

AHE FAST AMBULANCE SERVICE APPLICATION



MUHAMMAD ATTA UR REHMAN

18-Arid-5198

HAMZA AFZAL

18-Arid-5142

EHTISHAM ISHFAQ

18-Arid-5131

**DEPARTMENT OF COMPUTER SCIENCE
BARANI INSTITUTE OF MANAGEMENT & SCIENCES
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by

MUHAMMAD ATTA UR REHMAN

18-Arid-5198

HAMZA AFZAL

18-Arid-5142

EHTISHAM ISHFAQ

18-Arid-5131

A thesis submitted in partial fulfillment of
the requirement for degree of

Bachelors
in
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DEPARTMENT OF COMPUTER SCIENCE
BARANI INSTITUTE OF MANAGEMENT & SCIENCES
RAWALPINDI, PAKISTAN
2018-2022

CERTIFICATION

I hereby undertake that this research is an original one and no part of this thesis falls under plagiarism, if found otherwise at any stage, I will be responsible for the consequences.

Name: **Muhammad Atta Ur Rehman** Signature: _____

Registration Number: **18-Arid-5198** Date: _____

Name: **Hamza Afzal** Signature: _____

Registration Number: **18-Arid-5142** Date: _____

Name: **Ehtisham Ishfaq** Signature: _____

Registration Number: **18-Arid-5131** Date: _____

Certified that the contents and form of thesis entitled “**AHE FAST AMBULANCE SERVICE APPLICATION**” submitted by “**Muhammad Atta Ur Rehman , Hamza Afzal & Ehtisham Ishfaq**”. has been found satisfactory for requirements of the degree.

Supervisor: Madam Sadia Zar

Signature: _____

Date: _____

DEDICATION

This project is dedicated to our beloved parents whose prayers and affection enabled us to be what we are today. We also like to dedicate a part of our work to our respected and kind teachers that making us able to think wide and sharp in all perspective of life.

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MUHAMMAD ATTA UR REHMAN

18-Arid-5198

HAMZA AFZAL

18-Arid-5142

EHTISHAM ISHFAQ

18-Arid-5131

CHAPTER 1

INTRODUCTION

It is very difficult for human beings in a tight spot situation to call the ambulance and manage the patient. So, the purpose of making this application is to provide a better application which is reliable in emergency situation and give quick and efficient medical services. Our project title is “AHE Fast Ambulance Service Application” using mobile Global Positioning System to connect user with Ambulance EMTs (Emergency Medical Technicians) on the location where they want to be picked up. The purpose to develop this application is to provide an efficient and advance way to manage the ambulance’s route plans. It also provides the facility of first aid through Microvideo and in case of high critical situation a nearby medical center’s destination with routing plan will be guided by the app to the user. The Application also provides communication feature.

1.1 PROJECT OBJECTIVE

The main objective of this application is to give fast ambulance service in critical situation. People can select any type of ambulance needed in the time of emergency. User requests for an Ambulance on application, available ambulance is assigned on the user request, EMTs gets patient location and reaches to the spot in time.

1.2 SCOPE OF THE PROJECT

The platforms for this application are Android OS and iOS. The main functionality is to provide paramedic the exact location of the incident. The information about the incident spot will be obtained through GPS. A user can view the location of ambulance. It also allows communication between users and EMTs via text message or voice call.

1.3 PROBLEM STATEMENT

Currently in critical situation people face problem to call 1122 or other ambulance services, people don’t know how to handle the patient in emergency situation by following wrong procedure the patient might risk his life. EMTs mostly face the common problem, finding the accurate location of a patient.

Although there are many messaging apps today but if paramedic has to reach the destination through GPS he must have to switch between Map and messaging app, this switching causes unexpected behavior it is obvious mobiles phones rarely multi-task simultaneously. So, the application provides the functionality of communication. This feature is provided to save time and avail ambulance service quickly and efficiently.

1.4 LIFECYCLE FOR AMBULANCE APPLICATION PROJECT

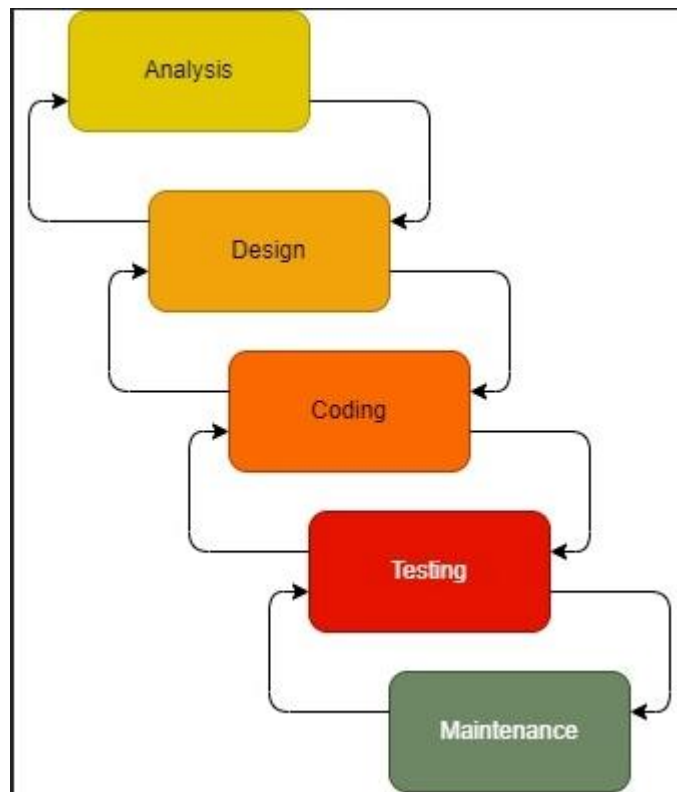


Figure 1.4.1: Life Cycle of AHE Fast Ambulance Service App

1.5 INTRODUCTION TO TOOLS AND TECHNOLOGY USED

1.5.1 Android Studio

A Platform for creating Mobile Applications by using Flutter & Dart.

1.5.2 Flutter

An Environment provided by the Google to develop Front-end for Mobile applications. Developers can create UI/UX of Mobile apps for both Android and iOS.

1.5.3 Firebase

Firebase is a development platform known originally for its real time database that's still at its core or multi node key value database optimized for synchronizing data often between user machine or smartphone and central storage in the cloud.

1.6 PROJECT BACKGROUND

Our motivation comes from a research that people have major issue with ambulance, mostly in emergency situation. Sometimes the ambulance reaches near to the incident location but due to jammed and congested area the ambulance fails to reach the exact spot. This app provides the accurate location and also gives opportunity to get rid of bogus calls from unknown people.

1.7 PROPOSED SYSTEM COMPONENTS

This system has the following components:

- Personal computer (PC) or laptop
- Android Studio
- Visual studio code
- Firebase
- Draw.io

1.8 DEVELOPMENT REQUIREMENTS

Following requirements are necessary to develop this application:

1.8.1 Hardware Requirements

- Personal Computer (PC) or Laptop

1.8.2 Operating System

- Windows 7, 10

1.8.3 Software

- Visual Studio code
- Android studio
- Firebase

1.9 SUMMARY

This Chapter includes the basic introduction about the Fast Ambulance Service Application. In a simple scenario, a person in an emergency situation dials an emergency number to call an ambulance, this phone call doesn't provide any details about the ambulance to the user such as how much time it will take, which shortest route will be available to the ambulance so it can reach to the destination as soon as possible. On the other hand, Ambulance or paramedics also don't have clear information about the person or his location, may be a person calling for help is far away or instead of getting help by the nearest hospital he contacts with other medical assistant. So, in these critical situations this Application provides medical help to the user

CHAPTER 2

STUDY OF EXISTING SYSTEM

System analysis is the process of gathering and interpreting facts, identifying problems and using the information to recommend improvements on the system. System analysis is a problem solving activity that requires intensive communication between the system users and system developers. System analysis or study is an important phase of any system development process. The system is viewed as a whole, the inputs are identified and the system is subjected to close study to identify the problem areas. The solutions are given as a proposal. The proposal is reviewed on user request and suitable changes are made. This loop ends as soon as the user is satisfied with the proposal.

2.1 STUDY OF EXISTING SYSTEM

Currently in critical situation people face problem to call 1122 or other ambulance services, people don't know how to handle the patient in emergency situation by following wrong procedure the patient might risk his life. EMTs mostly face the common problem, finding the accurate location of a patient. Although there are many messaging apps today but if paramedic has to reach the destination through GPS he must have to switch between Map and messaging app, this switching causes unexpected behavior it is obvious mobiles phones rarely multi-task simultaneously. So, the application provides the functionality of communication. This feature is provided to save time and avail ambulance service quickly and efficiently.

- It is less user-friendly.
- User doesn't know about accurate location.
- It is a time consuming process
- Not in reach of distant users

2.1.1 Disadvantages of the Existing Systems Process

- Do not have accurate location
- Time consuming
- No communication
- No recommendation facility

2.2PROPOSED SYSTEM

From various researches that people have major issue with ambulance, mostly in emergency situation. Sometimes the ambulance reaches near to the incident location but due to jammed and congested area the ambulance fails to reach the exact spot. This app provides the accurate location and also gives opportunity to get rid of bogus calls from unknown people.

2.2.1 Benefits of Proposed System

- Easy to Use
- Exchange of Location
- Quick Communication
- Nearby Assistance
- Register Complaints

CHAPTER 3

REQUIREMENT ANALYSIS

3.1 SOFTWARE REQUIREMENTS SPECIFICATIONS

A software requirement specification (SRS) completely describes the behavior of the system that is to be developed. Documents have all necessary requirements of the system.

A requirement specification (SRS) for a software system is a complete description of the behavior of a system to be developed and may include a set of use cases that describes interactions that users will have with the software. In addition to it, it also contains non- functional requirements. Non-functional requirements impose constraints on the Design or implementation (such as engineering requirements, quality standards, or design constraints). Software requirements specifications are following.

- Android Device: Minimum SDK 4.0.3(Ice Cream Sandwich).
- Processor: Core i5 and above.
- Hard Disk: 10 GB Minimum.
- RAM: 8GB or above.

3.2 FUNCTIONAL REQUIREMENTS

A functional requirement describes what a software system should do. The functional requirement is describing the behavior of the system as it relates to the system's functionality. Functional requirements in our application are as follows.

3.2.1 User Signup

To use this Application, it will be necessary for new users to signup first. By providing valid information to the system, user will get registered. To create an Account, the required fields to be filled by the user will be: First Name, Last Name, Email, CNIC, Contact & Password.

3.2.2 User Login

Users who already have an account will Login first and then they can proceed. On login screen user will enter CNIC and Password.

3.2.3 EMTs Signup

To use this Application, it will be necessary for new EMTs or Paramedics to signup first. By providing valid information to the system, EMTs will get registered. To create an Account, the required fields to be filled by the EMT will be: First Name, Last Name, Email, CNIC, Hospital Name, Hospital Contact, EMT ID, Ambulance ID, Contact & Password.

3.2.4 EMTs Login

EMTs who already have an account will Login first and then they can proceed. On login screen EMT will enter EMT ID, CNIC and Password.

3.2.5 Alerts

EMTs using the application will get notifications about the emergency spot and the user searching for an ambulance will get notified when a nearby ambulance is assigned and on the way.

3.2.6 Notifications

Notifications will occur, when a request is made or approved by the system. In Notification Tab, a user can view previous and upcoming notifications.

3.2.7 Communication Tab

An essential feature for the users to communicate with each other in real-time.

3.2.8 Location Tab

In Location tab, ongoing real-time tasks can be viewed such as: user can view location of Ambulance and its Arrival Time; for EMTs they can check the route plan to reach the destination or patient's location.

3.2.9 Admin Credentials

The person for monitoring purpose will provide personal details to create Administrative account. After account creation, the admin will login to the system.

3.2.10 Complaint Menu

In the Complaint Menu, user can submit their complaints anytime. A user can only view his submitted complain. A complain can be re-submitted by the user if the problem is not resolved or remains the same.

3.2.11 Administrative Rights

Admin has the following duties to perform such as system monitoring, dealing with queries, updating new records in database & etc. Admin also has the right to block any user from the system.

3.2.12 Super Administrative Rights

Super administrative has the entire control of the system. An admin is under the supervision of super admin. An admin can be removed from the system by super admin. A super admin controls the back-end functionality of the system as an example identifying and removing bugs, changing or removing useless functions or adding new features to the system.

3.2.13 Complaint Records

An admin is responsible for viewing daily complaints of the user. Only Admins or Super Admin can view complain records.

3.2.14 Complaint Catalogue

The complaint menu behaves as a checklist, as soon as the complaint is resolved by the Admin, the user will be notified. If the same problem occurs again the complaint can be re-submitted by the user.

3.2.15 Ambulance Categories

An Ambulance serves its basic purpose but sometimes the case is not the same. So, as an option there are two categories defined here. Category 1: Common Service: A patient's life threatening condition such as cardiac or respiratory arrest. Category 2: Rapid Assessment: A patient's serious condition such as stroke or chest pain. In the first category, case might not be too sensitive and medical assistance can be provided on the spot. But in the second

category, rapid action is must as the patient might lose his life so the medical assistance on the spot is a little difficult task.

3.3 NON-FUNCTIONAL REQUIREMENTS

There are a number of attributes of system that can serve as requirements. It is important required attributes must be specified so that their achievements lead to better performance of the system. These required attributes are also known as quality attributes as they increase the quality of a product. In our system, we implemented following quality attributes or non-functional Requirements:

3.3.1 Approach

This application will be working in all over the Pakistan.

3.3.2 Reliability

The System will work without failure, in real-time the application will respond perfectly.

3.3.3 Availability

The Application will meet the end user requirements each feature will function correctly.

3.3.4 Efficiency

The efficiency of the system will be monitored, if an unexpected behavior is analyzed improvements will be made accordingly.

3.3.5 Flexibility

This Application can run smoothly on all smart phones; the interface will integrate itself with new components. Advancement will be made according to the user requirements.

3.3.6 Security

The System will prevent security vulnerabilities against threats. Unauthorized access and modification will be detected by the Admin.

3.3.7 Enhancements

New functions or features can be added. If improvements are made the app will require an update.

3.3.8 UX

Application is user-friendly and interactive.

3.4 EXTERNAL INTERFACE REQUIREMENTS

3.4.1 User Interface

It is designed to be functional and minimal in its styling. A Panel on the left side of the application's interface will contain all tabs such as: Get Medical Assistance, Location Tab, Complaint Menu, First Aid, Account Settings and Help.

3.4.2 Hardware Interface

Smart phones with Android OS and iOS.

3.4.3 Software Interface

This Application will only be working in smartphones for better user experience.

3.5 PERFORMANCE REQUIREMENTS

Application will respond efficiently in real-time. It will take less memory and it will be available and reliable to use.

3.6 USE CASE DIAGRAM

Use case diagram are a way to capture the system functionality & requirement in UML diagrams. A use case diagram consists of a use case & actor. A use case represents a distinct functionality of a system, component, package and class.

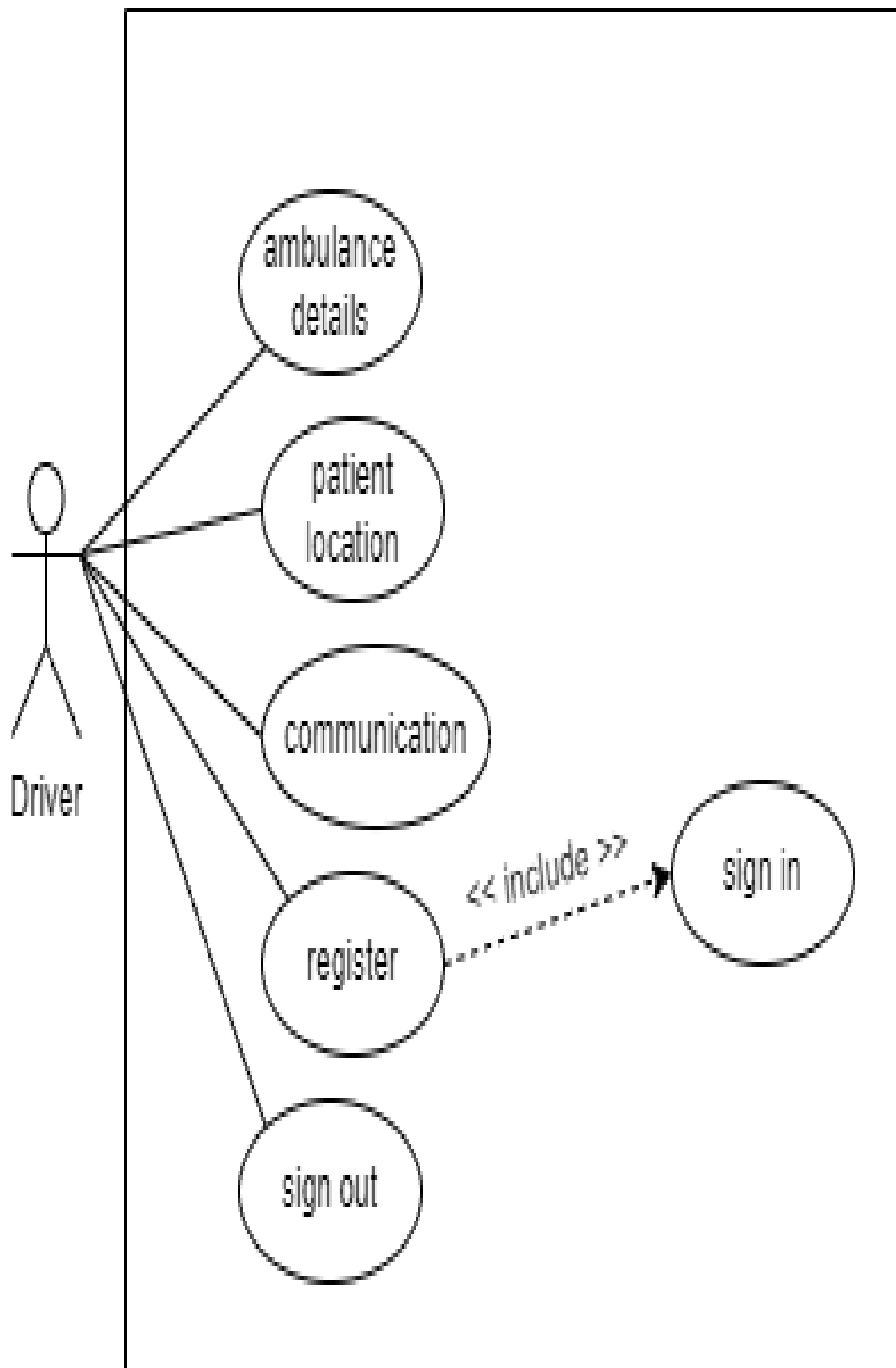


Figure 3.6.1: Use Case diagram for EMT's

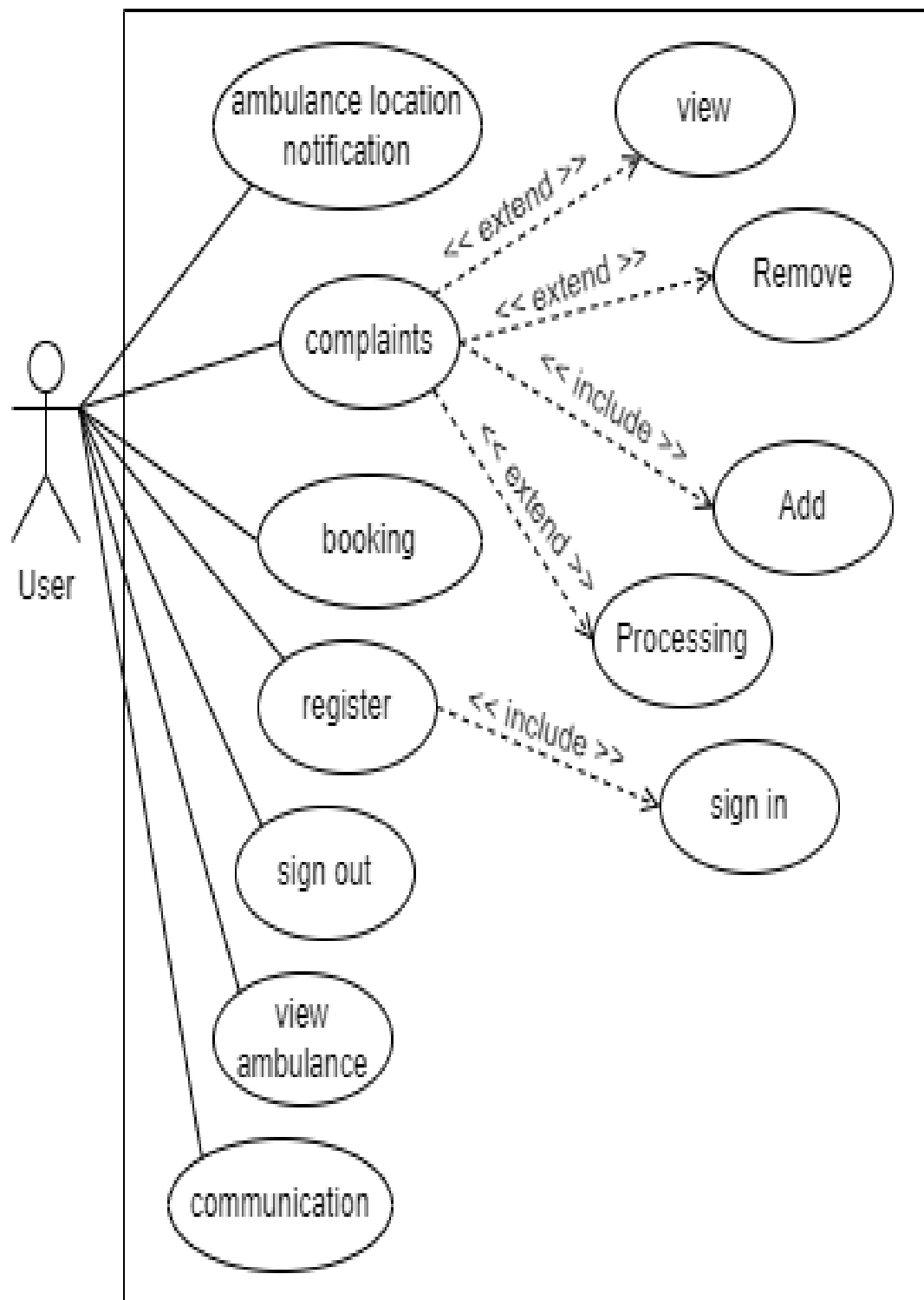


Figure 3.6.2: Use Case diagram for User

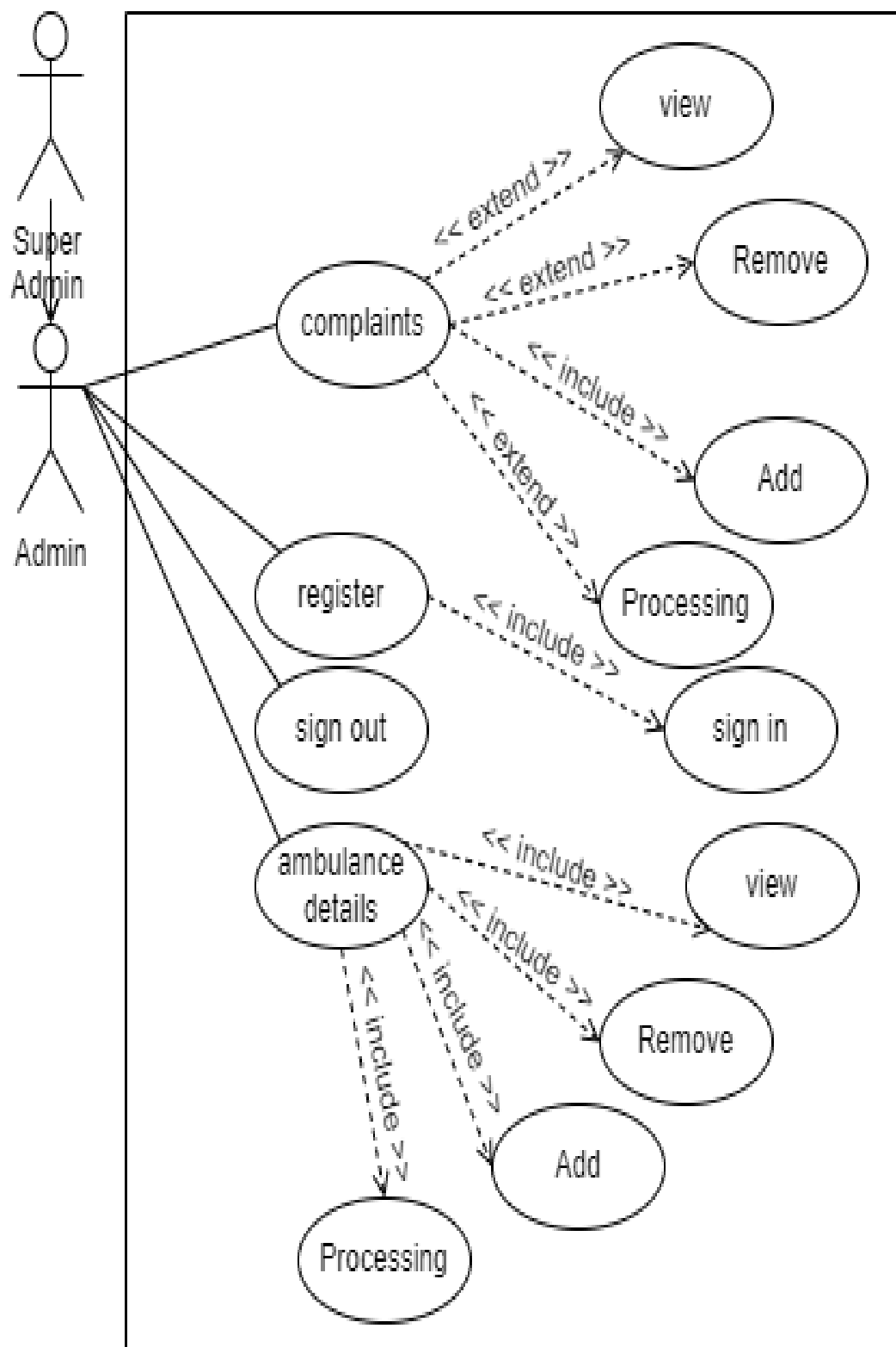


Figure 3.6.3: Use Case diagram for Super Admin & Admins

3.7 USE CASE DIAGRAM DESCRIPTION

This Application connects users and the ambulance driver through registration. After registration user signs in, after Sign-ing in user can access all modules of the application such as booking the ambulance (Getting Medical Assistance), viewing the details of the EMTs and submitting any complaints. On the other hand, the EMTs can view patient details, incident location. This app allows Users and EMTs to communicate with each other simultaneously.

An admin which is supervised by the super admin monitors the application system. Admin monitors incoming requests of the user for booking emergency rides also views ambulance location, allows users access to cancel or modify details or change provided ambulance. Admins can view complaints of the user, complaints registered on user-end will be in action when viewed by the admin. After complete processing of complaints and resolving on the customers-end the complaint is removed from the system. The super admin supervises admins; a super admin can change or remove an admin.

3.8 USE CASES

Table 3.8.1: User Sign-up

Use Case ID#	1
Use Case	Sign-up
Actor	Users
Description	The Use case is start when the actors signup.
Pre-condition	The signup exists
Post-condition	The signup in successful
Normal-flow	Enter info which required in form
Exceptions	Without signup not enter the app

Table 3.8.2: User Sign-out

Use Case ID#	2
Use Case	Sign-out
Actor	Users
Description	The Use case is start when the actors want to exit the
Pre-condition	The sign in exists
Post-condition	The sign out successful
Normal –flow	1. Register 2. Sign in
Exceptions	Without sign-in not sign-out the actor

Table 3.8.3: Communication

Use Case ID#	3
Use Case	Communication
Actor	Users
Description	The Use case is start when the actors want to communicate with driver or EMT's.
Pre-condition	The booking exists
Post-condition	The communicate successfully
Normal –flow	1. Sign in 2. Book ambulance
Exceptions	Without booking ambulance no communication

Table 3.8.4: Booking

Use Case ID#	4
Use Case	Booking
Actor	Users
Description	The Use case is start when the actors want to book ambulance
Pre-condition	The sign in exists
Post-condition	The ambulance book successfully
Normal –flow	1. Sign in 2. Select ambulance 3. Booking
Exceptions	Without sign in no booking of ambulance

Table 3.8.5: Classification of Ambulances

Use Case ID#	5
Use Case	View Ambulances
Actor	Users
Description	The Use case is start when the actor wants to book ambulance.
Pre-condition	The sign in exists
Post-condition	The list of ambulance given successfully
Normal –flow	1. Sign in
Exceptions	Without sign in or sign up

Table 3.8.6: Complaint Log

Use Case ID#	6
Use Case	Complaints
Actor	Users
Description	The Use case is start when the actors want to file complaint against service provider
Pre-condition	The sign in exists
Post-condition	The complaint submit successfully
Normal –flow	1. Sign in 2. Book ambulance
Exceptions	Without sign in or booking ambulance

Table 3.8.7: Location Notification

Use Case ID#	7
Use Case	Ambulance location notification
Actor	Users
Description	The Use case is start when the actors book the ambulance the location notification starts through pop ups
Pre-condition	The ambulance booking exists
Post-condition	The location known successfully
Normal –flow	1. Sign in 2. Book ambulance
Exceptions	Without booking of ambulance or sign in

Table 3.8.8: Ambulance Details

Use Case ID#	8
Use Case	Ambulance Details
Actor	Driver
Description	The Use case is start when the actors wants the details of ambulance
Pre-condition	The sign in exists
Post-condition	The details given successfully
Normal –flow	1. Sign in
Exceptions	Without sign in

Table 3.8.9: Patient Location

Use Case ID#	9
Use Case	Patient location
Actor	Driver
Description	The Use case is start when the actors wants to know location of patient.
Pre-condition	The ambulance booking exists
Post-condition	The location of patient get successfully
Normal –flow	1. Sign in 2. Booking notification
Exceptions	Without sign in and in the near location of patient

Table 3.8.10: EMT's Sign-up

Use Case ID#	10
Use Case	Sign-up
Actor	EMT's
Description	The Use case is start when the actors signup.
Pre-condition	The signup exists
Post-condition	The signup in successful
Normal –flow	1. Fill form
Exceptions	Not before file application to the office

Table 3.8.11: EMT's Sign-out

Use Case ID#	11
Use Case	Sign-out
Actor	EMT's
Description	The Use case is start when the actors wants to exit the app.
Pre-condition	The sign in exists
Post-condition	The app is exit successfully
Normal –flow	1. register
Exceptions	Not before timing of drivers

Table 3.8.12: Communication

Use Case ID#	12
Use Case	Communication
Actor	EMT's
Description	The Use case is start when the actor wants to communicate with admin and user of the app.
Pre-condition	The booking exists
Post-condition	The communication successfully
Normal –flow	1. sign in 2. Booking of ambulance
Exceptions	Not connect with more than one user

Table 3.8.13: View Complaints

Use Case ID#	13
Use Case	View Complaints
Actor	Admin or Super Admin
Description	The Use case is start when the actors wants to take action against complaint of services providers.
Pre-condition	The signup exists
Post-condition	The action takes on complaint successfully
Normal –flow	1. Sign in 2. Complaints
Exceptions	Not check it without sign in

Table 3.8.14: Super Admin or Admin Sign-out

Use Case ID#	14
Use Case	Sign-out
Actor	Admin or Super Admin
Description	The Use case is start when the actors wants to exit from the app.
Pre-condition	The sign-in exists
Post-condition	The exit from app successful
Normal –flow	1. Sign in
Exceptions	Not exit it without sign in

Table 3.8.15: Super Admin or Admin Sign-up

Use Case ID#	15
Use Case	Sign-up
Actor	Admin or Super Admin
Description	The Use case is start when the actors wants to enter the app.
Pre-condition	The signup exists
Post-condition	The signup in successful
Normal –flow	1. Fill form
Exceptions	Without permission of super admin

Table 3.8.16: Classification of Ambulances

Use Case ID#	16
Use Case	Ambulance Details
Actor	Admin or Super Admin
Description	The Use case is start when the actors wants to edit or remove the details
Pre-condition	The sign in exists
Post-condition	The edit or remove in details successfully
Normal –flow	1. Sign in
Exceptions	Not take details without id

3.9 USE CASE SUMMARY TABLE

Table 3.9.1: Summary Table

Use Case	Description
Sign-up and Sign-in	New user or an EMT registers his account and then logs in to his account after providing his information on the sign-up page
Booking or Reserving	The main service of the app is to provide an ambulance in an emergency situation
View Ambulances	User can view available ambulances in nearby area
View Ambulance Details	After reserving an ambulance, Patient can view the allocated Paramedic details
Patient Details	EMT's can also view Patients Location, Medical Information
Communication	Paramedic and user can communicate with each other
Complaints	User can submit complaints about the system or service
Admin	An Admin monitors the whole system
Super Admin	A Super Admin controls the entire system

3.10 SUMMARY

This Chapter focuses on describing the requirement analysis of the system. Explains software requirement specification i.e. detailed documentation of software which is to be developed, it describes the functional and nonfunctional requirements. Understanding the user's requirements as Functional requirements. Non-Functional requirements include Availability, Reliability, Efficiency & Flexibility. An overview of external interface requirements which includes user interface, hardware and software interface. Also focused on describing the software design of the system. This chapter contains all the UML diagrams of the application.

CHAPTER 4

SYSTEM DESIGN

4.1 MILESTONES

A milestone is a special event that requires special attention. Milestones can add significant value to project scheduling. They help project managers to more accurately determine whether or not the project is on schedule. We assign priorities to the milestones of our project so in this way we can achieve our goal more easily

4.2 CLASS DIAGRAM

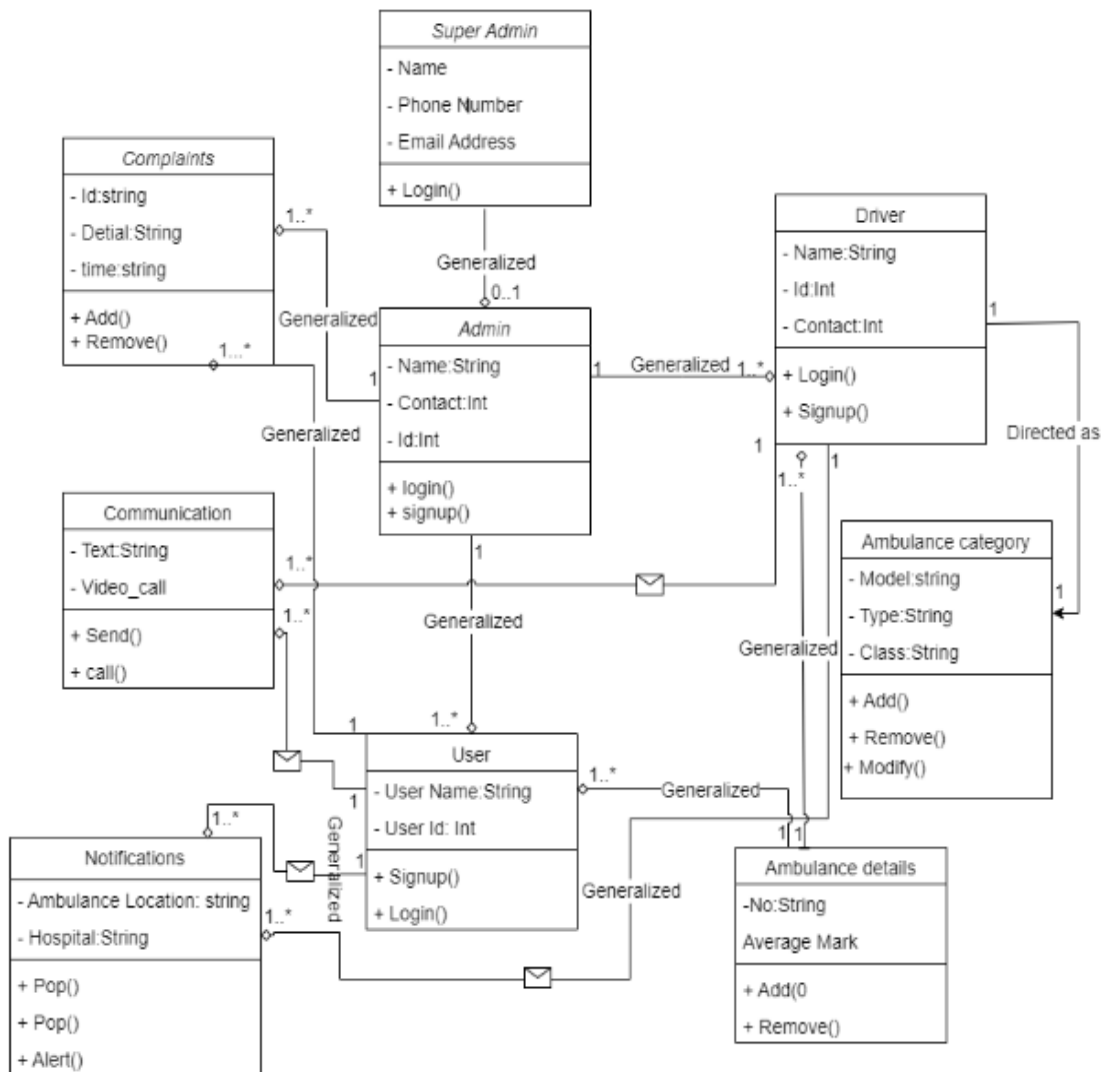


Figure 4.2.1: Class Diagram

CHAPTER 5

SYSTEM TESTING

Testing the software application is an important activity in software development life cycle (SDLC). It helps in maintaining quality of the system.

5.1 TEST CASES

Table 5.1.4 Test Case Signup Account

Test Engineer	Atif Nisar
Test Case ID	TC1
Related UC/FR/NFR	UC1
Date	13-5-2022
Pre Requisite:	None
Steps	<ol style="list-style-type: none">1. Enter phone number2. Enter User password.3. Enter confirm password.4. Click Signup Button.
Status	Pass

Table 5.1.5 Test case Login

Test Engineer	Faheem Iqbal
Module Name	Login
Test Case ID	TC2
Related UC/FR/NFR	UC2
Date	13-5-2022
Test Data	User phone no. and password.
Steps	<ol style="list-style-type: none">1. Enter Phone no.2. Enter Password.3. Click login button.
Provide valid Phone number	User No.= 03335290975
Provide valid password	Password=12345678
Expected Result	User logs in
Actual result	User logs in
Status	Pass

Table 5.1.6 Test case Book the ambulance

Test Engineer	Sadam Ahmed
Test Case ID	TC2
Related UC/FR/NFR	UC4
Date	13-5-2022
Pre-Requisite:	Logged in
Steps	<ol style="list-style-type: none"> 1. Click on book ambulance tab. 2. Set location. 3. Select category. 4. Tap on book ride.
Select an ambulance and tap on book ride	Ambulance is booked and on the way towards your location
Expected	Ambulance is booked.
Actual	Ambulance is booked.
Status	Pass

Table 5.1.4 Admin Login

Test Engineer	Ghazanfer Shah
Test Case ID	TC2
Related UC/FR/NFR	UC15
Date	13-5-2019
Test Data	Admin Phone no. and password.
Steps	<ol style="list-style-type: none"> 1. Enter phone no. 2. Enter Password. 3. Tap login button.
User enters wrong password	Display message password is incorrect
User enters wrong ph.no	Display message phone no. is incorrect
User enters valid ph.no and password	User log in successfully
Expected result	User log in successfully
Actual result	User log in successfully
Status	Pass

Table 5.1.5 EMT Login

Test Engineer	Adnan Shahid
Test Case ID	TC2
Related UC/FR/NFR	UC10
Date	13-5-2019
Test Data	EMT Phone no. and password.
Steps	<ol style="list-style-type: none">1. Enter phone no.2. Enter Password.3. Tap login button.
User enters wrong password	Display message password is incorrect
User enters wrong ph.no	Display message phone no. is incorrect
User enters valid email and password	User log in successfully
Expected result	User log in successfully
Actual result	User log in successfully
Status	Pass

5.2 ACTIVITY DIAGRAM

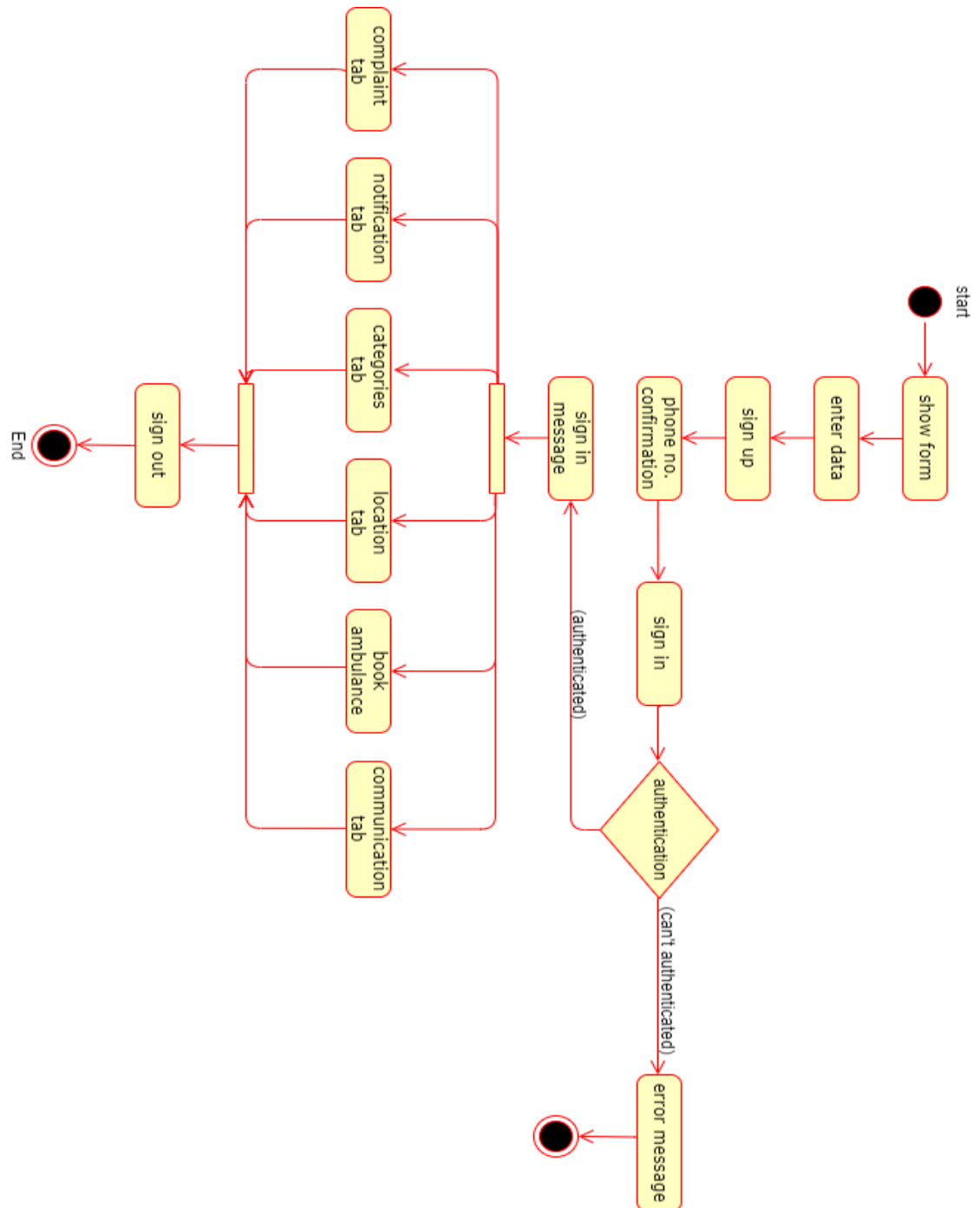


Figure 5.2.1: Activity diagram

5.3 DATA FLOW DIAGRAM

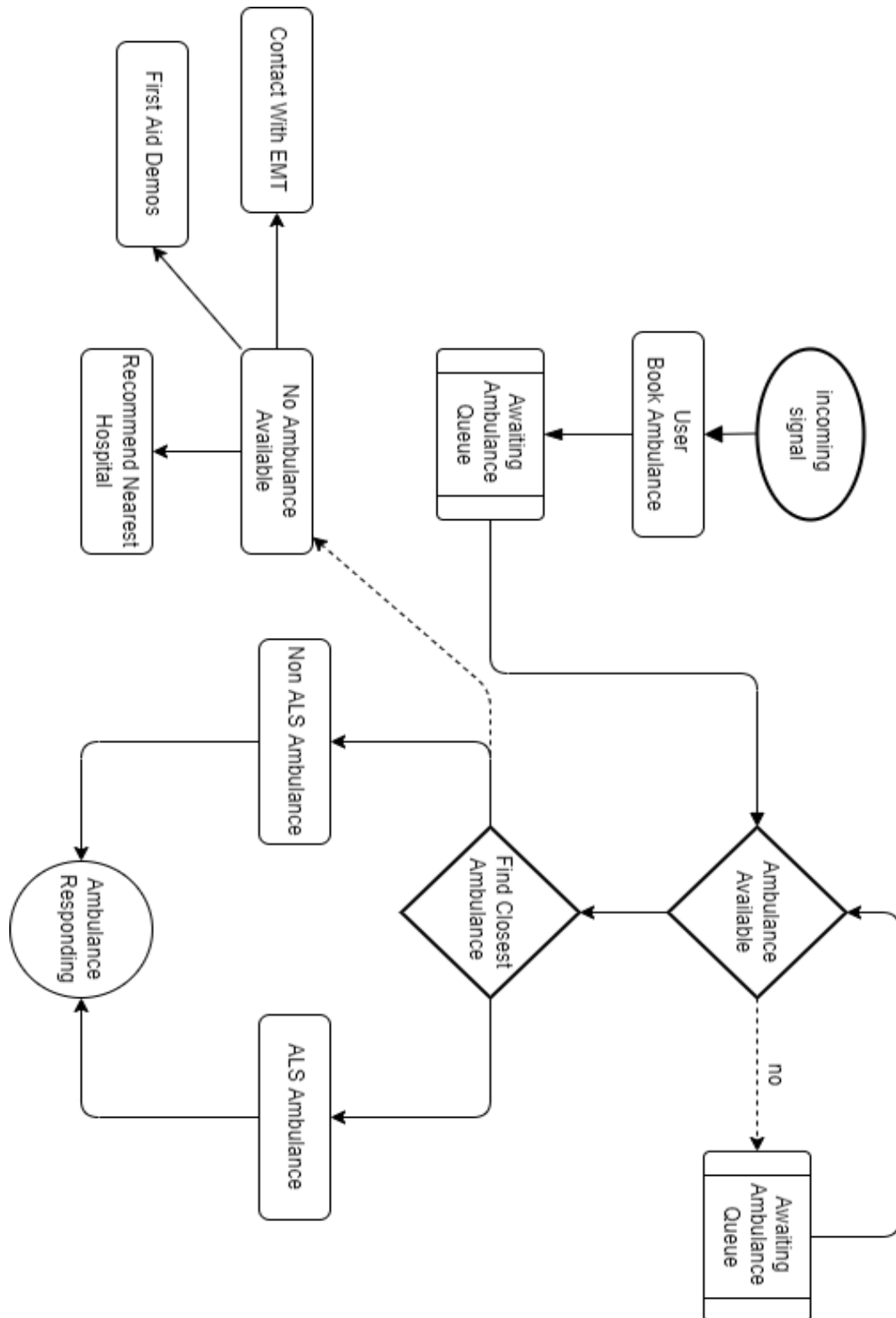


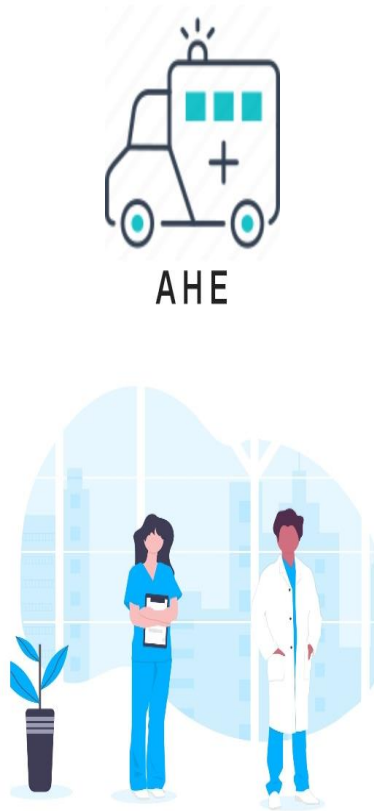
Figure 5.3.1: Data Flow diagram

CHAPTER 6

DESIGN MANUAL

This chapter describes the design manual of AHE Fast Ambulance Service.

6.1 FRONT HAND SCREEN SHOT



Fast Ambulance Service

Get Started

Home Screen



Sign Up

Sign in

Get Medical Assistance Now !

Figure 6.1.1: first page

Figure 6.1.2: sign up & sign in



AHE



Please Enter Your Name

Mobile Number

New Password



Confirm New Password

Sign Up

Already have an account ? Sign in !

Figure 6.1.3: sign up form



AHE

Verify it's You !

Enter Verification Code



Verify

Didn't get code ? Resend code

Figure 6.1.4: verification OTP

Mobile Number

Password

Sign in

Forgot Password ?

Don't have an account ? Sign Up !

Figure 6.1.5: sign in form

User01
030x-xxxxxxx

Profile

Home

Alerts

Notifications

Dialogue

Signout

Figure 6.1.6: Drawer of APP

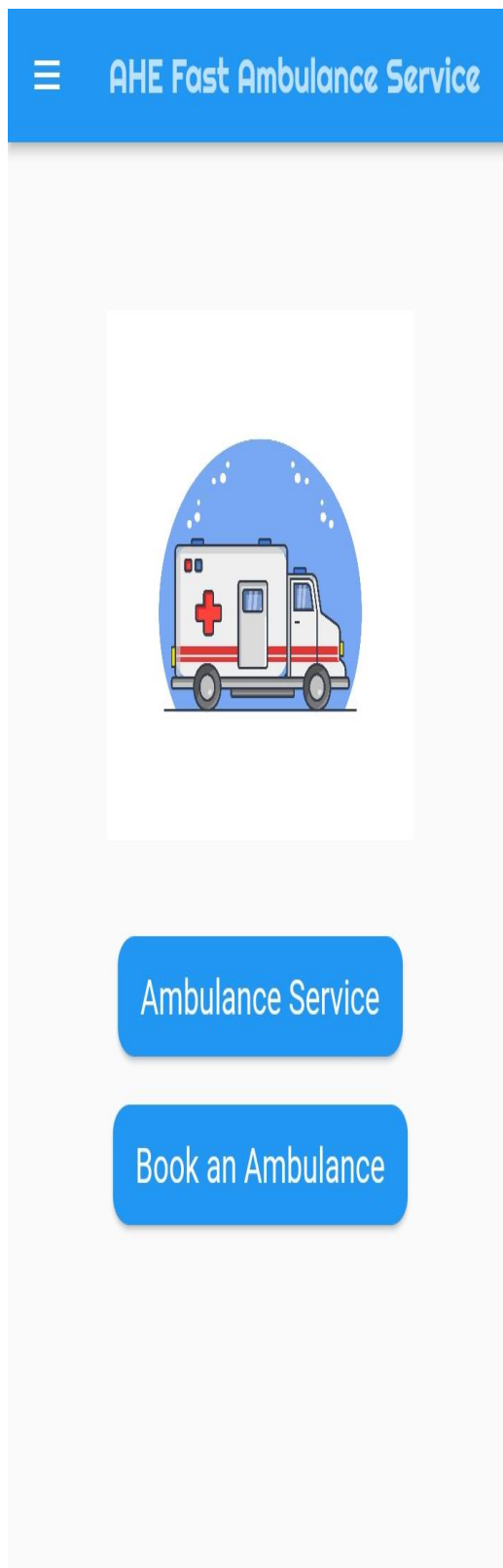


Figure 6.1.7: main page of app

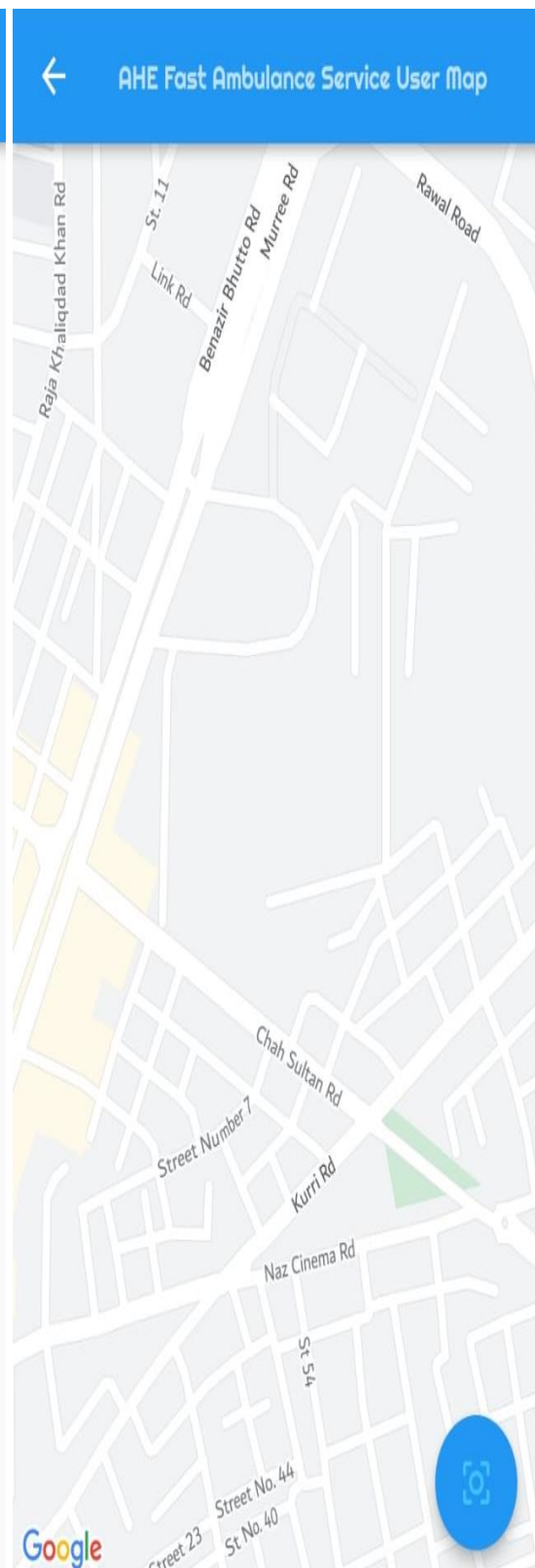


Figure 6.1.8: google map

CHAPTER 7

CONCLUSION AND FUTURE WORK

7.1 CONCLUSION

The project entitled AHE fast ambulance mobile application was completed successfully. The system has been developed with much care and free of errors and at the same time it is efficient and less time consuming. The purpose of this project was to develop a mobile application for booking ambulance quickly in emergency situation. This project helped us in gaining valuable information and practical knowledge on several topics like designing mobile app using dart, firebase and google map usage of responsive templates. The entire system is secured. Also the project helped us understanding about the development phases of a project and software development life cycle. We learned how to test different features of a project. This project has given us great satisfaction in having designed a mobile application which can be implemented to any nearby ambulance service to facilitate user by simple modifications.

7.2 FUTURE WORK

There is a scope for further development in our project to a great extent. A number of features can be added to this system in future like providing pre booking option of ambulance. The versions of mobile application enhanced with the passage of time. Another future work can be that this software application can be design for a specific organization

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