VISVESVARAYA TECHNOLOGICAL UNIVERSITY
Belagavi-590018, Karnataka

A PROJECT REPORT

ON

VIRTUAL POLICE STATION AND SOS SYSTEM

Submitted in partial fulfillment of requirements for the award of degree of

Bachelor of Engineering

in

COMPUTER SCIENCE & ENGINEERING

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

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CERTIFICATE

This is to certify that the project work, entitled "**VIRTUAL POLICE STATION AND SOS SYSTEM"** is a bonafide work carried out by

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in partial fulfillment for the award of degree of Bachelor of Engineering in Computer Science & Engineering of the Visvesvaraya Technological University, Belagavi during the academic year 2021-22. It is certified that all the corrections/suggestions indicated for Internal Assessment have been incorporated in the report. The project report has been approved as it satisfies the academic requirements.

Signature of the Internal Guide	**Signature of HOD**	**Signature of Principal**
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DECLARATION

We, **Sahil Shaikh, Saurav Singh, Shabaz Mallick and Shibayan Bhattacharjee** hereby declare that the entire work titled "**VIRTUAL POLICE STATION AND SOS SYSTEM"** embodied in this project report has been carried out by us during the 8th semester of B. E degree at MVJCE, Bangalore under the esteemed guidance of **Mrs. Suguna S**, Assistant. Prof, Dept. of CSE, MVJCE affiliated to Visvesvaraya Technological University, Belagavi. The work embodied in this dissertation work is original and it has not been submitted in part of full for any other degree in any University.

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ABSTRACT

The application allows authenticated users to lodge a FIR in proper format, by collecting all the necessary and appropriate information related to the incident and convertingit into a word format which can be edited by the police personnel. A copy of successfully registered FIR will be shared to the complainant. The received FIR will be inspected by the police personnel, and will accordingly edit the FIR to fill in the information which is to be filled by the Police Personnel. The Police will have the authority to either accept or reject the FIR on the basis of the legitimacy of the FIR information. The complainant will be notified about the status of the FIR whether it is accepted or rejected. Also, the real time updates of the investigation process of that particular FIR will be displayed, and will be updated by the Police Personnel who are undertaking that investigation. The application will also provide advanced SOS System to ensure rapid action in Emergency Situations. By using this feature the user can reach out to the nearest Police Patrolling Vehicle through the Police Control Room. The Control Room will take action by informing the Patrolling Vehicle nearest to the location of SOS call.

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CHAPTER 1

INTRODUCTION

1.1 Project Overview

There is great amount of reluctance among people for writing FIR's as they hang back and find it hesitating as it could be a long hustling process. This leads to uninformed crimes and also encourages those criminals who are not reported. The police officials have been adopting the basic fundamental methods of carrying out the proceedings with the traditional "pen and paper" method being highly prevalent. But in today's India, it has become a very tedious task to manage the case and all its related documents, manually. Digitization in Police department is the need of the hour. The existing base papers have not been implemented practically. The conceived systems are theoretical. In many states there are different systems and approaches for tackling this issue. In Odisha, Naveen Patnaik has proposed the idea of implementing the virtual police system. Previously, Odisha had an ATM like system for reporting crimes. In Karnataka, there is a mobile application named Karnataka State Police Application which allowed people to view the reported crimes, find the nearest police station and other important functionalities. But, there is no implemented system which allows people to lodge a FIR online and get the feedback regarding the investigation. Hence, developing such an application will be beneficial to both the people and the Indian Police System. The application also provides the additional features like Requesting and Granting permission for protests, religious gatherings, events, concerts, and etcetera. This feature is effective in the current pandemic situation. The application also allows Employee and Tenant document verification. Implementing this application will be beneficial to the Indian Police System by digitizing the Traditional File Storage system and also encourages the Citizens to immediately inform any criminal activities.

1.2 Purpose of Project

The purpose of the project is to build an android application which helps users to file a complaint online by registering and providing the description of the incident through a designated form. This application also provides the police personal to verify and approve the FIR and provide constant feedback. It also provides location-based SOS tracking which has never been implemented before.

1.3 Scope of Project

We aim to eliminate the traditional method of registering a Police Complaint by Virtualization of the Police system, which will provide faster and efficient working of the Police. Also, the citizens who hang back themselves from reporting any incident or crime will also come forward by lodging FIR online, avoiding the exasperating traditional process of lodging an FIR. Reporting incident, crimes or any illegal activity is very important, because that is how such crimes and criminals will come under consideration and will help in prevention of such crimes in near future. Accurate violence detection is important for both the government and citizens and reducing the crime rate is crucial.

1.4 Problem Statement

People find it reluctant to go to Police Stations for writing FIR's as they hang back and find it hesitating as it could be a long hustling process. This leads to uninformed crimes and also encourages those criminals who are not reported. We intend to create an application to provide a solution to this problem were in people can file FIR's online and the process will be transparent and fair.

1.5 Existing System

Current system does not help the deaf people to communicate well. The existing systems provide the feature of reporting an incident (not FIR) after authenticating the user.

1.5.1 Disadvantages of Existing System

- Most of the existing base papers are not implemented. The conceived systems are theoretical.
- Feedback and real time updates of the report are not provided by the existing systems. It is more expensive.
- In recent times, considering the pandemic there is no feature to request and grant permission for gatherings, protests, events and concerts online.
- The SOS system proposed is only applicable for saved contacts

1.6 Proposed System

The proposed system consists of two modules:

➢ **User Module**

➢ **Admin Module**

• **User Module**:

➢ User have to register in the app, in order to lodge the FIR.

➢ After registering, user is authenticated using Aadhar card.

➢ An OTP is sent to the mobile no. registered with the Aadhar card.

➢ User can then use the application to lodge a FIR.

➢ User is provided with questions related to the FIR.

➢ After responding to the questionnaire, the FIR can then be converted in PDF format along with the signature of the user.

➢ The FIR lodging is completed after authentication using OTP.

• **Admin Module**:

➢ The FIR in the PDF format is received by the police personnel through the web portal.

➢ The FIR is then verified by the police personnel, upon verification the FIR is accepted.

➢ If the FIR is found to be faulty, it is rejected by the police personnel.

➢ The personnel will modify the FIR in step with the norms they follow.

➢ Real time frequent updates are provided to the complainant.

1.6.1 Objectives

The crime rate (crime incidence per 100,000 of population) in India was 383.8 in 2020 according to the National Crime Records Bureau, but many of the crimes aren't reported due to the consideration of the very long process which consumes a lot of time and is also a very hectic process. Also, In the current situation of the police system, maintaining of the records is the same old way of storing data in big fat files which is very hectic to maintain. Through our project we have proposed to develop a system which provides an easily accessible mobile application which forms the front end and a web portal for the police department. The complaints would be registered over the application. The complainant would be registering to the application then, complainant would be providing the details related to the incident over the application.

The user has to upload his/her signature after providing the details of the incident. These details would then be received by the police officials on the web portal in PDF format. They will verify the details of the complainant and carry out further proceedings of the case. The user can track the status of the FIR through the Application and once the FIR is accepted, the user can also be updated with the findings of investigation proceedings. Thus, the entire process of filing the FIR would be carried out online, without much manual intervention. Along with this we will also be including some added features like Requesting and granting permissions for events, protests and religious gatherings, Verification of employee details and an Advanced SOS System. A user can send a SOS signal to the Police control room using the advanced SOS system, the Control Room will track down the location of the SOS signal and will send an emergency message containing the location of the SOS signal to the nearby Patrolling vehicles.

Summary

This chapter gives an overview of project, its scope, existing system and its disadvantages, proposed system and objectives of proposed system.

CHAPTER 2

LITERATURE STUDY

2.1 Overview

Literature study is carried out to get all the related information of current project, which is used to get an idea for the enhancement as well as changes that can be made to improve existing approaches. A literature study is done on various models of Virtual Police Systems. Following section describes about all the related papers which is used in current project.

2.2 Related Papers

PAPER 1: ONLINE POLICE STATION

AUTHORS: Federico Neri, Paolo Geraci, Gianluca Sanna and Liviana Lotti.

• The authors wanted to describe a content enabling system that providing deep semantic search and information access to large quantities of distributed multimedia data for both experts and general public.

• The Focused Crawler is used to develop multimedia content and indexing system for managing collections of data from different distributed sources

• The Lexical System is used to identify relevant knowledge from a piece of text provided by the Crawling System

• Users search information using Natural language or by keywords.

• After developing the application, the outcome was more trust in system, more crimes reported, people got informed about different crimes and a social phenomenon was started.

PAPER 2: E-Police System- FIR Registration and Tracking through Android Application

AUTHORS: Archana Iyer, Prachi Kathale, Sagar Gathoo, Nikhil Surpam.

• This survey proposes to develop an android mobile application which consists of the front end and a web portal for the police department.

• The Application is written using Android SDK (software development kit) and uses Java programming language which provides complete access to the Android APIs.

• **Eclipse is used to create user interfaces, add Android Framework API based packages,** debugging options using SDK tools and export signed and unsigned .apk files.

• WAMP server is used to create web applications using Apache2, creating the dynamic web pages using PHP and creating the database using MYSQL.

• On creation of the users account the IMEI number of the phone is retrieved by the application and saved into the database.

• Application aims to help the public and police both. The updates of the case are notified to the user through the application. The ease of use and access of the android application helps in improving the state of law in the society.

PAPER 3: VPS – The Virtual Police Station 24*7 with Aadhar card Authentication

AUTHORS: Sanjukta Banerjee, Rohini Bale, Diksha Vazirani and Tanushree Shrivas Saloni Fating.

• This System proposes to develop an application which managing criminal records and allows user to add, update, remove and view the criminal database.

• The Application uses video, text, and other resources in different languages for coaching purpose.

• The Application is also integrated with social media to make it more interactive and easier to use.

• The web-based application allows authentication of the user and acts as an interface between the police and the complainant.

• Tools like VS Code and AWS are used to implement this application.

• The Application has two modules namely the user module and the admin module. If implemented efficiently it can be used both as a web application as well as mobile application. Hence, it can be accessed using any device having an internet connection.

2.3 Literature Study

The most of the literature survey focuses on the techniques to fetch data from twitter and news articles after which this data is converted into desired format and applied operations on to get the intent of the user. However, they have not focused on algorithm for classify the topic of the news tweets.

Summary

This chapter discuss about the literature study for the proposed system, related paper which gives idea of enhancements to the existing work. The related paper gives information about the existing systems, its advantages and disadvantages.

CHAPTER 3

SYSTEM REQUIREMENT

The system requirements specify features, components and behavior of system which is to be developed. The following sections describe about functional, non- functional, performance related, features and behavior of the solution. This includes the detailed description of the solution to be developed.

3.1 Functional Requirement

This section outlines all the functionalities with a number assigned to each.

Brief Description of the Functionality 1: (Name of Functionality)

The Reader accesses the Online Journal Website, searches for an article and downloads it to his/her machine.

Figure (Optional): Constraints:

One Reader can access only one journal at a time.

Sample Input: Sample Output: Brief Description of the Functionality 2:

The Reader accesses the Online Journal Website, searches for an article and downloads it to his/her machine.

Figure (Optional): Constraints:

One Reader can access only one journal at a time.

3.2 Non-functional Requirement

Non-functional requirements is not about functionality or behaviour of system, but rather are used to specify the capacity of a system. They are more related to properties of system such as quality, reliability and quick response time. Non- functional requirements come up via customer needs, because of budget, interoperability need such as software and hardware requirement, organizational policies or due to some external factors such as:-

- Basic Operational Requirement
- Organizational Requirement
- Product Requirement
- User Requirement

3.2.1 Basic Operational Requirement

The eight primary functions of systems engineering are all performed by the end users, which is the customers. Operational requirements which are given by:-

- **Mission profile or scenario:** It is a map which describes the procedures and leads us to the final goal/ objective. The goal of proposed system is, getting number of cluster for large dataset, selecting centroid and gives less computation time.
- **Performance:** It basically gives system parameters to reach our goal. Parameters for the proposed system are less computational time which is compared to the existing system.
- **Utilization environments:** It enlists the different permutations and combinations a system can be reused in many other applications which gives better cluster quality, as well as gives a new approach to clustering techniques.

3.2.2 Organizational Requirement

The Organizational requirement consists of the following types:

- **Process Standards:** To make sure the system is a quality product, IEEE standards have been used during system development.
- **Design Methods:** Design is an important step, on which all other steps in the engineering process are based on. It takes the project from a theoretical idea to an actual product. It gives us the basis of our solution. Because all the steps after designing are based on the design itself, this step affects the quality of the product andis a major player in how the testing and maintenance of a project take place and how successful they are.

3.2.3 User Requirement

- The user should able to have User Interface Window with Visualize Graphics.

The user should able to configure with neat GUI all the parameters.

3.3 Resource Requirement

- **Fire Base** evolved from Envolve, a prior startup founded by James Tamplin and Andrew Lee in 2011. Envolve provided developers an API that enables the integration of online chat functionality into their websites. After releasing the chat service, Tamplin and Lee found that it was being used to pass application data that were not chat messages. Developers were using Envolve to sync application data such as game state in real time across their users. Tamplin and Lee decided to separate the chat system and the real-time architecture that powered it. Firebase's first product was the Firebase Realtime Database, an API that synchronizes application data across iOS, Android, and Web devices, and stores it on Firebase's cloud. The product assists software developers in building real-time, collaborative applications.

- **Java** is a high-level, class-based, object-oriented programming language that is designed to have as few implementation dependencies as possible. It is a general-purpose programming language intended to let programmers write once, run anywhere (WORA), recompile meaning that compiled Java code can run on all platforms that support Java without the need to Java applications are typically compiled to bytecode that can run on any Java virtual machine (JVM) regardless of the underlying computer architecture. The syntax of Java is similar to C and C++, but has fewer low-level facilities than either of them. The Java runtime provides dynamic capabilities (such as reflection and runtime code modification) that are typically not available in traditional compiled languages. As of 2019, Java was one of the most popular programming languages in use according to GitHub, particularly for client–server web applications, with a reported 9 million developers. Java was originally developed by James Gosling at Sun Microsystems and released in May 1995 as a core component of Sun Microsystems' Java platform. The original and reference implementation Java compilers, virtual machines, and class libraries were originally released by Sun under proprietary licenses. As of May 2007, in compliance with the specifications of the Java Community Process, Sun had relicensed most of its Java technologies under the GPL-2.0-only license. Oracle offers its own Hot Spot Java Virtual Machine; however, the official reference implementation is the OpenJDK JVM which is free open-source software and used by most developers and is the default JVM for almost all Linux distributions.

- **Android Studio:** is the official integrated development environment (IDE) for Google's Android operating system, built on JetBrains' IntelliJ IDEA software and designed specifically for Android development. It is available for download on Windows, macOS and Linux based operating systems or as a subscription-based service in 2020. It is a replacement for the Eclipse Android Development Tools (E-ADT) as the primary IDE for native Android application development. to mines inspection, stitching maps on the web or through advanced robotics.

- **Visual Studio Code:** Visual Studio Code, also commonly referred to as VS Code, is a source-code editor made by Microsoft for Windows, Linux and macOS. Features include support for debugging, syntax highlighting, intelligent code completion, snippets, code refactoring, and embedded Git. Users can change the theme, keyboard shortcuts, preferences, and install extensions that add additional functionality. In the Stack Overflow 2021 Developer Survey, Visual Studio Code was ranked the most popular developer environment tool, with 70% of 82,000 respondents reporting that they use it.

3.4 Hardware Requirement

The following is the hardware requirements of the system for the proposed system:

Processors	:	Pentium IV 2.4 GHz
RAM	:	8 GB SSD
Storage	:	40 GB
Standard Devices	:	Keyboard, monitor and mouse

3.5 Software Requirements

The following is the software requirements of the system for the proposed system:

Platform	:	Windows 10 onwards.
Language	:	Java.
Software	:	Fire Base.
Tool	:	Android Studio, Visual Studio Code.

Summary

The chapter describes about functional, non-functional, resource, hardware and software requirement of system

CHAPTER 4

SYSTEM ANALYSIS

Analysis is nothing but finding solution to various problems. System analysis is defined as, process in which we get the information about the existing problems, requirements and to solve various problems related to system. Study of feasibility plays vital role in system analysis, which helps in providing goals for development and design

4.1.1 FINANCIAL

Financial feasibility is one of key factor of feasibility analysis, which is carried out to scrutinize economic cost of organization, limited fund is endowed by companies for development of system. Hence, the developed project cost is within budget, because of freely available resources and can be accessed by open-source.

4.1.2 TECHNICAL

Technical feasibility is entailed to scrutinize technical performance of system. System which is building should have less demand. Hence, this gives number high of demands asked by the clients. The proposed system is built in such way that there is no harm for the user as well the MR-SGSO executes very well. The project draws all the technical requirements from open source and resources are used which have higher execution time.

Summary

The objective of this chapter is to know the proposed system is feasible or not. The chapter mainly describe about the various keys of feasibility analysis i.e. financial, technical and public.

CHAPTER 5

SYSTEM DESIGN

Design is an innovative procedure; a successful system is developed through great designs. System design is a process of giving detailed information about the proposed work in a physical format. Different designs are built for development of system, which describes about features, components which are included and how client interact with system.

5.1 Fundamental Design Concepts

Fundamental design is developed in course of recent years. As year's passes, enthusiasm of creating new designs is evolved and each design has been tested. Software designer gets new ideas and foundation to build and test new design concepts. Fundamental framework is design to "getting it right". Major plan ideas, for example, deliberation, refinement, modularity, programming engineering and data encryption is applied to meet the requirement of proposed work.

5.1.1 Input Design

Input Design is a way toward changing user-based inputs into computerized format. Main objective of input design is, to make computerization as possible and error free. Giving a decent information configuration to the application simple information and determination highlights are received. The input design prerequisites, for example, ease of use, reliable organization and intelligent exchange to help client to get proper information on time. Input design is a general framework which exceptionally cautious consideration. Gathering all input parts is one of the costly parts of framework.

5.1.2 Output Design

Output design meets the necessities of client and presents the output data clearly. In any framework processing result are conveyed to clients and different frameworks in form of output design. It is direct source to client. Productive output enhances framework association with machines of source and destination.

5.2 Development of System

Development of system is a method, where development of product is completed or it solves all problems of system. Development of software includes number of stages and process to develop software. Step by step procedure is followed to complete development of software. The method which is followed in this project is incremental model.

5.2.1 Different phases of model

- **Requirement:** This phase includes collection of all requirements which is needed for development of software.
- **Design:** The specification of system is converted into software design, by keeping in mind system specification. The designer mainly describes about algorithm, architecture and structure of system.
- **Coding:** Developer begins coding with a specific end goal to give a full outline of project. As such framework system specification are just changed over into system decipherable process code.
- **Implementation:** This stage includes execution of project which involves coding. The output is commonly a library, documentation and client manuals.
- **Testing:** The testing stage includes all modules of project which is coordinated and tried to guarantee that total framework meets product necessities. Verification and Validation is mostly concerned under this testing phase.
- **Maintenance:** It is most important stage, where product should be user friendly, adaptable, error free and should improve productivity of project.

5.2.2 Purpose of choosing Increment model

Incremental Model is a process of software development where requirements are broken down into multiple standalone modules of software development cycle. Incremental development is done in steps from analysis design, implementation, testing/verification, maintenance.

Characteristics of an Incremental module includes

- System development is broken down into many mini development projects
- Partial systems are successively built to produce a final total system
- Highest priority requirement is tackled first
- Once the requirement is developed, requirement for that increment are frozen

When to use Incremental models?

- Requirements of the system are clearly understood
- When demand for an early release of a product arises
- When software engineering team are not very well skilled or trained
- When high-risk features and goals are involved

Such methodology is more in use for web application and product based companies

5.3System Architecture

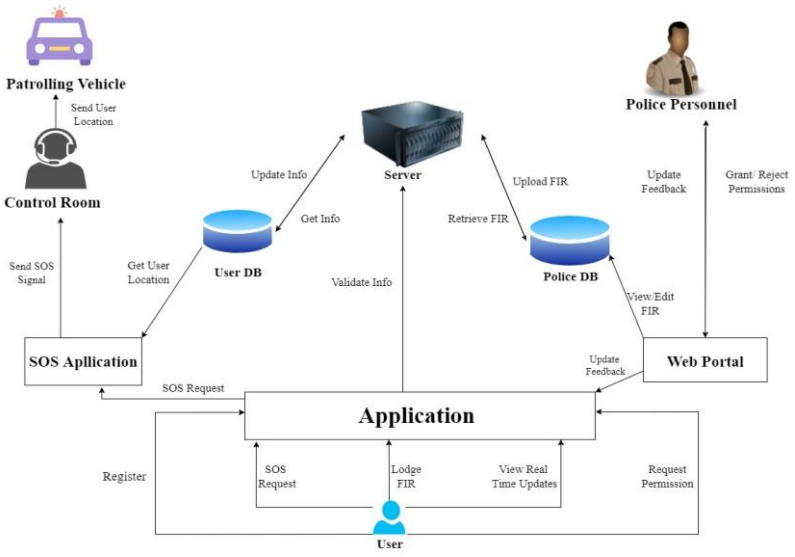

Fig 5.3: Proposed System Architecture

Summary

This chapter mainly concentrates on input design, output design, waterfall model, system architecture and various designs which is involved in proposed system.

CHAPTER 6

IMPLEMENTATION

It is main part of project where project is implemented. Implementation must be clearly defined, planned carefully and systematically otherwise it causes confusion and leads to generation of problems. Following tasks involved in stage of implementation:

Login Module:

1. Option for Sign-up or Login using Mobile phone or username and Password.
2. Authentication using OTP to registered Mobile No or Email Id.
3. User Information, such as Name, Mobile, Address, Aadhar Card, etc.
4. Option to Edit Information after verification Through OTP.
5. Forgot Password/Recovery through OTP

FIR Module:

- A Full-Fledged form with necessary Input Fields, Drop downs, according to the FIR Format FIR format should be the same as that of offline.
- On Successfully Lodging the FIR, it should be saved in database and visible in Police personnel's Portal.
- Police personnel can Edit the FIR as per he/she wishes.
- Police personnel should have option to accept or reject the FIR.
- Real-time Updates should be shown to the User's describing the status of the FIR, i.e., Received, In-process, Verifying, Verified, Accepted, Rejected.
- The user can Download the PDF file of the FIR if it is successfully accepted and case-Id is generated for the same.

Case Proceeding Module:

- A higher Authority login Should be provided.
- The higher Authority can look into the case assigned and the information related to that case
- Real-time updates of the Case proceedings should be provided which will be updated by thehigher authority and visible to the user.
- Status of the Case (Ongoing or closed) should be associated with each case and the Final verdictwhen the case is closed.

SOS/ Emergency System Module:

- Option to send SOS Signal in the Android app.
- User can add emergency contacts for the SOS system after signing up in the VPS application.
- In emergency situations, user can use the SOS feature by clicking the SOS button.
- On clicking the SOS button, the app will connect to the emergency contact number viaMessaging or Calling.
- Current location is also shared to the police's portal.
- The emergency contact numbers can be replaced or edited.

Summary

The chapter describes about implementation process of proposed system. It describes about which platform, language, algorithms and processing techniques used for executing the project.

CHAPTER 7

TESTING

Testing is an important part of project where testing of each module is done. Testing guarantees that proposed system is well organized analyzed to meet requireproject goal. Testing is last stage of project which guarantees the system is error free and ready to give desired output. The goals of testing are given by:

- Give operational quality to system
- Search and remove errors.
- Best quality project is produced.
- To approve the product as a solution for the first issue.

The following are types of testing performed in proposed system.

7.1 Unit Testing

Each module of project is tested individually. Verification is done on each module. Module of project is tested individually. Testing is done in programming style. The unit testing for the proposed system is performed on initialization, Data collection, Genre classification, visualizing the output.

7.2 Integration

After unit testing is performed, integration testing takes place in each module of project. Integration is done on various classes of system. It is done on front and back end also.

- **Function into classes Integration**

  Initially during code phase various functions is developed for development of system. Each function of system is tested and coded individually. As all the functions are verified they are mixed into their particular classes.

- **Distinct classes Integration**

  Based on functionality, testing of distinct classes is done independently. Verification of each class is done which gives good result and hence integration is performed again on different classes.

7.3 Integration Testing

Developing a programming framework is a sophisticated technique which is used by Integration testing. It solves various issues on dual verification problem and construct program which solves all related problems. Main objective of integration testing is to construct a program structure based on unit testing modules.

As modules of software are divided, testing is performed on each module. Later this separated module is tested as whole set. Here, to rectify errors is difficult as it has different isolated errors.

7.3.1 Up down Integration

The up down integration deals with development of program framework in incremental way. Modules of each program are coordinated in descending order and it starts with primary module. This method is an incremental approach to the construction of program structure. Modules are integrated by moving downward, beginning with the main program module. Modules that subordinates to the main program module are incorporated into the structure in either a depth first or breadth first manner.

7.3.2. Bottom-up Integration

The below table integrated testing table is divided into integrated classes, functions of each classes, how test is performed and result generated. This method begins the construction and testing with the modules at the lowest level in the program structure. Since the modules are integrated from bottom to up, processing required for modules subordinate to a given level is always available. Therefore in this case the need for stubsis eliminated. It is important to check whether the testing is error free or not for different classes.

7.4 Validation Testing

As completion of testing combination is done, writing computer program is put together in on package. Testing approval is described from various perspectives. Hence testing affirms items limits which are sensibly expect.

7.5 User Acceptance Testing:

Key factor for success of any system is user acceptance. User acceptance testing is performed on users, show which will be successful based on user motivation and knowledge. At time of developing and making required changes, system under consideration along with prospective system, users undergoes constant testing. The changes are made regarding to 3 points

- Input design
- Output design

7.5.1 Black Box testing

Functional testing is considered as Black box testing and it mainly focus on functional requirements. It is a software technique where the tester could not predict the testing of internal workings. Programming code is not examined by the tester and they need not to have further knowledge of the programming other than its specifications. It is a complementary approach uncovering distinct classes of errors which are:

- Error in performance
- Initialization and termination errors
- Missing function
- Errors in interfaces
- Errors in objects

Advantages of black box testing:

- Test are unbiased
- Programming knowledge is not required.
- Based on user point of view test is conducted.
- Cases are built after completion of specifications.

7.6 Test Data Preparation

In system testing, test data preparation plays a main role. Test data is prepared and is used to test the system under study where errors are hidden and removes by using following testing steps for better future use.

7.6.1 Testing Artificial Data

Artificial data is created for testing purpose. All combinations of formats and values are tested by generating the artificial test data. Data generating utility program in system information departments helps to prepare artificial data as quickly as possible. It is made possible to test all control paths, login through program.

7.7 Assurance of Quality

Quality assurance is testing and analysis of administration element. The main objective is to give knowledge about item quality to administration. Assurance of quality involves:

7.7.1 Quality Factors

The main goal of confirmation value is track product quality and observes procedures to enhance programming.

Quality factors are described in following two categories:

- Directly measured factors.
- Indirectly measured factors.

Quality factors mainly focus on following three things:

- Operational attributes
- Experiences capacity changes
- Versatility.
- Effectiveness
- Time duration.

7.7.2 General Risks

Risk is nothing but which gives negative results at undesirable incident. The following three things are considered to recognize risk in other projects:

- Damage occurs during an occasion.
- Probability of occurring an occasion.
- The result that modified at certain level.

7.7.3 Security Technologies & Policies

The seven major activities the software quality is comprised of which are follows:

- Conduct of formal specialized audits
- Measurement
- Testing Software
- Application for specialized techniques.
- Control of progress
- Record keeping and announcing
- Enforcement of measures

Summary

The chapter describes about various testing techniques such as unit testing, integration testing, validation testing, output testing and etc.

CHAPTER 8

RESULTS

8.1 EXPECTED OUTCOME

The outcome expected is to have an Application which will provide majority of the features of a police station to its users and will create a bridge between the citizen and the police by virtualization of the process of the Police System. This will offer more flexibility and transparency to the citizen who is seeking the police assist and will provide an efficient working environment to the police personnel.

8.3 CHALLENGES FACED

There were many challenges faced by us during the project. The biggest challenge was to implement the SOS system with real time location tracking. It was hard to find the most suitable API to use for real time tracking.

8.4 CODE

```
9   package com.example.complaint;
10
11  import androidx.annotation.NonNull;
12  import androidx.appcompat.app.AppCompatActivity;
13
14  import android.os.AsyncTask;
15  import android.os.Bundle;
16  import android.widget.Toast;
17
18  import com.github.barteksc.pdfviewer.PDFView;
19  import com.google.firebase.database.DataSnapshot;
20  import com.google.firebase.database.DatabaseError;
21  import com.google.firebase.database.DatabaseReference;
22  import com.google.firebase.database.FirebaseDatabase;
23  import com.google.firebase.database.ValueEventListener;
24
25  import java.io.BufferedInputStream;
26  import java.io.IOException;
27  import java.io.InputStream;
28  import java.net.HttpURLConnection;
29  import java.net.URL;
30
31  public class DownloadPdf extends AppCompatActivity {// creating a variable
    for our Firebase Database.
32      FirebaseDatabase firebaseDatabase;
33
34      // creating a variable for our Database
35      // Reference for Firebase.
```

```
36      DatabaseReference databaseReference;
37
38      // creating a variable for our pdfview
39      private PDFView pdfView;
40
41      @Override
42      protected void onCreate(Bundle savedInstanceState) {
43          super.onCreate(savedInstanceState);
44          setContentView(R.layout.activity_download_pdf);
45
46          // initializing variable for pdf view.
47          pdfView = findViewById(R.id.pdfView);
48
49          // below line is used to get the instance
50          // of our Firebase database.
51          firebaseDatabase = FirebaseDatabase.getInstance();
52
53          // below line is used to get reference for our database.
54          databaseReference = firebaseDatabase.getReference("url");
55
56          // calling method to initialize
57          // our PDF view.
58          initializePDFView();
59      }
60
61      private void initializePDFView() {
62          // calling add value event listener method
63          // for getting the values from database.
64          databaseReference.addValueEventListener(new ValueEventListener() {
65              @Override
66              public void onDataChange(@NonNull DataSnapshot snapshot) {
67                  // this method is call to get the realtime updates in the
    data.
68                  // this method is called when the data is changed in our
    Firebase console.
69                  // below line is for getting the data from snapshot of our
    database.
70                  String pdfUrl = snapshot.getValue(String.class);
71
72                  // after getting the value for our Pdf url we are
73                  // passing that value to our RetrivePdfFromFirebase
74                  // class which will load our PDF file.
75                  new RetrivedPdffromFirebase().execute(pdfUrl);
76              }
77
78              @Override
79              public void onCancelled(@NonNull DatabaseError error) {
80                  // calling on cancelled method when we receive
81                  // any error or we are not able to get the data.
82                  Toast.makeText(DownloadPdf.this, "Fail to get PDF url.",
    Toast.LENGTH_SHORT).show();
```

```
            }
        });
    }
    class RetrivedPdffromFirebase extends AsyncTask<String, Void, InputStream> {
        // we are calling async task and performing
        // this task to load pdf in background.
        @Override
        protected InputStream doInBackground(String... strings) {
            // below line is for declaring
            // our input stream.
            InputStream pdfStream = null;
            try {
                // creating a new URL and passing
                // our string in it.
                URL url = new URL(strings[0]);

                // creating a new http url connection and calling open
                // connection method to open http url connection.
                HttpURLConnection httpURLConnection = (HttpURLConnection) url.openConnection();
                if (httpURLConnection.getResponseCode() == 200) {
                    // if the connection is successful then
                    // we are getting response code as 200.
                    // after the connection is successful
                    // we are passing our pdf file from url
                    // in our pdfstream.
                    pdfStream = new BufferedInputStream(httpURLConnection.getInputStream());
                }

            } catch (IOException e) {
                // this method is
                // called to handle errors.
                return null;
            }
            // returning our stream
            // of PDF file.
            return pdfStream;
        }

        @Override
        protected void onPostExecute(InputStream inputStream) {
            // after loading stream we are setting
            // the pdf in your pdf view.
            pdfView.fromStream(inputStream).load();
        }
    }
}
```

8.5 FINAL OUTPUT

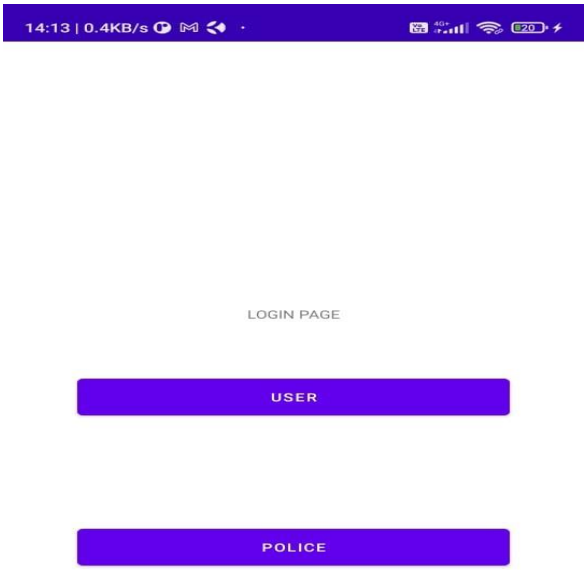

Fig 8.5.1: Login Page

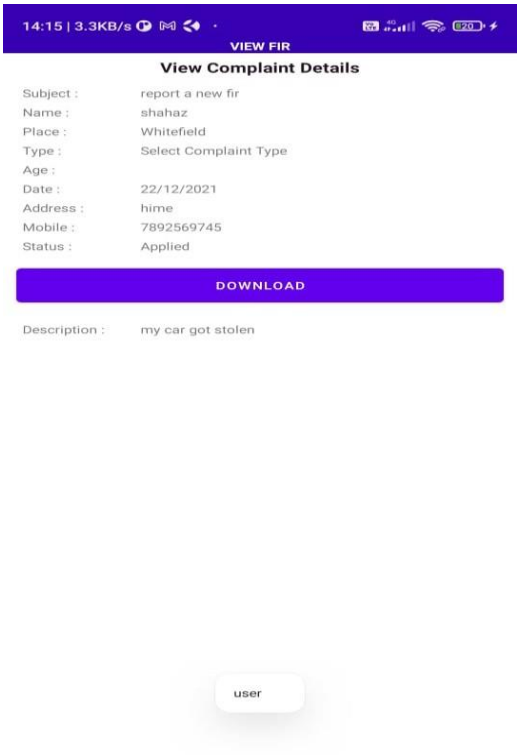

Fig 8.5.2: Complaint details

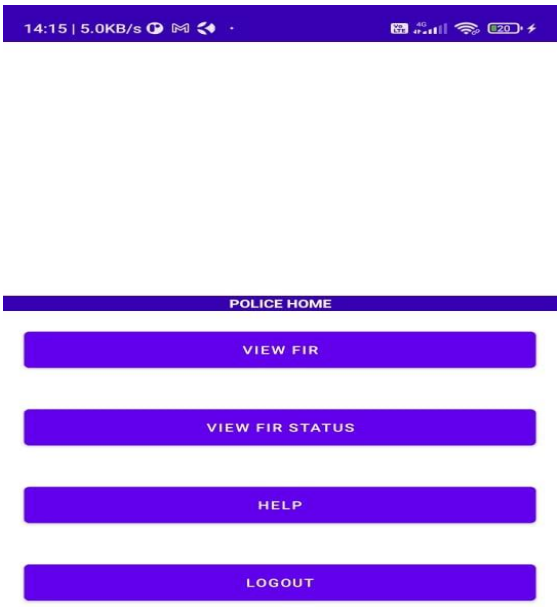

Fig 8.5.3: Police Home Page

Summary

The chapter describes about various screenshot of results, step by step process to execute proposed project and advantages of proposed system.

CONCLUSION

Predicting crimes before they happen is simple to understand, but it takes a lot more than understanding the concept to make it a reality. Although police do include the use of new technologies such as Sting Rays and facial recognition every few years, the implementation of such software can fundamentally change the way police work, in a much better way. This application outlined a framework envisaging how the aspects of machine and deep learning, along with computer vision, can help create a system that is much more helpful to the police. Our proposed system has a collection of technologies that will perform everything from monitoring crime hotspots to recognizing people from their voice notes.

Future scope

- We look to additional features like viewing the accident history of a car, Police verification, seeing nearby police stations etc.
- We are looking to advance the authentication system and improve the user Interface.

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