DAYANANDA SAGAR UNIVERSITY

KUDLU GATE, BANGALORE – 560068

Bachelor of Technology
in
COMPUTER SCIENCE AND ENGINEERING

Major Project Phase - II Report

WOMEN SAFETY MANAGEMENT SYSTEM

By

Mohammed Taheer - ENG19CS0186
Mourya B D - ENG19CS0188
N Shaik Safi - ENG19CS0195
Prarthan P - ENG19CS0228

Batch No.: **07**

Under the supervision of

Prof. Amruta B
Assistant Professor, Department of CSE

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING,
SCHOOL OF ENGINEERING
DAYANANDA SAGAR UNIVERSITY,

(2022 - 2023)

DAYANANDA SAGAR UNIVERSITY

School of Engineering
Department of Computer Science & Engineering
Kudlu Gate, Bangalore – 560068
Karnataka, India

CERTIFICATE

This is to certify that the Phase-II project work titled **"WOMEN SAFETY MANAGEMENT SYSTEM"** is carried out by **Mohammed Taheer (ENG19CS0186)**, **Mourya B D (ENG19CS0188)**, **N Shaik Safi (ENG19CS0195)**, **Prarthan P (ENG19CS0228)**, a bonafide students of Bachelor of Technology in Computer Science and Engineering at the School of Engineering, Dayananda Sagar University, Bangalore in partial fulfillment for the award of degree in Bachelor of Technology in Computer Science and Engineering, during the year **2022-2023**.

Prof. Amruta B	**Dr Girisha G S**	**Dr. Udaya Kumar Reddy K R**
Assistant Professor Dept. of CS&E, School of Engineering Dayananda Sagar University	Chairman CSE School of Engineering Dayananda Sagar University	Dean School of Engineering Dayananda Sagar University
Date:	Date:	Date:

Name of the Examiner **Signature of Examiner**

1.

2.

DECLARATION

We **Mohammed Taheer (ENG19CS0186)**, **Mourya B D (ENG19CS0188)**, **N Shaik Safi (ENG19CS0195)**, **Prarthan P (ENG19CS0228)** are students of eight semester B.Tech in **Computer Science and Engineering**, at School of Engineering, **Dayananda Sagar University**, hereby declare that the Major Project Stage-II titled **"WOMEN SAFETY MANAGEMENT SYSTEM"** has been carried out by us and submitted in partial fulfilment for the award of degree in **Bachelor of Technology in Computer Science and Engineering** during the academic year **2022-2023**.

Student **Signature**

Name1: Mohammed Taheer

USN : ENG19CS0186

Name2: Mourya B D

USN : ENG19CS0188

Name3: N Shaik Safi

USN : ENG19CS0195

Name4: Prarthan P

USN : ENG19CS0228

Place : Bangalore

Date :

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We would like to thank our guide ***Amruta B****,* ***Assistant Professor****,* ***Dept. of Computer Science and Engineering****,* ***Dayananda Sagar University****, for sparing her valuable time to extend help in every step of our project work, which paved the way for smooth progress and fruitful culmination of the project.*

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TABLE OF CONTENTS

Page No.

LIST OF ABBREVIATIONS

SMS	Short Message Service
GPS	Global Positioning System
GeoURI	Uniform Resource Identifier for Geographic Locations
SOS	Save Our Soul

LIST OF FIGURES

LIST OF FIGURES

LIST OF TABLES

ABSTRACT

In many countries as well as in India the safety of women in public areas or outside their homes is heavily being questioned in recent times. Every day we see many cases of women getting harassed, assaulted, robbed, or getting stalked by strangers in their workplace, schools and colleges, public transport, parks, malls, and in many other places. So we chose this project to give women the confidence to go out in society freely and happily without being worried about their safety. We propose to build an application for women. This application will have many different features to help women when they are in danger, which can/will lead to immediate help or rescue from the situation. During an emergency by using the proposed mobile application women can send SMS with geolocation, which will be sent to the registered guardian/parent when they press the panic button. And immediate help can be given to prevent women from danger. Also helpline services like hospital/ambulance and police station will also be provided for quick access. These would be some of the basic functions provided by the application. We are aiming to work with geofencing technology to get alerts in case a woman's kidnapping takes place or the woman goes out of a particular zone.

CHAPTER 1

INTRODUCTION

CHAPTER 1 INTRODUCTION

As a consequence of decades of civil society action, aided by women's groups, gender-based violence has become a significant issue on both a national and international scale. Even though the country has various laws and regulations to protect women from assault, abuse, and other types of violence, enforcing it has been a major challenge, and as a result women experience injustice. To protect women from these oppressions technologies can be effective.

The increased violence can lead to restrictions on the fulfillment of education for women. It will have led to hindrance in earnings possibility and hence affect the society and also the economy. In addition to making up half of the population and having equal rights to men, women also participate equally in development. This argument, that women are not just one step ahead of males in the current day, cannot be refuted. Without using generalizations, one cannot imagine women.

1.1. ABOUT THE PROJECT

The project is to build a mobile application. This application will help in getting immediate help from guardians/parents with just a few clicks by sending an SMS regarding the issue with their location details like latitude and longitude. Also, the user (women) can get quick access to the necessary helpline services details like hospitals/ambulances and police stations. A geolocation package would be used for getting the geolocation. SMS package would be used for sending the SMS. The front end for mobile applications is being done using Java. We are using MySQL database, and tomcat server and we are building a web application as well which will be integrated with a mobile application and act as a backend. Women do not need to carry a separate device for safety as they carry mobile phones every time and everywhere and this application would come to their aid every time they feel unsafe.

1.2. DATA OF CRIME AGAINST WOMEN IN INDIA

According to the most recent data from the National Crime Records Bureau (NCRB), crime against women increased by 15.3% in 2021 compared to a year earlier, and the incidence of such crimes per 1 lakh people increased by 8% in India. According to the data, there were 4,28,278 total incidents of crime against women reported in 2021, up from 3,71,503 cases the previous year, representing an increase of 56,775 cases over the course of the year. The research also reveals an increase in the rate of crime against women, or the number of incidences per 1 lakh people, from 56.5% in 2020 to 64.5% in 2021.

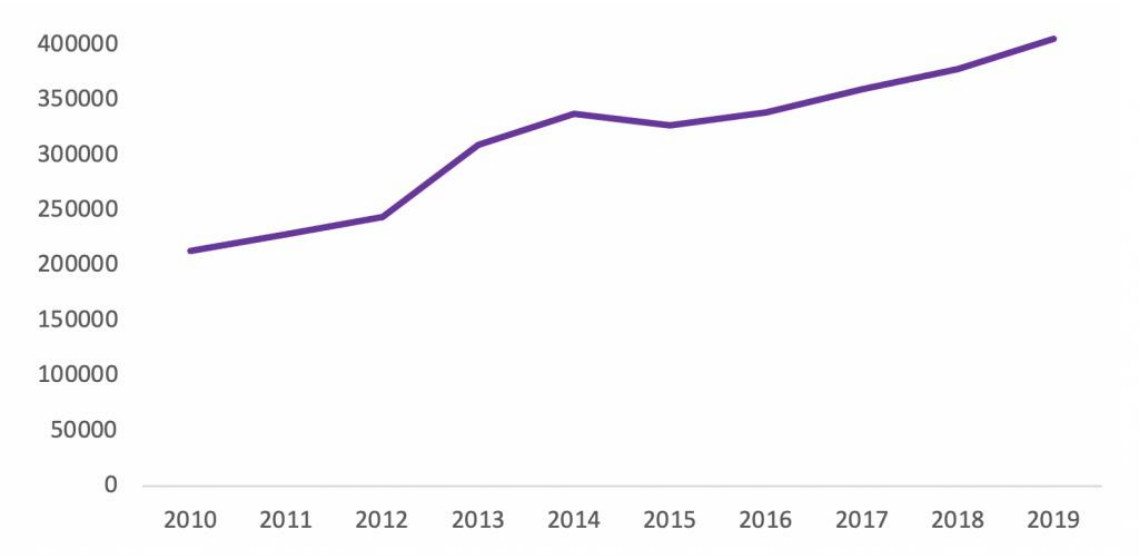

Figure No.: 1.2 Crime against women: 2010-2019(NCRB)

Table 1.2: Crime against women in India

Sl.No.	Figure	Description	Source
1	1.1	Crime against women:2010-2019	National Crime Records Bureau(NCRB)

1.3. SCOPE

In the proposed project, users will be women, guardians/parents, and friends. Giving women most of the necessary and quick access to various features in times of crisis or danger is the main scope of this project. The deliverable will be an application that runs on the necessary resource, which is a mobile phone with an Android operating system.

When a woman feels that she is in danger, she will press the panic button on the mobile, which will send the woman's geolocation coordinates to her emergency contacts stating that she is in danger, and also a call will also be made. Furthermore, the inclusion of a haversine formula for Geofencing would give women security in a virtual area, by creating a virtual boundary for a preferred amount of time, and then if the women go out of the boundary before that preset time, then an alert will be sent to the emergency contacts stating that she is out of her preferred zone.

The proposed project has a positive societal and environmental impact. If women feel safe to go out in society then they can make progress and developments in various aspects. Working women can be economically effective in society. And also they will bring various morals and values into organizations. By using the proposed application, women who are in dangerous situations can notify their location of her guardians and can be rescued by their guardians as well as using the help of the authority. Many lives can be saved which impacts the environment. The novelty of the idea is to use geofencing technology to provide safety to women.

CHAPTER 2
PROBLEM DEFINITION

CHAPTER 2 PROBLEM DEFINITION

Unfortunately, the safety of women is in doubt and security is not a concern. Many incidents are still coming across against women indicating that increasing trends such as harassment, abuse, and rape still happening in today's generation. Around 80% of women are losing confidence and have fear of the realization of freedom.

Women face many dangers in society. In these circumstances, some women could freeze or fail to respond quickly. They require an active, round-the-clock support system since they could encounter danger at any time.

In order to provide the solution to the above-stated problem a mobile application is built. This mobile application is very much helpful for anyone. This application helps a woman who is in a distressed situation to inform them about the situation to their guardian with an alert message and user location using latitude and longitude fetched from the user through GPS, and also user can access helpline services details like ambulance and police stations within the application. The application will also have a geofencing feature which will come to aid in times of kidnapping situations.

CHAPTER 3
LITERATURE REVIEW

CHAPTER 3 LITERATURE SURVEY

Shubham Nikam et al [1] proposed an app that is a simple way for a lady in a crisis to make an emergency call. All users should double-press the phone's volume button. An emergency message with her GPS coordinates and pre-selected emergency contacts is promptly and automatically sent to the police, followed by a call to a specialized police helpline and the camera and voice recording begin. If it cannot be easily delivered, no user intervention is necessary. At their station, the police receive an audio alert, photographs, and the location of the crisis is plotted on a Google Maps interface.

Prof. Kishore Sakure et al [2] proposed creating an application to develop and implement a women's safety system. According to the objectives, a location-tracking subsystem was successfully completed, and the relevant findings were presented. The system will be expanded in accordance with the future scope's aims. The report also goes over GPS technology, which may be used to track the victim's location using latitudes and longitudes.

Aarati Patil et al [3] The effort that author's put into this work is to design and develop an Android application that can be used to promote the use of the personal security system. Most of the fundamental problems faced by women will be addressed by this arrangement, which will also increase their sense of security. The proposal component grants the shaking sensor-based application access and locates the user's location in terms of longitude and scope so that they can be followed using Google maps. This paradigm reduces the rate of violence against women. In the present context, women's security is a fundamental problem. With the aid of ongoing use of our suggested framework, these infractions can be resolved.

Dr.V.Suganya [4] laid out the detailed information of the geofencing technology.A geofence configuration can cause push notifications on mobile devices, SMS messages or alerts, targeted social media adverts, tracking of vehicle fleets, the disabling of particular technologies, or the delivery of location-based marketing data.The author explained

various applications and fields where geofencing technology can be used, one such is for providing safety and security to women.

Quazi Maliha et al [5] Here the author of this study introduced the Android software GoFearless, which focuses on women's safety. This program makes it easier for social media groups and emergency contacts to track the victim's whereabouts in real-time. One of the distinctive characteristics of this program is the availability of numerous sharing options in three different link types, including GeoURI, OpenStreetMap, and Google Maps. Simply shaking the device activates the panic signal, which has a high pitch. It can also be manually activated by tapping. The user can choose options in the settings, such as having the panic alarm recur even if the app is closed until the user turns it off when they feel safe.

Shilpa G et al [6] recommended the development of an application for the well-being of girls and women. It lends a helping hand to women at risk or in danger, and it may give an extra benefit to women who venture outside regardless of the hour. The problem of women's safety is increasing rapidly in this environment, so they proposed an effective Android application to prevent such forms of suspicious or natural disaster, by alerting the authorities using the android mobile phone, which helps to stop such forms of illegal activities and to trace the concern.

Raju Potharaju et al [7] developed a hybrid/cross-platform mobile application. Using Flutter, the application was made (Dart Language). The program's fundamental features will include sending a report to pre-registered emergency contacts that includes the user's current position, a picture of the immediate area, and a voice recording. The application may be activated via a physical button. The flutter framework was used to create the application's user interface, which also incorporates authentication and a connection to the Firebase database. It works as intended for the function that sends registered emergency contacts to the user's current geolocation, surrounding photos taken with the back camera, and voice recordings. In the future, it will be implemented to use Aadhaar authentication, activate applications using hardware buttons, and alert the police portal.

Nehal Chourasia et al [8] The topic of geofencing is covered in this article. It introduces numerous ground transportation applications as well as primary geofencing-based control and monitoring technologies. Finally, satellite navigation services should be useful for upcoming geofencing-based applications. It is anticipated that there will be significant advancements in positioning accuracy, and these systems will result in more effective geofencing applications by offering integrity mechanisms with higher mobile positioning accuracy and confidence.

Mr. Kalyan D Bamane et al [9] built an Android app to protect girls. We can use this application if we believe that we are in an emergency circumstance, such as when we are driving alone or in a cab at night. so that we may instantly communicate our whereabouts to any police station and family members. Therefore, after clicking the button, messages with the most recent locations are sent to all parties with permission, enabling us to thwart any upcoming crimes. Therefore, this mobile application has safety and security features that require the engineering code of conduct, which is crucial in today's society. This mobile application will be helpful in the future when issues with travel or other scenarios emerge.

Prof Rajesh Nasare et al [10] developed a mobile application. This Application is built to reduce the cases happening in society against women. This SWMS application offers a crucial capability to request emergency assistance. Women who use this app will receive notifications regarding uncharted territory. so that she would be prepared for any circumstance from the start. The application uses machine learning, and an SVM algorithm to identify whether a place is crime prone or not.

Vinay et al [11] The goal of the author's work is to plan and develop an Android application that can be used to promote the use of personal security systems. This setup will take care of a lot of the basic problems faced by women and make them feel comfortable.

The proposal component enables voice-based application access and determines the individual's location in terms of longitude and range, which may be tracked using Google maps. This system reduces the rate of violence against women. A fundamental problem

in the present day is the security of women. When our suggested framework is consistently used, these violations may be resolved.

Pragna B R et al [12] Here, the authors put out a creative notion for making the gadget simple enough for women in remote areas to use. When a threat arises, a certain button can be pressed on the device's two or three colored buttons, which have been programmed with the essential and appropriate functions. The suggested device contains four colored buttons—red, blue, green, and yellow—as can be seen. The red button activates the alarm sensor, the blue button notifies the pre-programmed contacts of an emergency, the green button records audio, and the yellow button aids in the detection of hidden cameras when it is pressed.

CHAPTER 4
PROJECT DESCRIPTION

CHAPTER 4 PROJECT DESCRIPTION

Women using the proposed mobile application will be able to do an alert message to the registered guardian/parent number with their geolocation will be sent just by pressing the panic button.

An additional geofencing technique will be used to alert when the woman is out of a particular zone that the woman has set, which could help in the time when the victim is being kidnapped.

This project is being done in order to better target areas of increased risk for women facing many dangers in a society like harassment, assault, and robbery, and removing the barriers of an unsafe environment can help women fulfill their potential as individuals and as contributors to work, communities, and economies.

The deliverable will be an application that runs on the necessary resource, which is a mobile application with an android operating system. Furthermore, the inclusion of Geofencing would give women security in particular areas.

This project will benefit women and girls in terms of safety and security. It helps women be calmer, more understanding, gain body and mind control, be more responsive than reactive, be more observant, and achieve cognitive awareness.

4.1 SYSTEM DESIGN

4.1.1 SYSTEM ARCHITECTURE

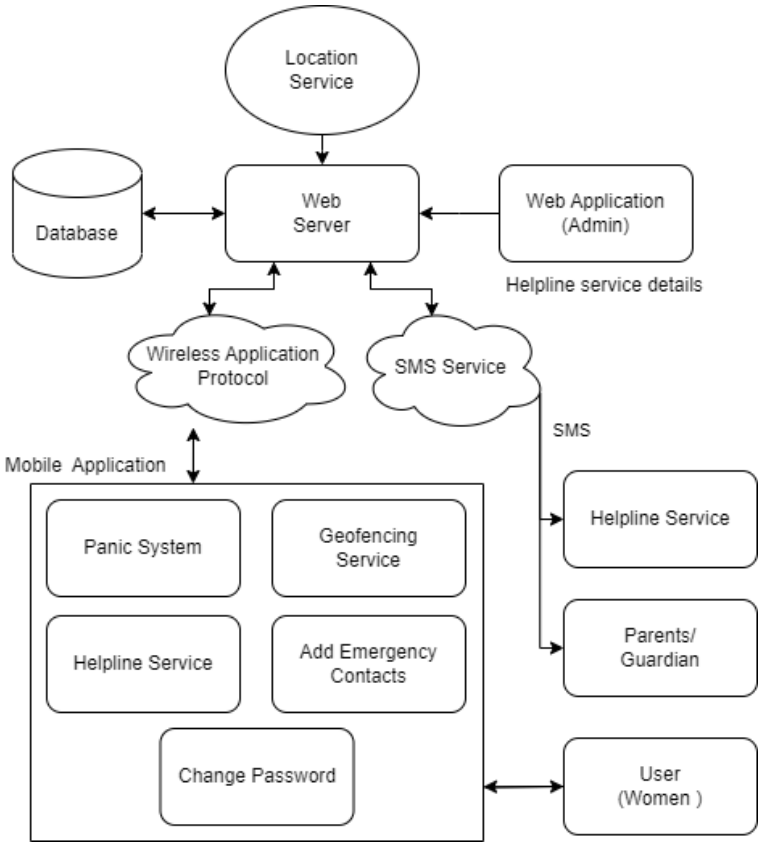

Figure No.: 4.1.1 System Architecture

The Figure No.: 4.1.1 represents the system architecture design for the proposed project. This design will act as the skeletal structure for developing the application. The main components of the system architecture are our mobile application, web application, and database. It gives us a view of the structure of the project. To access the functions offered by the application,location service must be enabled. We are using WAP to connect the web server with a mobile application. And we are using SMS service for sending the alert message and also in times when helpline service will be used. Here the user (woman) will access the mobile application. The web application will be used by the admin.

4.1.2 DATA FLOW DIAGRAM

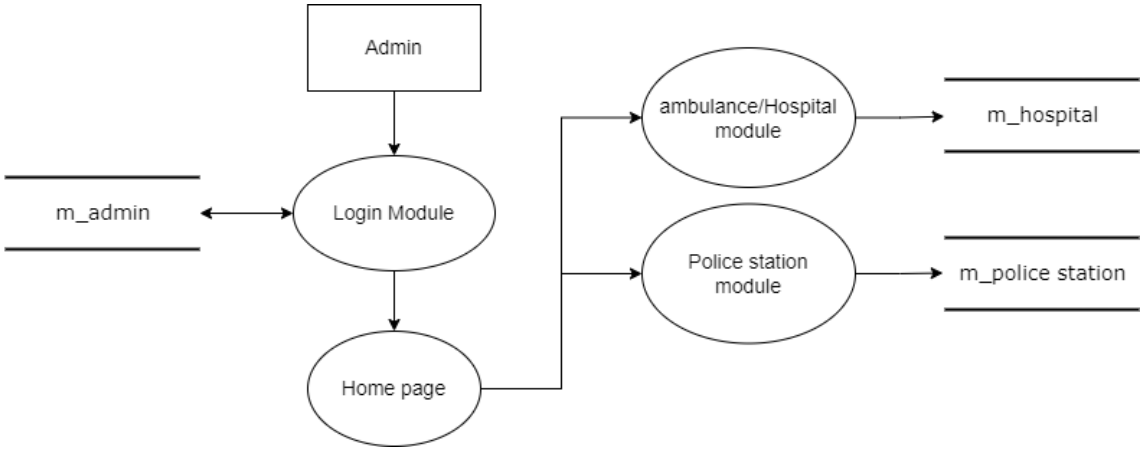

Figure No.: 4.1.2 Data Flow Diagram

Figure No.: 4.1.2 represents the data flow diagram of the proposed application. This represents the ways or sequence in which the data is being used in the project. As we can see in the above figure the data flow diagram is from the admin part.

4.1.3 USE CASE DIAGRAM FOR ADMIN

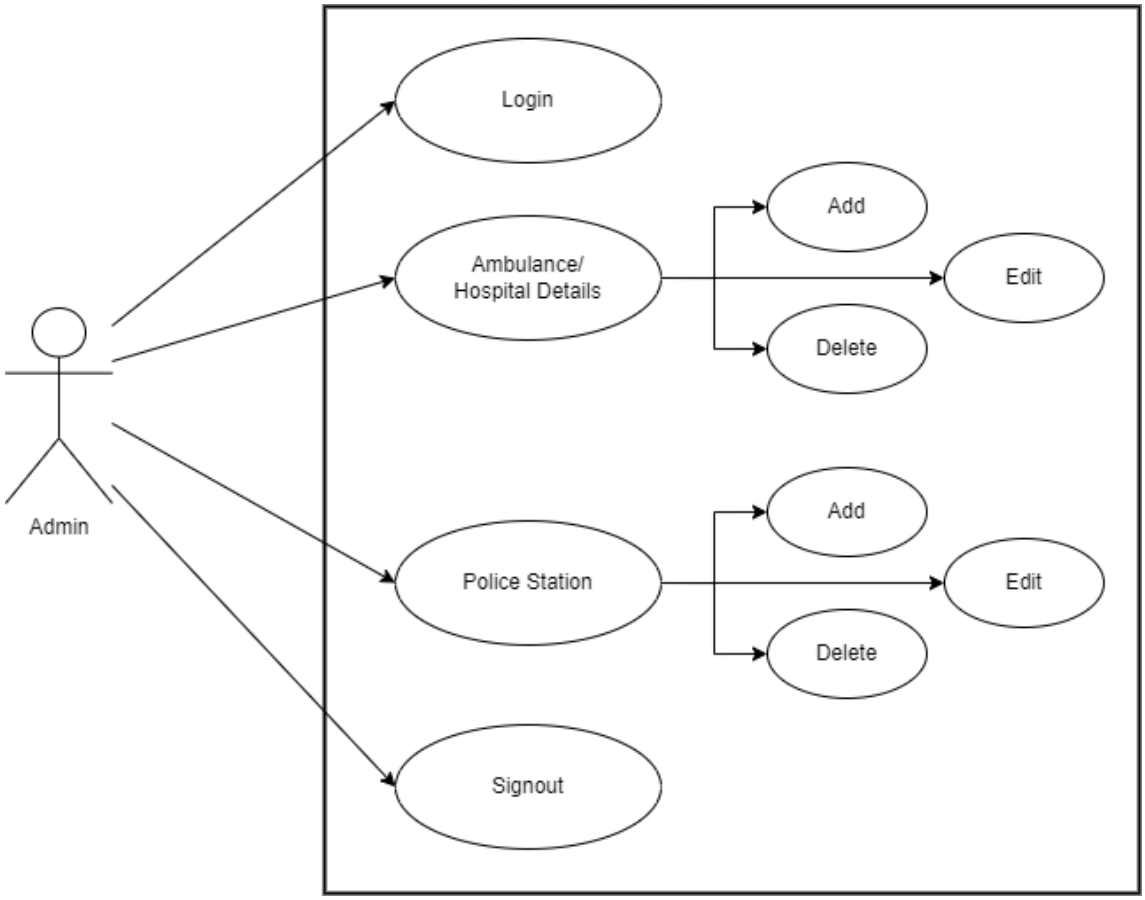

Figure No.: 4.1.3 Use case diagram for admin

Figure No.: 4.1.3 represents the use case diagram for admin for our proposed project. In the diagram, we can see that the admin is able to log in and add details of helpline services and also will have monitoring of the message sent between the user and the emergency contact. And when the woman is in danger will press a button which will trigger sending location to emergency contacts.

4.1.4 USE CASE DIAGRAM FOR USER

Figure No.: 4.1.4 Use Case Diagram for the user

Figure No.: 4.1.3 represents the Use case diagram of the proposed project. It depicts different users' roles or actions which can be performed by using the application. The main user is Women and even the Guardians don't need to use the application. They will use the message service application and for location, they will use google Maps.

Table 4.1: System Design Diagrams

Sl no:	Figure No:	Title:
1.	4.1.1	System Architecture
2.	4.1.2	Data flow diagram
3.	4.1.3	Use case diagram for admin
4.	4.1.4	Use case diagram for user

4.2 ASSUMPTIONS AND DEPENDENCIES

The web application is a prerequisite for the mobile application that is being developed. The web application serves as a backend, and the admin is in charge of it. The functionality of the mobile application will be impacted by any problems with the web application. Additionally, the Android version of the phone is crucial because only a few versions of Android are compatible with the mobile application.

The MySQL database and the Apache Tomcat server are required for the web application to function. Any problem with the Tomcat server will prevent the software from being deployed to the browser. These are the project's underlying presumptions and dependencies.

CHAPTER 5
REQUIREMENTS

CHAPTER 5 REQUIREMENTS

5.1 FUNCTIONAL REQUIREMENTS

- **SOS Alert using panic button:** SOS is a distress signal used to request assistance in an emergency. SOS sends an alarm message with the user's GPS position to a registered emergency contact list when women press the panic button.

- **Helpline Services:** here various helpline services like a Police station, and ambulance/Hospital will be provided in the application. The admin has the control of adding, deleting, and editing these services.

- **Geo-fencing**: Geo-fencing is a feature in a software program that uses the global positioning system to define geographical boundaries. A geofence is a virtual barrier. Programs that incorporate geo-fencing allow an administrator to set up triggers so that when a device enters (or exits) the boundaries defined by the administrator, a text message alert is sent.

5.2 NON - FUNCTIONAL REQUIREMENTS

This report refers to the non-functional requirements of the application. To develop the application, we consider the following non-functional requirements:

User interface:

A user-friendly graphical interface with buttons and links should be offered by the system, allowing users to "click and go" through it. so that there would be fewer mistakes made when entering the data in the correct fields.

Performance:

According to the specifications, the system should achieve its goals effectively and efficiently. Response times should be fast.

Error Handling:

During data input, if errors are occurring then appropriate messages should be displayed so that the user can easily identify and rectify them.

Security issues:

The system has to be protected. The system can only be accessed by authorized users. Users are verified by inputting their ID and password.

5.3 SOFTWARE REQUIREMENTS

IDE Used: Eclipse.
Backend:SQLyog
Services: Geolocation Package, SMS Package
Server: Apache Tomcat server
Android OS: Lollipop 5.0 +

5.4 HARDWARE REQUIREMENTS

Processor: Snapdragon, Dual Core
Memory Space: 50 Mb
RAM: 512 MB
GPS enabled Android Phone

CHAPTER 6
METHODOLOGY

CHAPTER 6 METHODOLOGY

The methodology which is being used is SMS, Geofencing and wireless application protocol .

SMS :

Short message service short SMS as we know, is used for communication purposes. It is a text messaging service found on most mobile phones and telephone systems. SMS uses the Short Message Peer to Peer Protocol (SMPP) to exchange messages with telephone service providers' gateways. When a victim presses the panic button in our app, SMS messages are delivered, and the victim's location is revealed in the alert message.

Geofencing:

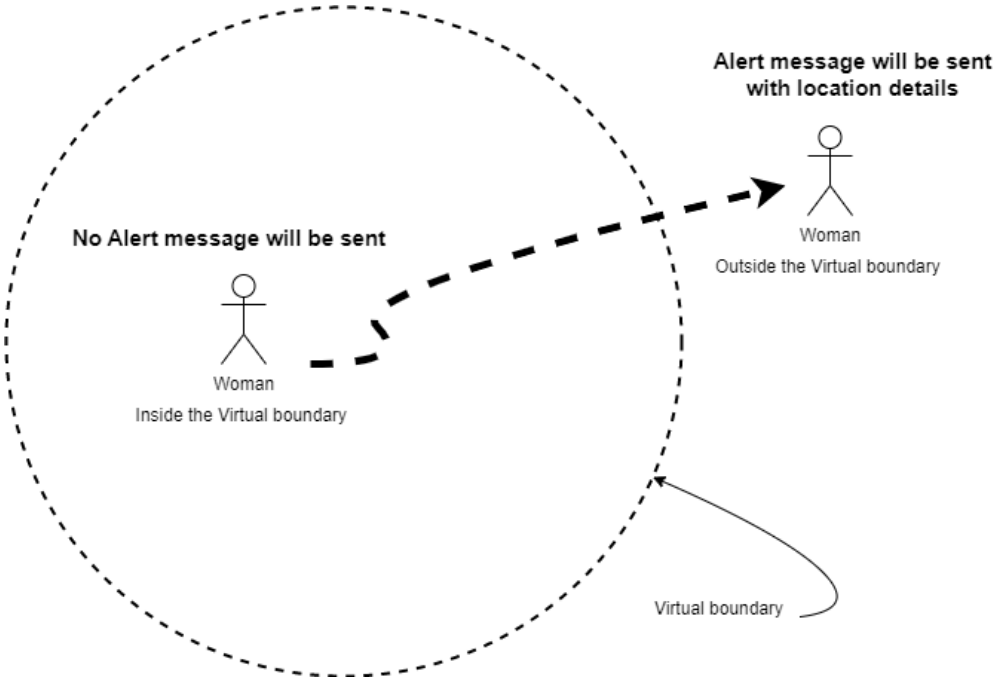

Figure No.:6.1 Geofencing feature

Figure 6.1 represents the geofencing feature that is being used in the proposed project. The technology being used to create a virtual fence in the map will trigger some action that has been pre-defined upon crossing the perimeter, it could be coming inside or going outside the virtual fence; it is the basic idea behind geofencing technology. The global

positioning system is being used in this technique to know the whereabouts of the target. A geographic mapping system is used and upon this, the geofence region will be created. The virtual boundary can be of variable size depending on the application's functionality or the user. By using the Haversine formula we will be implementing this technology. This technology can also use radio frequency identification for functioning. The Haversine formula is

$$\left(\frac{d}{r}\right) = haversine(\Phi_2 - \Phi_1) + cos(\Phi_1)cos(\Phi_2)haversine(\lambda_2 - \lambda_1)$$

where r is the radius of the earth, d is the distance between two points, □*1,* □*2* is the latitude of the two points, and □1, □2 is the longitude of the two points respectively.

Wireless Application Protocol

Wireless Application Protocol (WAP) is one such technical standard protocol that facilitates data access between a browser/internet and a mobile device. It is built for small browsers, allowing the development of web applications for mobile devices.This protocol's primary goal is to deliver enhanced data services and internet content to various wireless terminals,including mobile devices. To allow for scalability and expansion,the protocol is designed in a tiered manner. With a multilayered structure made up of Application, Session, Transport, Security,and Transaction layer, it also offers flexibility

The methods used in the project are as follows:

First, the database is built using MySQL, this database consists of the user details, hospital details, police station details, and the alert message monitoring detail.

Then using java workspace by using the Eclipse IDE we are building the backend and the web application. The web application is built using HTML and CSS and we have used jsp, these jsp pages consist of jsp, HTML and CSS tags. And these pages are easier to maintain as compared to the servlet.

Apache tomcat server is being used, it acts as a web container, as it allows us to run jsp that is based on the web application. The web application built is used by the admin.

The mobile application is built using java and the web application will act as a backend to the mobile application. Any process in the mobile application will go to the web application and then to the database and give back the response to the web application, and the web application will respond back to the mobile application.

In the Mobile application, the Geolocation package will be used to fetch the latitude and longitude of the user. The Haversine formula will be used for the functioning of the geofencing feature.

CHAPTER 7
EXPERIMENTATION

CHAPTER 7 EXPERIMENTATION

7.1 SOFTWARE DEVELOPMENT

```
public static boolean loginCheck(String username,String password)
{
    boolean flag=false;
    String sql = "";
    try
    {
        connection=DAO.getConnection();
        statement = connection.createStatement();
        sql = "select * from m_admin where admin_id='"+username+"' and admin_password='"+password+"
        System.out.println("********** Investigator Login Info **********");
        System.out.println(sql);
        resultSet = statement.executeQuery(sql);
        while(resultSet.next())
        {
            flag=true;
        }
        System.out.println("Admin Login Status : "+flag);
    }
```

Figure No.: 7.1.1 Admin Login

Figure No.: 7.1.1 gives the code snippet of the admin login credentials checking. getConnection() method creates a Connection object, which is used to create SQL statements, send them to the database, and process the results.

```
<style>
body{
background-color:#9f9f9f;
background-image:url('<%=request.getContextPath()%>/res/Images/back1.png');
}

</style>
</head>
<body>
<section id="content">

<h1 id="wrapper" style="color:white;">ADMIN HOME PAGE</h1>

<div style="position:relative;width:640px;height:400px;top:-125px;">

</div>
<div style="position:relative;width:640px;height:400px;top:-125px;">


</div>
<div class="footer"></div>
</section>
```

Figure No.: 7.1.2 Designing of Admin Page

Figure No.: 7.1.2 gives the code snippet part of web page designing of the admin home page .getContextPath() returns the portion of the request URI that indicates the context of the request. The context path always comes first in a request URI.

```
static double distanced(double lat1, double lon1, double lat2, double lon2, char unit) {
      double theta = lon1 - lon2;
      double dist = Math.sin(deg2rad(lat1)) * Math.sin(deg2rad(lat2))
              + Math.cos(deg2rad(lat1)) * Math.cos(deg2rad(lat2)) * Math.cos(deg2rad(theta));
      dist = Math.acos(dist);
      dist = rad2deg(dist);
      dist = dist * 60 * 1.1515;
      if (unit == 'K') {
        dist = dist * 1.609344;
      } else if (unit == 'N') {
      dist = dist * 0.8684;
        }
      return (dist);
    }
    /*::                                                                         :*/
    /*::  This function converts decimal degrees to radians             :*/
    /*::                                                                         :*/
    private static double deg2rad(double deg) {
      return (deg * Math.PI / 180.0);
    }
    /*::                                                                         :*/
    /*::  This function converts radians to decimal degrees             :*/
    /*::                                                                         :*/
    private static double rad2deg(double rad) {
      return (rad * 180.0 / Math.PI);
    }
```

Figure No.: 7.1.3 Code for calculating Haversine formula

Figure No.: 7.1.3. represents code defines a function distance that takes four arguments: the latitude and longitude of two points on Earth. The function returns the distance between the two points, as measured in the specified unit. The distance is calculated using the Haversine formula, which takes into account the curvature of the Earth's surface. The formula involves converting the latitude and longitude from decimal degrees to radians, performing some trigonometric calculations, and then converting the result back to decimal degrees. The deg2rad and rad2deg functions are used to convert between decimal degrees and radians. Overall, this code can be useful for calculating the distance between two points on the Earth's surface.

```
@Override
public void onClick(View arg0) {
    // create class object
    gps = new GPSTracker(AndroidGPSTrackingActivity.this);

    // check if GPS enabled
    if(gps.canGetLocation()){

        double latitude = gps.getLatitude();
        double longitude = gps.getLongitude();

        // \n is for new line
        Toast.makeText(getApplicationContext(), "Your Location is - \nLat: " + latitude + "\nLong: "
        + longitude, Toast.LENGTH_LONG).show();
    }else{
        // can't get location
        // GPS or Network is not enabled
        // Ask user to enable GPS/network in settings
        gps.showSettingsAlert();
    }

}
```

Figure No.: 7.1.4 Code for displaying the current location details

Figure No.: 7.1.4 represents the code snippet for showing the users location on the mobile application screen. The user will be able to see the latitude and the longitude details in a small toaster display at the bottom of the screen by using the getLatitude and getLongitude modules of the GPS package.

CHAPTER 8
TESTING AND RESULTS

CHAPTER 8 TESTING AND RESULTS

8.1 TEST CASES AND RESULT

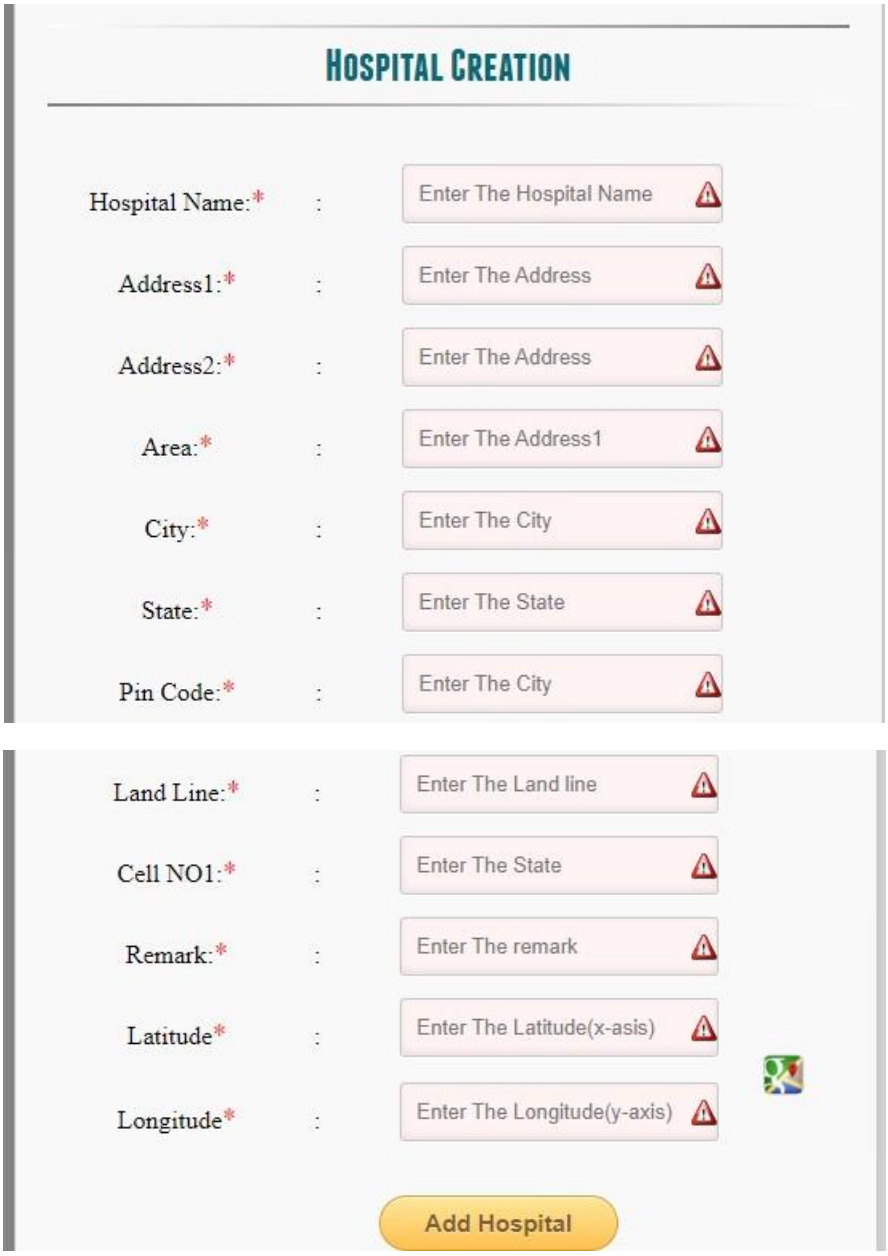

Figure No.: 8.1.1 Place to Enter Hospital Details

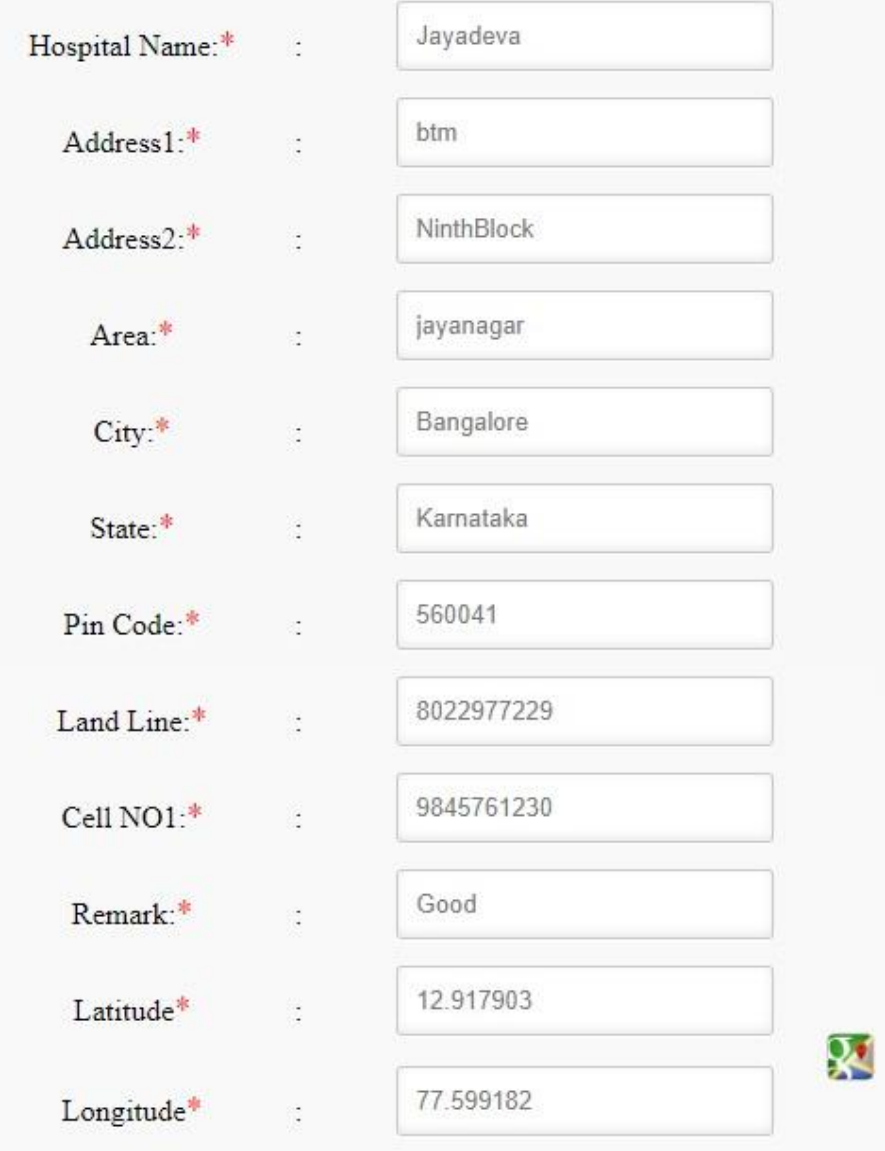

Figure No.: 8.1.2 Included Hospital Information

Select	Code	Hospital Name	Address1	City	State	Pin	Cell1	Remarks	Latitude	Longitude
☐	1	sagar	sagar hospital,bangaloree	bangalore	karnatakaeeee	560001	7278416895	good	12.93114999	77.583305999
☐	4	Jayadeva	btm	Bangalore	Karnataka	560041	9845761230	Good	12.917903	77.599182

Figure No.: 8.1.3 Result of Hospital details

Figure No.: 8.1.1 represents the place to enter the new hospital details, Figure 8.1.2 shows the inclusion of new hospital information and Figure 8.1.3 represents the result of this test case where we get the updated list of the hospitals in the web page.

Figure No.: 8.1.4 Registration page of mobile app

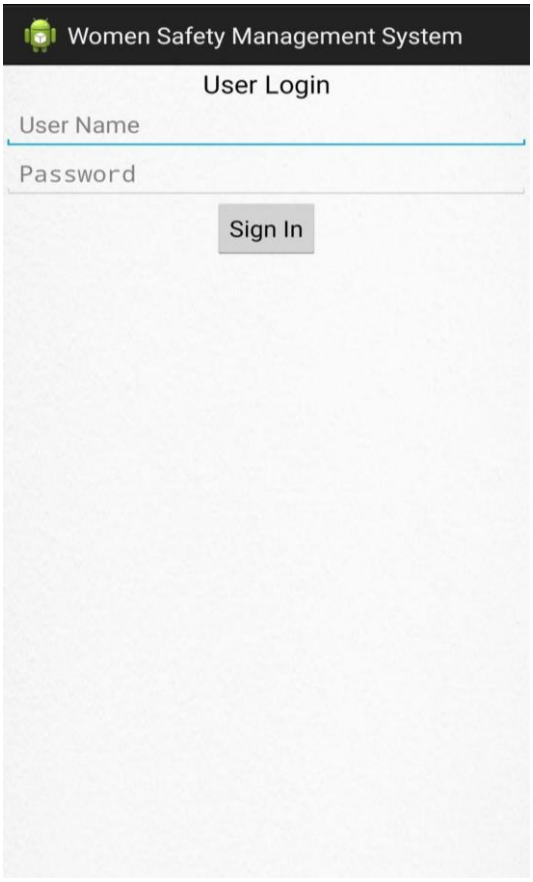

Figure No.: 8.1.5 Login page of mobile app

Figure 8.1.4 shows the mobile application's registration page. The user will provide information such as their name, password, phone number, and email address. The login page is shown next in Figure 8.1.5. If the user does not enter the necessary credentials, we get an error message displayed, as seen in the figure below.

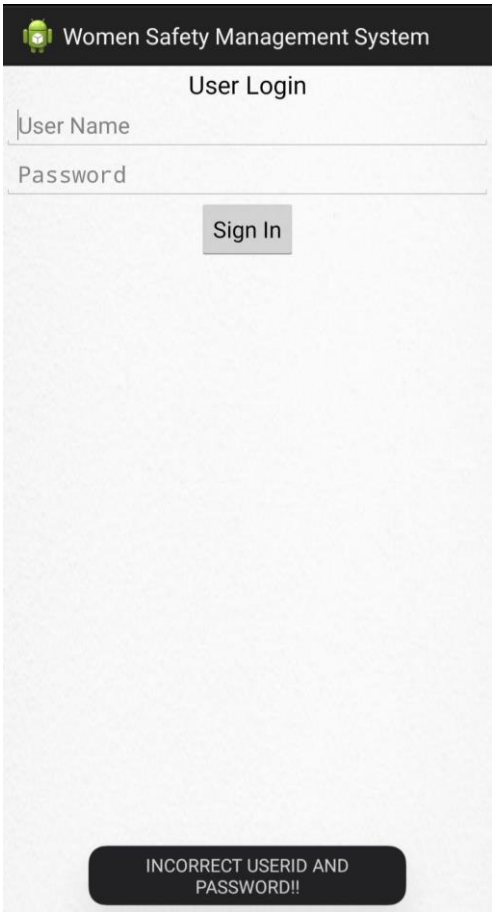

Figure No.: 8.1.6 Incorrect UserID or Password in login page

Figure No.: 8.1.6 shows the user entering incorrect login information. And a toast message has been displayed at the bottom, indicating that the user should try again with the login credentials.

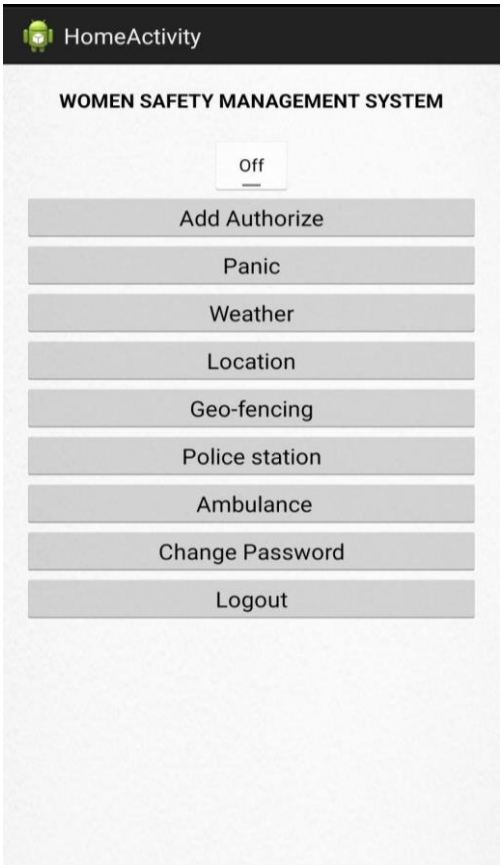

Figure No.: 8.1.7 Home page of the mobile app

Figure 8.1.7 shows the Home page of our mobile app. It consists of adding authorized emergency contacts, a panic button, a weather button that displays the current location's weather, and a location button that displays the current location's latitude and longitude. Geofencing is available, as well as helpline services such as police stations and ambulances. The password can also be changed by the user. Finally, we see the logout button.

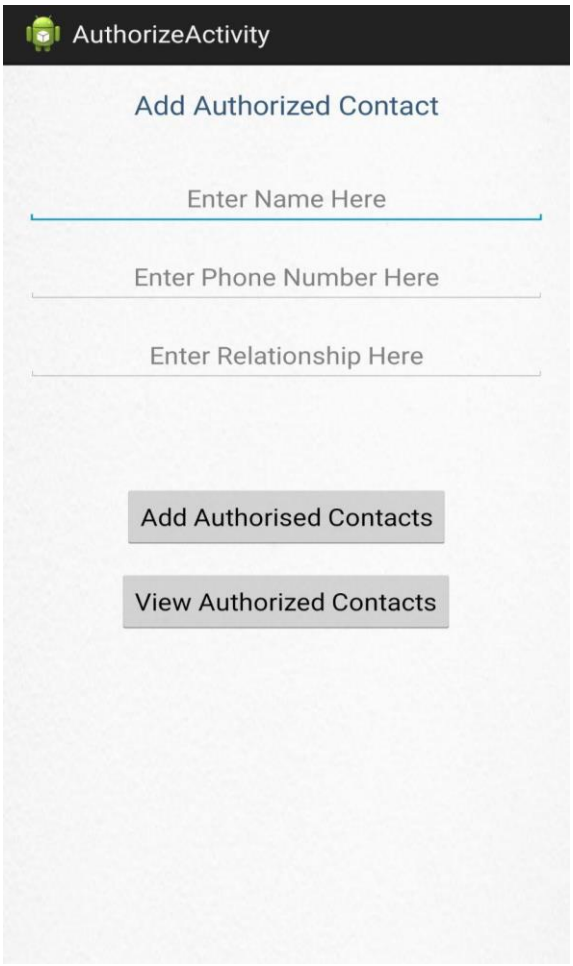

Figure No.: 8.1.8 Adding Authorized Contact Details

Figure No.: 8.1.8 shows the application page where we will enter the women's emergency contact information, which contains their name, phone number, and relationship.

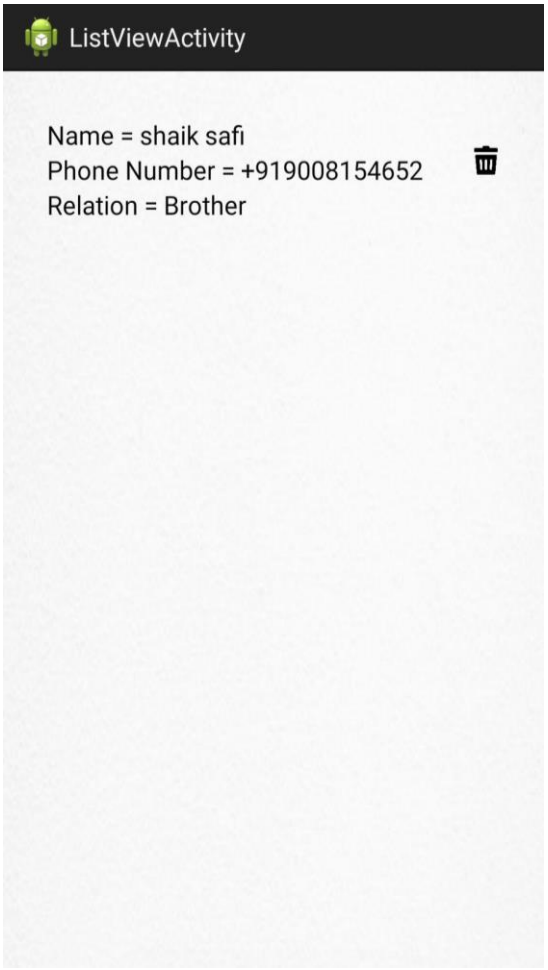

Figure No.: 8.1.9 List of Contact Details

Figure No.: 8.1.9 shows a list of emergency or authorized contacts. We can also delete the contact by clicking the delete sign on the right side of each contact. When women hit the panic button, these contacts will receive an alert message with the woman's location.

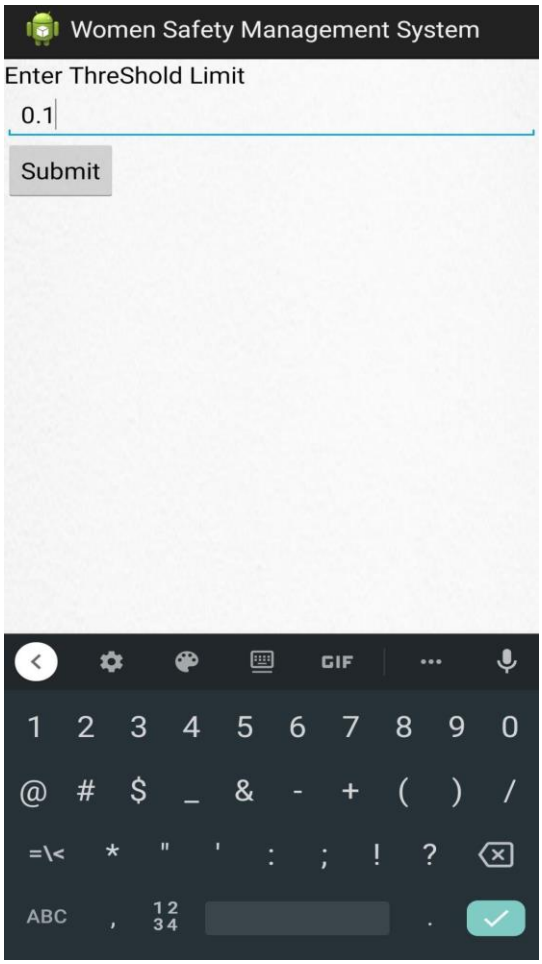

Figure No.: 8.1.10 Giving the distance information for geofence feature

The application page that appears when we click the geofence button on the home page is shown in Figure No.: 8.1.10. On this page, we provide distance information to help you create a virtual boundary or zone. Here, 0.1 denotes that we want to set a buffer of 100 meters in all directions horizontally from our current location.

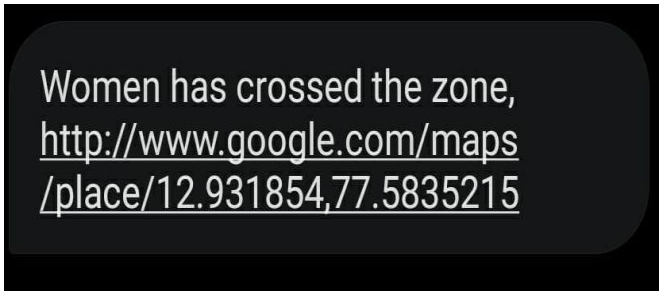

Figure No.: 8.1.11 Alert message for geofence feature

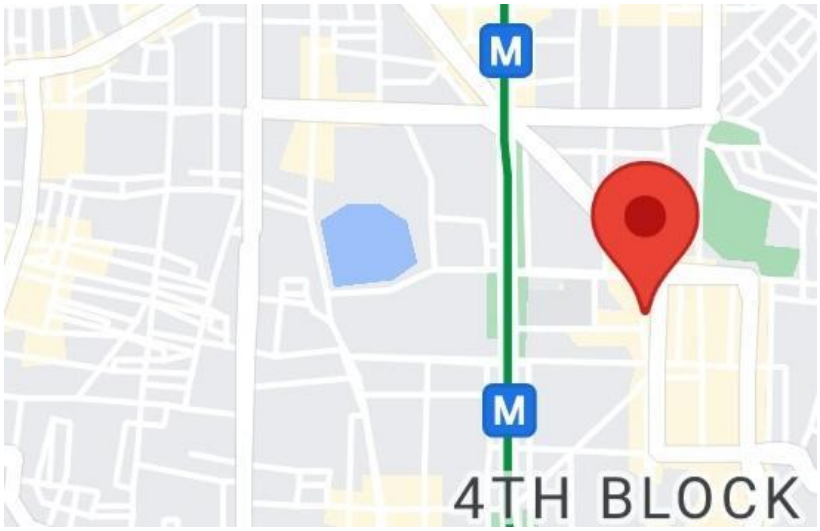

Figure No.: 8.1.12 Map showing the location of women after she cross the geofence zone

Figure No.: 8.1.11 depicts the alert message that the user receives when the woman crosses the virtual fence she has set using the app's geofence feature. We acquire the woman's location after clicking the link, as shown in Figure No.: 8.1.12.

8.2 SCREENSHOTS OF OUTPUT

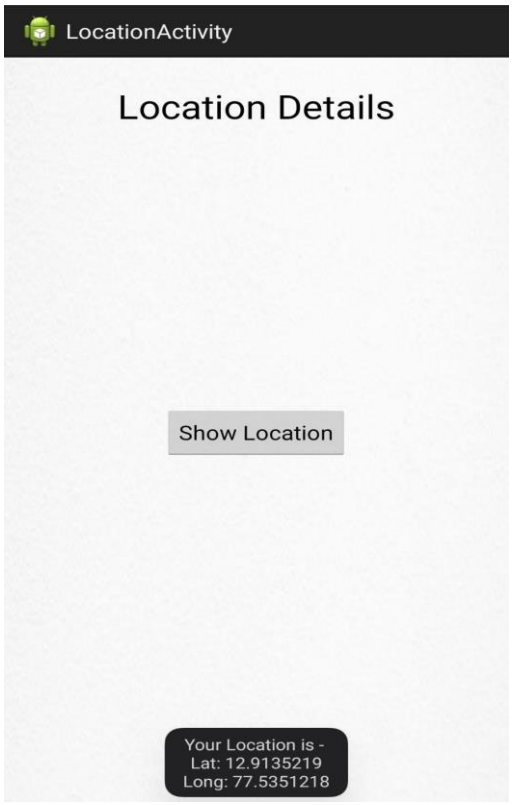

Figure No.: 8.2.1 Output for current location feature

Figure No.: 8.2.1 shows the person's present location. As indicated in the accompanying figure, this current location consists of Latitude and Longitude.

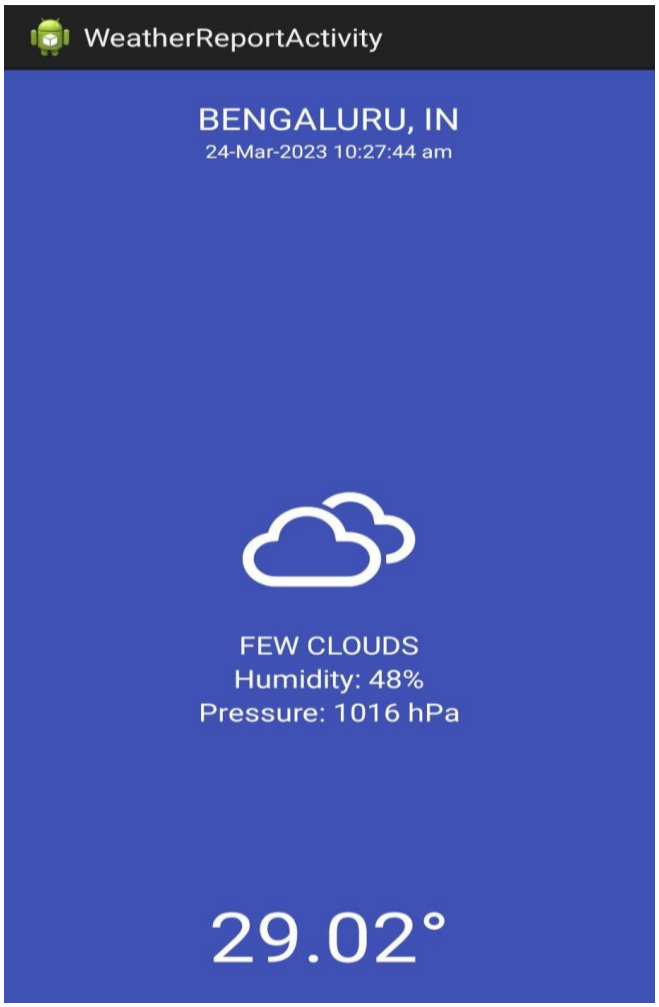

Figure No.: 8.2.2 Output for Weather feature

Figure No.: 8.2.2 shows the current temperature of the present location, as well as the humidity and pressure in the atmosphere.

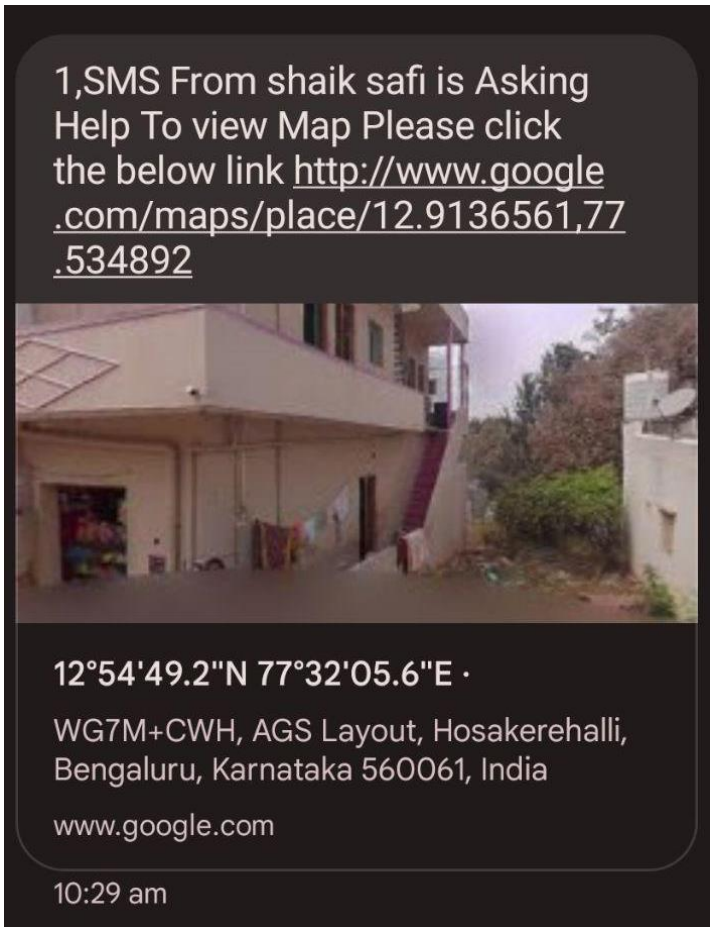

Figure No.: 8.2.3 Output for Panic button feature

Figure 8.2.3 shows the alert message that we receive when women hit the panic button. The link will take you to Google Maps, which will display the location of women on the map.

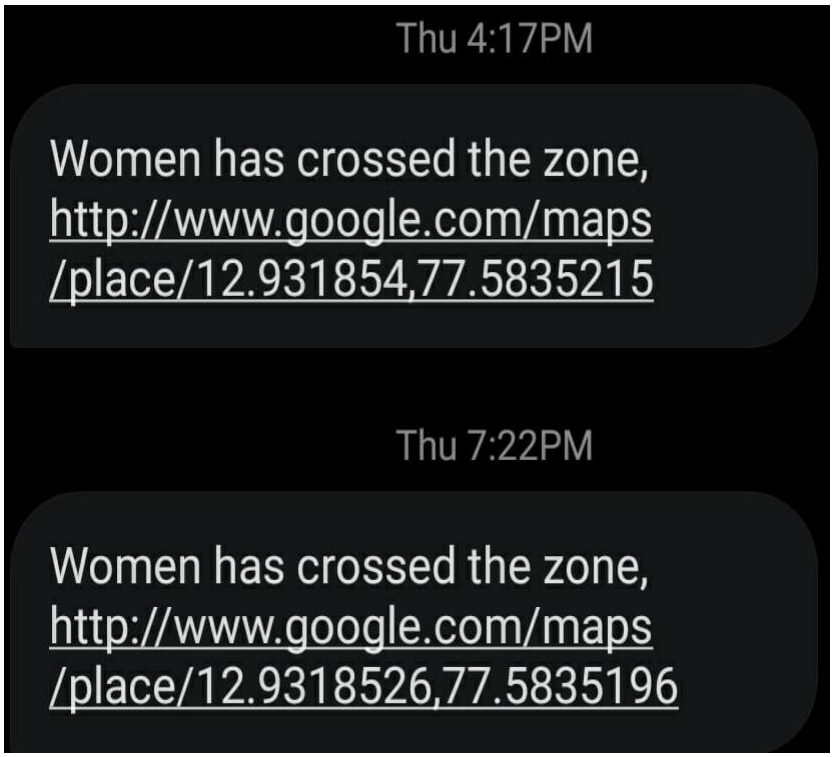

Figure No.: 8.2.4 Output for geofence feature

Figure 8.2.4 shows the alert message that we receive when a woman crosses the virtual zone or fence that she has established using the geofence feature. This geofence function allows women to send the message without panicking. The link will lead you to Google Maps, where the position of women on the map will be displayed.

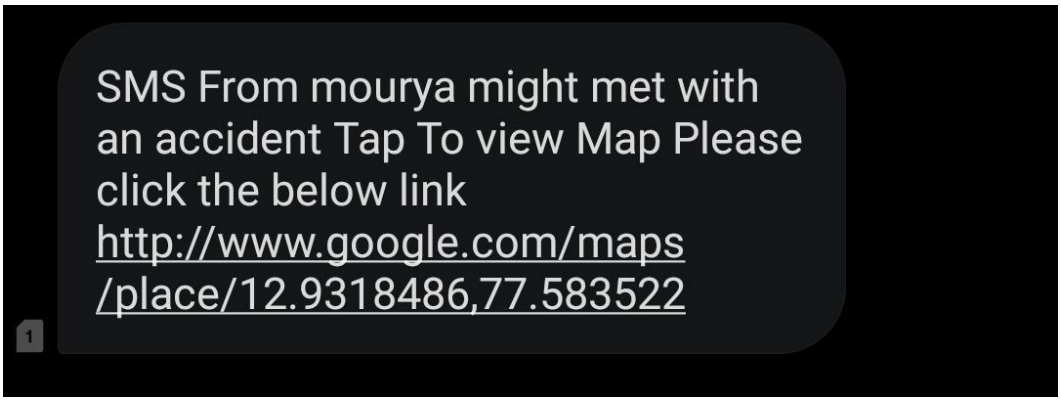

Figure No.: 8.2.5 Output for Ambulance feature

Figure 8.2.5 shows the alarm message received when women press the Ambulance button. The link will lead you to Google Maps, where the position of women on the map will be displayed. Many details about the ambulance center will be saved in the database.This alarm message will be transmitted from the woman's location to the nearest ambulance center.This feature works similar to police station .When police station feature is pressed ,alert message will be sent to the nearest police station that is stored in the database.

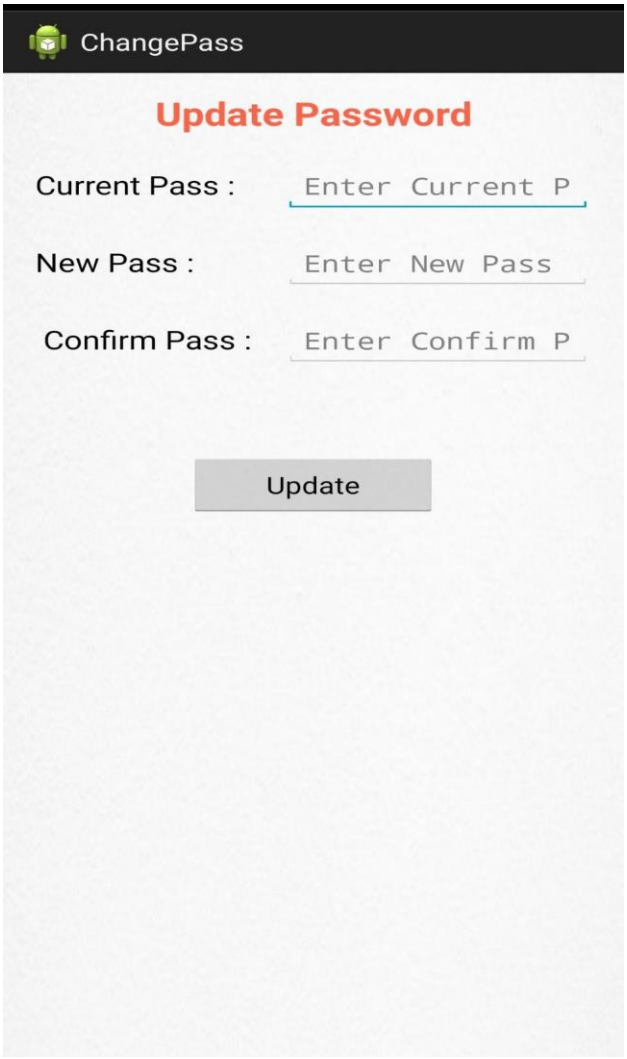

Figure No.: 8.2.6 Application page for changing password

Figure 8.2.6 represents the page for changing or updating the password. All the above figures show the various output of each feature in the application.

8.3 EVALUATION OF RESULTS

Sl. No.:	Feature	Operation	Remark
1	Hospital	Adding details	**Pass**
2	Hospital	Editing the first name	**Fail**
3	Login	Correct User ID & Password	**Pass**
4	Add Emergency Contact	Name, Phone Number and Relationship	**Pass**
5	Panic button	Send SMS	**Pass**
6	Geo-fencing	Send SMS	**Pass**
7	Police station	Send SMS	**Pass**
8	Ambulance	Send SMS	**Pass**

Table 8.3.1: Evaluation result

Table 8.3.1 shows the status of the operation of each feature in the application. In the backend website, all the functionalities are working properly but one small issue is that, we are not able to edit the first name in the hospital. And in the mobile application, features are working properly, we can add emergency contacts, we can send the alert message with location using panic button. Geofencing feature is also working properly, one small issue is that we are able to send alert messages only to one person. Current location, weather, Police station and ambulance are also working properly.

CHAPTER 9
CONCLUSION AND FUTURE WORK

CHAPTER 9 CONCLUSION AND FUTURE WORK

9.1 CONCLUSION

The objective of the project has been met, that is to build a mobile application for women which acts as a safety management system. We are able to provide many safety features, some of the main ones are panic button, geofencing, helpline service like ambulance/hospital and police station. We are able to send alert messages to only one person when using the geofencing feature. With several measures taken around the world by many personnel and organizations in providing women safety, our mobile application will be one among those efforts to make women feel secure and confident to go out in society.

9.2 SCOPE FOR FUTURE WORK

A voice recorder can be included as one of the features and the recorded audio file could be stored in the cloud storage service so that even if a mobile phone cannot be accessed, gets lost, or gets damaged during a time of crisis, the recorded clip could be fetched from the cloud service for future procedures. Also in geofencing feature, sending alert message to multiple person can also be implemented. These are some of the scopes for future work .

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SAMPLE CODE

Code for sending message when the panic button is pressed.

```
new ExecuteTask().execute(String.valueOf(latitude), String.valueOf(longitude));
        Toast.makeText(getApplicationContext(), "PHONE_NUMBER_ArrayList"+PHONE_NUMBER_ArrayList, Toast.LENGTH_LONG).show();
        for (String phoneNo : PHONE_NUMBER_ArrayList) {
        String message = "SMS From "
        + userid + " is Asking Help To view Map Please click the below link http://www.google.com/maps/place/"
        + latitude + "," + longitude;
        try {
        ArrayList<String> parts = (ArrayList<String>) splitInChunks(message, 150);
        for (String part : parts) {
        SmsManager smsManager = SmsManager.getDefault();
        smsManager.sendTextMessage(phoneNo, null, part, null, null);
        }
        } catch (Exception e) {
        e.printStackTrace();
        System.out.println("error:");
        }
        }
        finish();
```

The code snippet contains an implementation of an onClick method, which is called when a view is clicked.It iterates through the PHONE_NUMBER_ArrayList and sends SMS messages to the phone numbers using SmsManager. The SMS message contains a string with the latitude and longitude info inside the link along with a message indicating that the user is asking for help.

Code to execute a network request to retrieve data about nearby hospitals/ambulances.

```
class ExecuteTaskNearHospital extends AsyncTask<String, Integer, String> {
    @Override
    protected String doInBackground(String... params) {
        try {
            HttpClient httpClient = new DefaultHttpClient();
            HttpPost httpPost = new HttpPost(Global.URL+"GetNearHospitals");
            List<NameValuePair> list = new ArrayList<NameValuePair>();
            list.add(new BasicNameValuePair("latt", params[0]));
            list.add(new BasicNameValuePair("langg", params[1]));
            httpPost.setEntity(new UrlEncodedFormEntity(list));
            HttpResponse httpResponse = httpClient.execute(httpPost);
            HttpEntity httpEntity = httpResponse.getEntity();
            return readResponse(httpResponse);
        } catch(Exception e) {
            return "";
        }
    }
```

The doInBackground method is the core of the class and is executed in a background thread.It creates an instance of the HttpClient class, initializes an HttpPost request with the URL for the GetNearHospitals endpoint, and sets up a list of parameters to send with the request. The parameters include the latitude and longitude coordinates. It then sends the request using httpClient.execute(httpPost) and returns the response as a string by calling the readResponse method

Code for sending message when the Ambulance button is pressed.

```
@Override
protected void onPostExecute(String result) {
    try {
        String testsize = "SMS From " + userid + " might met with an accident, " +
"Tap To view Map, Please click the below link http://www.google.com/maps/place/" + lati + "," + longi;
        SmsManager smsManager = SmsManager.getDefault();
        smsManager.sendTextMessage(result.trim(), null, testsize, null, null);
    } catch (Exception e) {
        e.printStackTrace();
    }
}
```

In this code block, the string testsize is constructed, which contains a message to be sent via SMS. The message includes the userid , lati, and longi values, which are presumably obtained elsewhere in the code.

Then, an instance of SmsManager is created using the getDefault() method, and a text message is sent using the sendTextMessage() method, with the recipient number being the result parameter trimmed. Any exceptions that occur during this process are caught and printed to the console via the printStackTrace() method

Code to read the response from an HTTP request and return it as a string.

```
public String readResponse(HttpResponse res) {
    InputStream is = null;
    String return_text = "";
    try {
        is = res.getEntity().getContent();
        BufferedReader bufferedReader = new BufferedReader(new InputStreamReader(is));
        String line = "";
        StringBuffer sb = new StringBuffer();
        while ((line = bufferedReader.readLine()) != null) {
            sb.append(line);
        }
        return_text = sb.toString();
    } catch (Exception e) {
    }
    return return_text;
}
```

The method takes an HttpResponse object as a parameter. It gets the content of the response as an InputStream using the getEntity() method of the HttpResponse object. It then creates a BufferedReader and reads the content of the InputStream line by line using the readLine() method until there is no more content. Each line is appended to a StringBuffer object. Finally, the contents of the StringBuffer object are converted to a string and returned as the result of the method.

If any exception occurs during the execution of the method, an empty string is returned.

Code for displaying the Weather activity in the location.

```
public class WeatherReportActivity extends Activity {
    TextView cityField, detailsField, currentTemperatureField, humidity_field, pressure_field, weatherIcon, updatedField;
    Typeface weatherFont;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_weather_report);
        weatherFont = Typeface.createFromAsset(getAssets(), "fonts/weathericons-regular-webfont.ttf");
        cityField = (TextView)findViewById(R.id.city_field);
        updatedField = (TextView)findViewById(R.id.updated_field);
        detailsField = (TextView)findViewById(R.id.details_field);
        currentTemperatureField = (TextView)findViewById(R.id.current_temperature_field);
        humidity_field = (TextView)findViewById(R.id.humidity_field);
        pressure_field = (TextView)findViewById(R.id.pressure_field);
        weatherIcon = (TextView)findViewById(R.id.weather_icon);
        weatherIcon.setTypeface(weatherFont);
        Function.placeIdTask asyncTask =new Function.placeIdTask(new Function.AsyncResponse() {
            public void processFinish(String weather_city, String weather_description, String weather_temperature,
                                      String weather_humidity, String weather_pressure, String weather_updatedOn,
                                      String weather_iconText, String sun_rise) {
                cityField.setText(weather_city);
                updatedField.setText(weather_updatedOn);
                detailsField.setText(weather_description);
                currentTemperatureField.setText(weather_temperature);
                humidity_field.setText("Humidity: "+weather_humidity);
                pressure_field.setText("Pressure: "+weather_pressure);
                weatherIcon.setText(Html.fromHtml(weather_iconText));
```

This code specifies all the content to be present in the weather report page ,like the city name, time , humidity ,pressure , current temperature and also to display the weather icon of the location which will be specified in code.

FUNDING AND PUBLISHED PAPER DETAILS

We have published our research paper in the Journal **- International Journal of Engineering Research & Technology ISSN: 2278 - 0181**

Paper Title : Maximizing Women's Safety with an Effective System

Paper ID : IJERTV12IS030064, Vol. 12 Issue 03, March - 2023

DOI : 10.17577/IJERTV12IS030064

GITHUB LINK

https://github.com/CSE-DSU/Team7_WomenSafetyManagementSystem