EMTS

(EMERGENCY MEDICAL TRANSFER SERVICE)

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CERTIFICATE OF CORRECTION & APPROVAL

This is to officially state that the thesis work contained in this report titled **"EMTS" (Emergency Medical Transfer Service)** *Is carried out by:* **Muhammad Haseeb, Waqas Ahmad, Abdul Aahad, Nisar Almas** *under my supervision and that in my judgment, it is fully ample, in scope and excellence, for the degree of Bachelor of Computer Software Engineering from National University of Sciences and Technology (NUST).*

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ABSTRACT

Since mobile phones have become an intrinsic part of our daily lives, why not use them to save our time and effort in a new way. The traditional ways of emergency handling service is based on calling an ambulance through calling the respective ambulance service. Users' needs to wait for the helpline and then provide there location.

To trace the location provided by the user and reach the pin point location is the most difficult job for the ambulance drivers, additionally there may arise navigation issues while navigating to the incident location.

EMTS will be an Android based application that will automate the whole process of calling an ambulance through mobile phone. User can call ambulance from any remote area by providing his location. User is assigned the nearest driving operating in that area. Once the driver receives the calling request, he can accept the booking request and navigate to the location provided by user.

This way EMTS will provide all emergency incidents handling services that will be precise, accurate and with the required speed to save the precious lives of the individuals

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Chapter 1

1 Introduction

The current Ambulance System in Pakistan is based on the cumbersome process in which users have to give the incident information like location by call that causes a lot of incidents to result in severe consequences.

In this project we develop a comprehensive solution that shall not only maximize the speed of the process but also shall provide supportive measures like First Aid.

EMTS will be an Android based application that will automate the whole process of calling an ambulance through mobile phone. User can call ambulance from any remote area by providing his location. User is assigned the nearest driving operating in that area. Once the driver receives the calling request, he can accept the booking request and navigate to the location provided by user.

This way EMTS will provide all emergency incidents handling services that will be precise, accurate and with the required speed to save the precious lives of the individuals of the society.

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1.1 Intended Audience and Reading Suggestions

This document is meant for all the stake holders.

- **Project Supervisor:** It will assist to supervise the project and guide the group available by better manner.
- **Development Team:** It will assist the developer to develop the appliocation and to discover back the functional requirements.
- **Testing Team:** It yearn for assistance to testers to comprehend the constraints.
- **Complainers (Users):** The likely participants of the product, who are interested in calling ambulance through using there Android Phone.
- **UG Project Evaluation Team:** Assessment board which will evaluate the assessment and evolution of UG Projects.
- **Staff:** The intended audience is both higher management and local officials of the different departments, who will update the complaint-status after its resolution.

1.2 Motivation

Since mobile phones have become an intrinsic part of our daily lives, why not use them to save our time and effort in a new way. The traditional ways of emergency handling service is based on calling an ambulance through calling the respective ambulance service. Users needs to wait for the helpline and then provide there location.

To trace the location provided by the user and reach the pin point location is the most difficult job for the ambulance drivers, additionally there may arise navigation issues while navigating to the incident location.

As Careem and Uber are operating intended to the intent of offering cab essential services. We need to design a system that will provide emergency services in the same fashion with accuracy and speed.

1.3 Project Vision

We propose a system that will provide core functionalities i.e. ambulance booking. This application provides access to the nearest ambulance available that is operating in that specific area.

- User launches app and provides its location
- Driver receive the request and accepts it
- User can see ambulance location in real time and can contact him

This way EMTS will provide all emergency incidents handling services that will be precise, accurate and with the required speed to save the precious lives of the individuals of the society

1.4 Project Objective

1.4.1 Primary Objectives:

1. Mobile platform for ambulance booking
2. Minimize the time of calling ambulance and incidents handling
3. Minimized time & effort to book ambulance.
4. To provide precise location sharing between the user and driver of the ambulance.

1.4.2 Academic objectives:

1. Development of an android based application for end users.
2. To have a good hand on using the cloud services i.e. Firebase database
3. To automate the emergency services operating in the society
4. Introducing a shared medium for patients, hospitals and emergency handling services.

1.4.3 Application / End – goal objectives:

1. To facilitate the end users of the application in terms of ambulance services.
2. To enable hospitals to handle there ambulances accurately and on time.
3. To save the precious live of the individuals of the country and society.
4. To enable the hospitals to keep a track of the there ambulances.

1.5 Deliverables

1. Complete working project
2. Android application
3. Documentation
4. Video of working of Project

Chapter 2

2 Literature Review

2.1 Introduction

Careem and Uber are operating in our country for the purpose of providing cab services. We can adopt the same mechanism to develop an android application for emergency and medical transfer services of the patients.

Conventional procedure of booking ambulance was used back many years and different procedures and methods were followed in different times. EMTS will be an advancement of existing setup of booking ambulance, saving time and effort. The main intention of the project is to set up a system in form of Android application that will automate the whole process of calling an ambulance through mobile phone. User can call ambulance from any remote area by providing his location. User is assigned the nearest driving operating in that area. Once the driver receives the calling request, he can accept the booking request and navigate to the location provided by user.

2.2 Problem Domain

Keeping in view the current ambulance booking service, a citizen needs to call ambulance by calling through their landlines or other calling service. User may incur many problems in the process of booking the ambulance.

This process incurs many problems, like:

1. Inability of the user to convey the desired location of the incident through a cell phone.
2. Inability of the driver of ambulance or hospital authorities to understand the type of ambulance needed, the severity of the injury at the pinpoint location.
3. Conventional process is time consuming and slow.

It urges the use of modern technology to minimize the effects of this existing disparity by making an android–based application to enable the users to call ambulance through their cell phones by calling ambulance through the usage of an automated system.

2.3 Related Work

Currently there is no system working that provides the services of calling ambulance and handling of emergency services. Careem and Uber are operating in our country for the purpose of providing cab services. We can adopt the same mechanism to develop an android application for emergency and medical transfer services of the patients.

Project Objectives that distinguishes our solution from the others:

1. "EMTS" becomes the pioneer in Pakistan to provide all hospitals and emergency handing services an automated system
2. Our application can be deployed in across different hospitals and welfare organizations such as Rescue1122, Edhi etc.
3. It will provide a milestone in the field if medicines and transport.
4. Will minimize the gap of communication between the user and the driver of the ambulance.
5. To develop an automated system for the hospitals and the ambulance services to facilitate the patients in new concise and precise way.
6. Will minimize the time required to book an ambulance in accurate and precise

2.4 Shortcomings/issues

1. Internet connection is essential for the working of EMTS on android phone.

2. The application is for android based smart phones only.

3. Location accuracy depends upon the quality of the user's mobile set.

4. For earlier versions, the contents of the application will be in English language only.

5. Currently we are using non paid cloud services that may be imprecise in terms of speed and services.

6. The server will not be available in case of maintenance and testing issues. No backup server configuration is provided.

2.5 Proposed Project

This mission is concerning the online Ambulance and First Aid Android mobile Application, it 'clone application of UBER and AMBULANCE but it has some additional functionality i.e. when Accident happens during the waiting time for arrival of ambulance user can get help from First Aid.

EMTS will be an advancement of existing setup of booking ambulance, saving time and effort. The main intention of the project is to set up a system in shape of Android mobile based application that will automate the whole process of calling an ambulance through mobile phone. User can call ambulance from any remote area by providing his location. User is assigned the nearest driving operating in that area. Once the driver receives the calling request, he can accept the booking request and navigate to the location provided by user.

2.6 Deliverables

2.6.1 Software Requirement Specification (SRS)

The purpose of the document is towards the introduction of a comprehensive picture of the EMTS. It describes the persistence and characteristics of the system, the interfaces, the boundaries of the system, whatever the product will do, its processes and workings, noted that the constraints by which it ought to operate and how the system is going to act in response to exterior stimuli. This paper is intended for developers and the participants of the system. It shall describe how the system will primarily aid concerned groups to team up and cooperate with each other.

2.6.2 Software Architecture Document

In this document the overall architecture of the system is discoursed, also including the introduction of various components and subsystems. It is chiefly braced by system Architecture

diagram which depicts an insider's viewpoint of the system by unfolding the high-level software components that execute the major functions to make the system operational.

2.6.3 Software Design document

The Software Design Document is a record to give documentation that shall be utilized to help in programming advancement by giving the subtleties to how the product ought to be fabricated. Inside the Software Design Document are narratives and graphical documentation of the product plan for the task. It covers every single practical prerequisite and shows how they communicate with one another adroitly. The low-level design additionally appears with respect to how really we have been executing how we are going to actualize these requirements.

2.6.4 Implementation code Document

The implementation code document provides details about the pseudo code for the application and project prototype.

2.6.5 Software Testing Document

This document has testing modules in which there are certain test cases which depicts the correctness and accuracy of the project.

2.6.6 Final Project Report

This is the thesis report which compiles all the previous and current working for the project. Thesis report provides the whole summary for the project and also give details about each and every aspect of the project starting from introduction of the project, literature review, requirements leading to design discussions then testing and lastly future work and conclusion.

2.6.7 User Manual

User Manual gives details about the use of the product. It contains details as how to use the product. Its functionalities and details of every aspect as how that works and how to use it. User Manual is for users to get to know the product.

2.7 Technological Requirements

EMTS entails subsequent software and hardware requirements specifications.

2.7.1 Software Interfaces

1. The app will require access to the device GPS, and request permission for location tracking via the Android Operating System
2. EMTS shall work on Firebase database management system.
3. EMTS app shall be able to execute on all android devices with basic hardware requirements fulfilled that run Android OS 5.0 or above.
4. The app will require access to the device camera and request permission to access gallery or take pictures via the camera through Android Operating System.

2.7.2 Hardware Interfaces

2.7.2.1 Mobile Device

The hardware, software and technology used must possess the subsequent specifications:

1. Android Device (Smartphone or Tablet) running Android 5.0 or later, color display.
2. Touch Screen with haptic feedback on key presses (Android Keyboard).
3. Global Positioning System.
4. Operating System: Android
5. Capability to link to Wi-Fi or mobile communication network.

6. Capability to exchange information across the network.
7. Touch screen intended for accessibility or keypad (if touch pad is not accessible)
8. Processor that possess the speed of 1 GHz
9. Ability to use Location services Google maps and other services of mobile.
10. Ability to take over input from user
11. Device needs to have at least 512 MB of RAM

2.7.3 Communications Interfaces

1. A connection shall be established between the System and the cloud services of Firebase.
2. To access the services of the application we need to establish connection between the application running on mobile device and firebase database cloud computing.
3. Communication between application and the database is provided by cloud services of Firebase.

2.7.4 Programming Interface

Programming interfaces for project are:

1. Android Studio
2. Visual Studio

Chapter 3

3 Overall Description

3.1 Product Perspective

The current Ambulance System in Pakistan is based on the cumbersome process in which users must give the incident information like location by call that causes a lot of incidents to result in severe consequences.

In this project we develop a comprehensive solution that shall not only maximize the speed of the process but also shall provide supportive measures like First Aid.

3.2 Product Functions

Following are the key functions of the Emergency medical and transfer service (EMTS):

3.2.1 User Profiles

EMTS registers every user and maintain their records.

3.2.2 Ambulance Access

This application provides access to the nearest ambulance available that is operating in that specific area.

- User launches app and provides its location
- Driver receive the request and accepts it
- User can see ambulance location in real time and can contact him

3.2.3 Assignment of nearest driver to calling user

The system shall assign nearest driver to the user that requested for booking the ambulance

3.2.4 User and Driver Location identification

The system will get the location of the user and the driver of the ambulance, using Android device's Global Positioning System. In case of unavailability of GPS or otherwise too, the user can manually add the location in the Pickup-location by inputting co-ordinates.

3.2.5 Login/Access Right

EMTS will allow users to login, based on their roles. User of the application can either sign-in as user or driver.

3.2.6 Ambulance booking medium

EMTS will provide support for booking requests to be sent through using internet. Users must get the real-time location of driver and the driver shall see the user in real time on the map.

3.2.7 Feedback/Comment/Issues

EMTS will provide Feedback facility about the driver behavior and quality of service to improve the service providence to the users of the mobile application.

3.3 User Classes and Characteristics

The software has two types of users i.e. passenger and Driver. These two categories of users shall be provided with different access level to the system and its data and can perform functions assigned to their respective roles.

- **Driver: -** Drivers can sign-in as a driver. Drivers can accept or reject the ambulance booking request from a remote area of operation. Drivers are assigned to the users through nearest distance and radius of the operational area of the driver and user.

Public User: - This will form most of the users of the system and comprises a wide multiplicity of people. This category of user will be able to use the application for accessing nearest ambulance available that is operating in that specific area.

- User launches app and provides its location
- Driver receive the request and accepts it
- User can see ambulance location in real time and can contact him

3.4 Operating Environment

OE-1: EMTS back-end utility i.e. online server that can be bought and database can be maintained there. All the data will be accessed on the cloud server and data manipulation can be done on the same server.

OE-2: EMTS will be managed with Firebase database management system.

OE-3: EMTS will run on any Android smart phone with a working internet connection.

OE-4: The hardware, software and technology used should have following specifications:

- Operating System: Android
- Capability to link to Wi-Fi or mobile communication network.
- Capability to exchange information across the network.
- Touch screen intended for accessibility or keypad (if touch pad is not accessible)
- Processor that possess the speed of 1 GHz
- Ability to use Location services Google maps and other services of mobile.
- Ability to take over input from user
- Device needs to have atleast 512 MB of RAM

3.4.1 Technology Platform:

3.4.1.1 Android-Based Front End:

EMTS's front-end would be developed for android-based smart phones, providing the users with the interface to get registered on the server, and book ambulances. Android development tools (Android Studio) would be used as the development environment.

3.4.1.2 Programming languages:

1. Java

3.4.1.3 Programming Environment

1. Android Studio

2. PHP Storm

3. Visual Studio

3.4.1.4 Database

1. Firebase Database

3.5 Design and Implementation Constraints

C-1: Android compatible platform, Java based, is needed for the end-user.

C-2: Deficiency of customer-skill in using the product on Android cellular device.

C-3: Internet connectivity required.

C-4: Use of English language as the main methods for correspondence in the system.

C-5: Location access using GPS is required.

C-6: Create account by inserting and authenticating mobile number

Network connectivity issue:

C-7: in case of inability to exchange data using the network, trigger error message Connection not available

C-8: if there should arise an occurrence of not capable to access services of mobile hardware

C-9: If e.g. device location services unavailable, trigger error message i.e.can't access device location

CO-11: Database: Firebase database system

3.6 User Documentation

UD- version 1.0 :Ultimate publication shall be complemented with a user manual to enlighten users how to use EMTS. User documentation that would be delivered along with the final product

- User manual

3.7 Assumptions and Dependencies

AS-1: Basic assumption for development of EMTS is that system should be available 24/7 since user can call ambulance at any time.

AS-2: The users shall not misuse the application by sending false ambulance booking requests that will affect the operation of the application.

AS-3: Drivers shall remain in operational mode during working hours and shall accept every ambulance booking requests except technical issues in the ambulance.

AS-4: The people are willing to use application for booking ambulance.

AS-5: The server shall be able to take care of large numbers of requests especially when initially launched, as there will be number of ambulance booking requests.

AS-6: it is assumed that users of EMTS have an Android smart phone accompanied by internet access.

D-1: EMTS shall be permanently dependent on the internet access without internet the application cannot be launched and used for booking ambulance.

D-2: EMTS shall be entirely dependent upon the cloud server for 24/7 access as our database system resides on the Firebase cloud server.

D-3 EMTS shall be entirely dependent on GPS services for precise location detection of the user while sending ambulance booking requests and for drivers while accepting booking requests.

Chapter 4

4 Software Requirements Specification

4.1 System Features

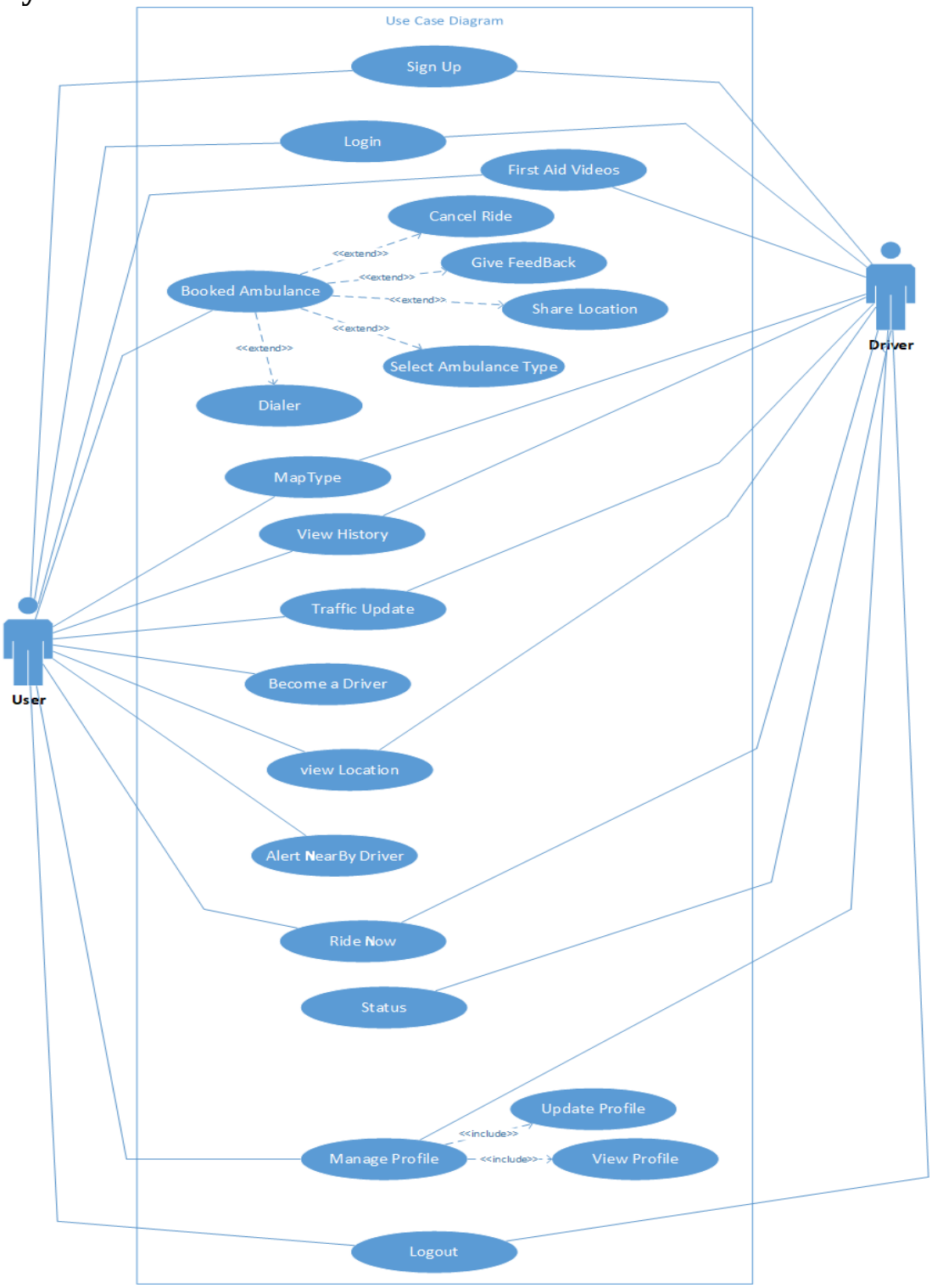

Figure 01-Use Case Diagram

4.1.1 Use Case UC1: Sign Up

User Can sign up to the application. Every user is registered in the central database and credentials are maintained for the registered users

4.1.2 Use Case UC2: Login

Users of EMTS can Login to the system only if they are already registered that way its provides the authentication of credentials of legitimate users.

4.1.3 Use Case UC3: Select ambulance type

User can select different types of ambulance from a list of ambulances according to the severity of the incident and perspective of injury or emergency.

4.1.4 Use Case UC4: View History

User and driver can check their ride history for monitoring and control.

4.1.5 Use Case UC5: Become Driver

User of application can select to become a driver that enables the driver to accept/ reject ride requests.

4.1.6 Use Case UC6: Give Feedback

User of application can give feedback regarding the ambulance service, about a specific booking and can give us feedback to improve the quality of service.

4.1.7 Use Case UC7: View Location

User and drivers can see each other’s location once the booking request is processed.

4.1.8 Use Case UC8: Alert nearby Driver.

Once User select to call ambulance from a remote area, nearby driver is assigned to the user operating in that specific area depending upon the radius of the area.

4.1.9 Use Case UC10: Status

Drivers can turn-on/off their status for receiving ambulance booking request.

4.1.10 Use Case UC10: Update user Profile

User can update their profile in case any changes made to their credentials.

4.1.11 Use Case UC11: Update Driver Profile

User can update their profile in case any changes made to their credentials.

4.1.12 Use Case UC12: View User Profile

User can view into their profile that provides them the interface to check-in their credentials.

4.1.13 Use Case UC13: View Driver Profile

User can view into their profile that provides them the interface to check-in their credentials.

4.1.14 Use Case UC14 : Cancel Ride

Users can change their mind during ambulance booking and they can cancel the booking.

4.1.15 Use Case UC15: Logout

System intend to permit user to logout of the application successfully.

4.2 Other Non-functional Requirements

4.2.1 Performance Requirements

- Application ought to be light weight and need to send pick up requests and booking requests instantly.
- The front-page load time must be no more than 2 seconds for users that access the application using an LTE mobile connection.
- High Specs android phones shall be able to run the application
- A secure transport shall be a friendly advantage for user to believe on service.
- Application can handle many Drivers and users at a time

4.2.2 Safety Requirements

- Application shall handle any user's information safely.
- Users must have to register using original information so that if any mishap occurs service shall provide him as much support as possible.
- User credentials and private info shall not be shared with the rest of the users.

4.2.3 Security Requirements

- Only authorized users can modify their profile and booking information.
- The system shall not be accessed by any unauthorized person.

4.2.4 Software Quality Attributes

- **Availability:** System shall be operating on any time during working hours of the service and can manage more than one ride at a time.
- **Reusability:** The components of the system shall be written in a way that they are easy to reuse.
- **Reliability:** The system defect rate shall be as less as possible.

4.2.5 Business rules:

- Application provides ambulance services and first aid services that are provided by different hospitals and organizations.
- User must register to the application to use the services.
- Ambulance services operates according to rules of health organizations.

4.3 Software Quality Attributes

Quality attributes of EMTS are portrayed underneath. In the wake of these characteristics, the quality of EMTS shall be enhanced.

4.3.1 Runtime System Qualities

At execution EMTS ought to offer its users with features that they can publish and search for the desired services. Some of the qualities that needs to be counted in the development of EMTS are portrayed here.

4.3.1.1 Functionality

EMTS must provide functions to publish and search the different services. EMTS ought to offer the feature of authentication of user.

4.3.1.2 Availability

EMTS should be available 24/7 since the complaint can be lodged at any time. If at all system is down so the servers will take about 15 minutes to start the EMTS again.

4.3.1.3 Usability

Usability is an important criterion in the development of EMTS. The system should present all functionalities in such a way that nothing is missed by the user. The graphical user interface of app is to be designed with usability as the priority. The app will be presented and organized in a manner that is both visually appealing and easy for the user to navigate.

4.3.1.4 Non-Runtime System Qualities

These are characteristics of EMTS which are required to make this software useful for further enhancements. It will also be helpful in future development as well as extending system to different environments.

4.3.1.5 Modifiability

EMTS ought to support modifiability incase any further enhancements or features are effortless to incorporate.

4.3.1.6 Portability

The system should work on WIFI as well as 3G network.

EMTS should be capable to operate on various mobile gadgets that are operating via android operating system.

4.3.1.7 Testability

Various quality assessments ought to be executed so that EMTS is exempt of flaws and operate agreeing to requirements.

Chapter 5

5 System Design Specifications

5.1 System Architectural Design

Layard architecture will be used with each layer providing a set of functionalities. These layers will be composed of multiple services which will communicate with each other via message passing. Abstractly, the services can be observed as components of the complete solution. Though, on the inside, each facility is made up of software components, exactly as any other application, additionally these components can make use of each other without being aware of the internal implementation

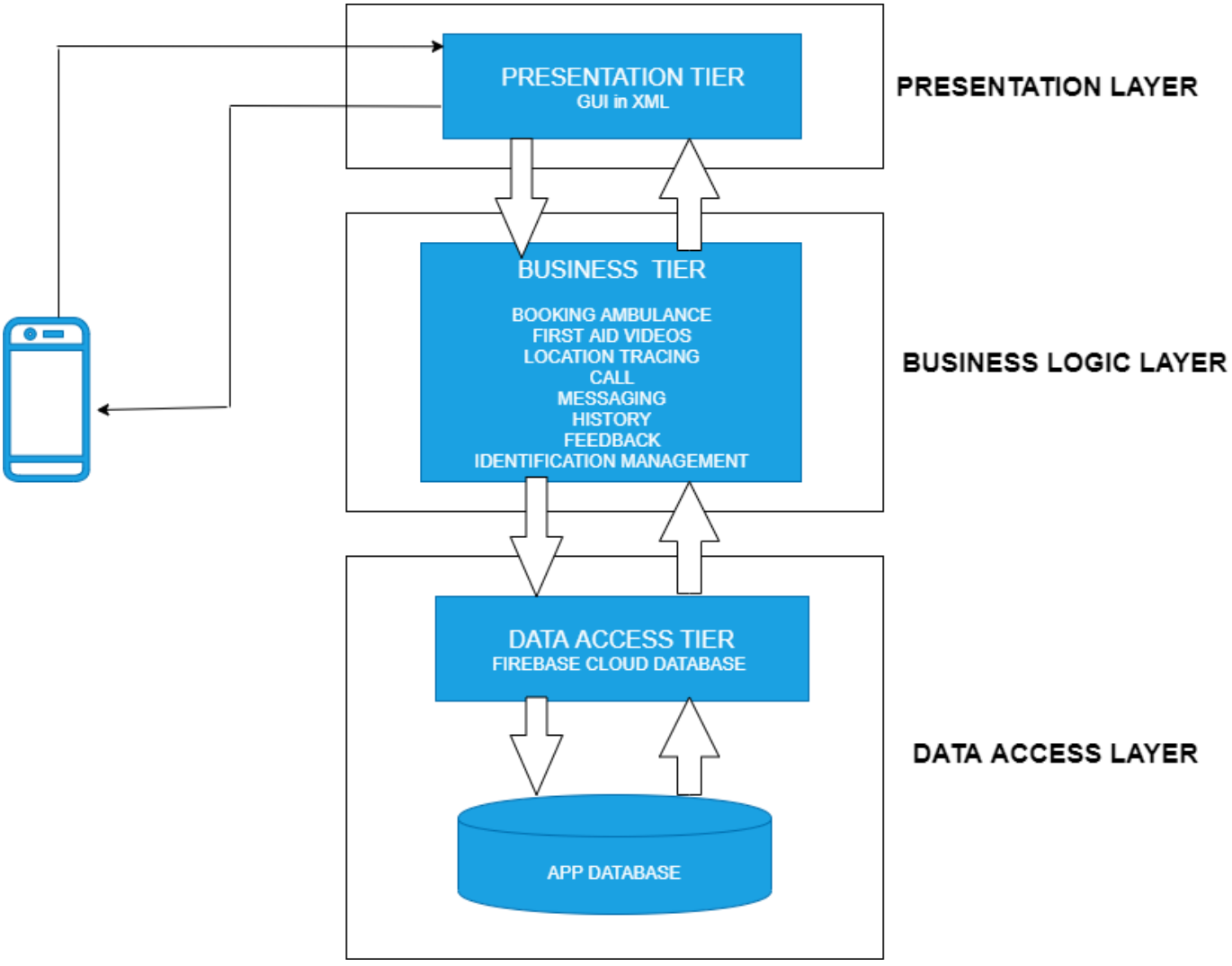

Figure 2 System Architecture

5.1.1 Presentation Layer

This layer act as a manifesto for the communication of the user and system. This layer presents data to the user and recognizes input from the user.

5.1.2 Business Logic

It provides the core functionality to application which a user is required to have from the application.

5.1.3 Data Access Layer

This layer entertain the request from the Service Layer and sends report back data after querying from the database server.

5.2 Class Diagram

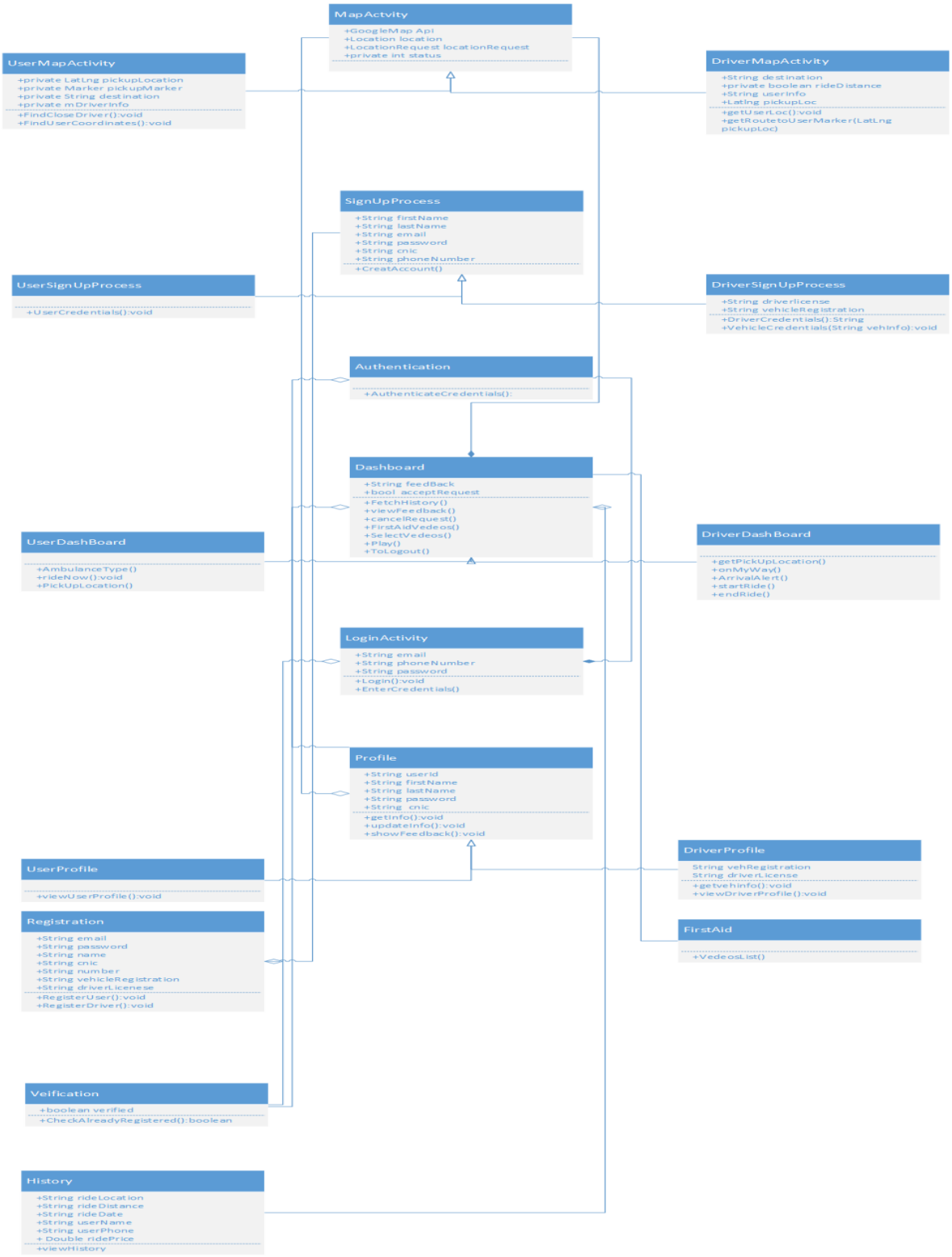

Figure 3 Class Diagram

The description for class diagram is shown on the next page:

Class name	**Description**
	App class contains all the information that EMTS has to perform. It is the main class which will be acting as a gateway to all the other classes
Maps	This class contains the map information including the locations of the users and drivers and their markers it is inherited by two sub classes UsersMapActivity and DriversMapsActivity both showing the map related information of Drivers and Users
SignUp and Login	This class contains the functions for sign in and sign up processes for the users and **drivers**.
System interface	It contains all the information to enable user to interact with EMTS. It has links to all the functions of different classes that on selection lead to different actions.
Dashboard	It contains the functions with intents to the Profile and FirstAand and also Logging out of the application
Registration and Authentication	Registration and verifications are included as the functions in the signup and registration class Registration is to save data in

	database and verification is to verify the stored data at the time of the login.
Driver Profile and User Profile	Driver profile saves the information including Name Ambulance Number,Picture,Ambulance type and phone Number of the Driver and User Profile saves Name and phone Number of the user .
FirstAid	This class contains the menu to if the FirstAid Videos and is used by other classes implementing the functionality of the video player to play those FirstAid Videos described in the menu

Table 1 System Features

5.3 Use Case Diagram

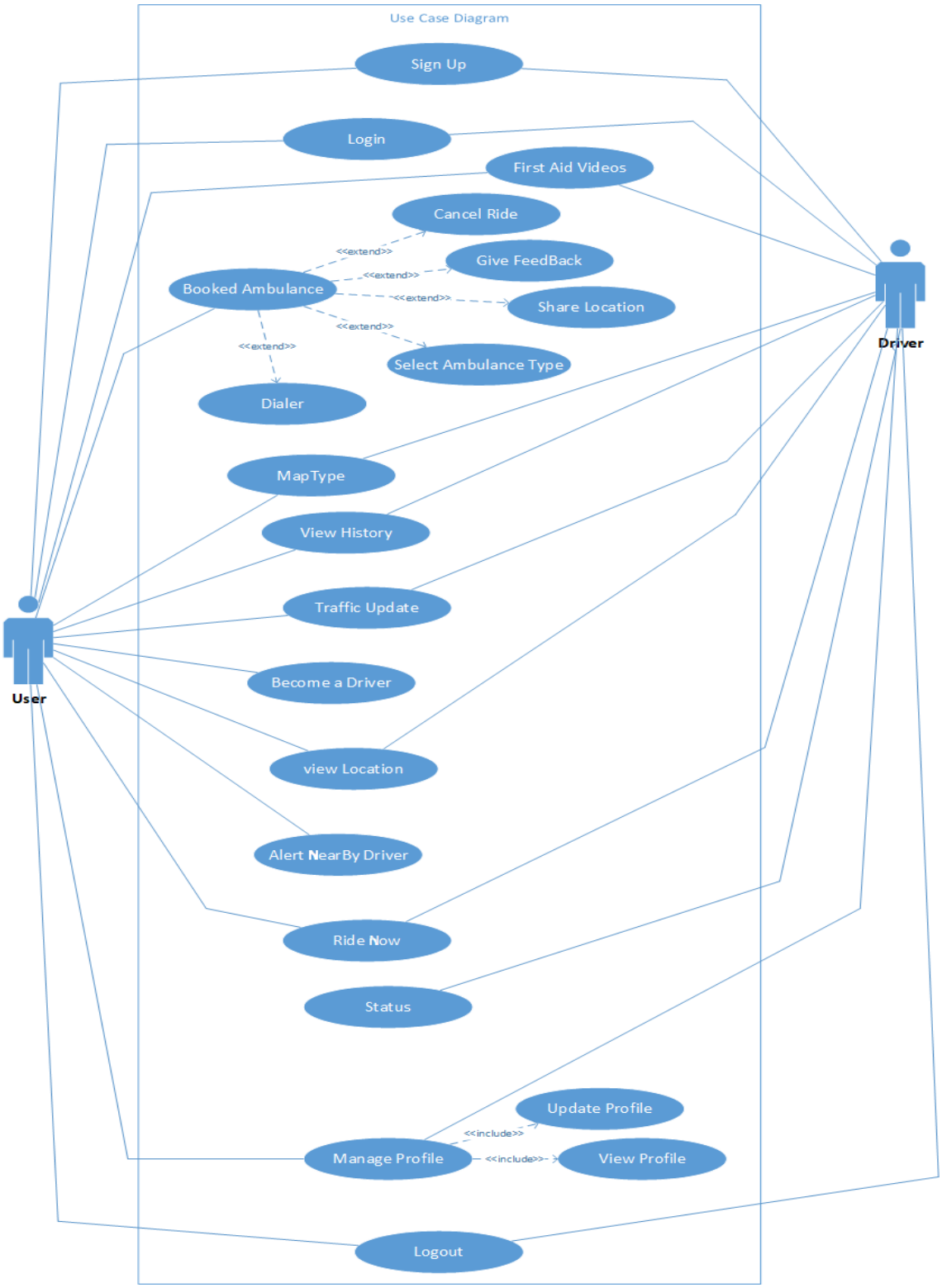

Figure 4 Use Case Diagram

5.3.1 Use Case UC1: Sign Up

Name: Sign up

Scope: EMTS

Primary Actor: Unregister User

Description: First, user install the app, after opening the android application the Sign Up and Log In form shall be shown to the user. After filling the required information, the system records the fields of data into database and user gets registered.

Stakeholders and Interests: Unregister user: User must sign up to register their account.

Preconditions: Must have android application to register.

Success Guarantee (Post conditions): Unregister user shall get registered after they provide the valid information.

Main Success Scenario: Following Table 3.1 shows main success scenario.

User:	***System:***
Step 1: User requests to create an account click "Create Here "button.	***Step 2: The system shall show Sign Up form.***
Step 3: User enters the detail e.g. first name, last name, Email, Mobile number and CNIC number click "Register Now button.	***Step 4: The system shall redirect to main dashboard.***
Step 5: The user shall confirm the information.	***Step 6: The system creates the user account.***

Table 2 Sign-Up

Extension

In extension we explain the alternative scenarios of use case.

Alternative Flow 1: Username/email already exists

- System displays a message that the email already exists.
- System asks the user to enter another username/email.

Alternative Flow 2: Invalid email ID

- System displays a message that the email is invalid.
- System asks the user to enter a valid email id.

Alternative Flow 3: Mismatched passwords

- System displays a message that the password does not match.
- System asks the user to enter the password again.

Alternative Flow 4: Invalid username/password/email format

- System displays a message that the format is invalid.

5.3.2 Use Case UC2: Login

Name: Login

Scope: EMTS

Primary Actor: Registered user

Description: The user opens the application and is directed to the login and signup form then user enters its credentials and system shall successfully login the user.

Stakeholders and Interests: Registered user: User must login to their account.

Preconditions: User must have their account.

Success Guarantee (Post conditions): User can access that application and user can book ambulance now.

Main Success Scenario: Following Table shows main success scenario.

User:	*System:*
Step 1: User requests to login to their account.	***Step 2: The system asks for details and provides login form.***
Step 3: User enters the detail e.g. username and password and press the login button.	***Step 4: The system shall confirm the username and password from existing database.***
	Step 5: If the username and password matches, then system login to the user account otherwise show message of invalid username/password and try again.

Table 3 Login

Extensions:

In extension we explain the alternative scenarios of use case.

Alternative Flow 1: Username/email doesn't exist

- System shows the message that user name you entered does not exist.
- System asks the user to enter the valid username.

Alternative Flow 2: Wrong Password

- System shows the message the password you entered is wrong/incorrect.
- System asks the user to enter the correct password.

Alternative Flow 4: User already login

- User exits in login list so use case end.

Alternative Flow 5: GPS is off

- If user doesn’t on the GPS, the location do not show to the users. User must on GPS.

5.3.3 Use Case UC3: Select ambulance type

Name: Select ambulance type

Scope: EMTS

Primary Actor: User

Description: User want to book ambulance, first of all choose the ambulance type and getting the driver.

Stakeholders and Interests: User: User can select any ambulance.

Preconditions: User must login to the application.

Success Guarantee (Post conditions): User can access that application and start rides.

Main Success Scenario: Following Table 3.3 shows main success scenario.

User:	*System:*
Step 1:The user request to check the ambulance types.	***Step 2: System shall show the ambulance types to user.***
Step 3:select the ambulance type from down up button.	***Step 4: If selected ambulance service is available on map then, show message to get your driver.***

Table 4 Select Ambulance Type

Extensions:

In extension we explain the alternative scenario of use case

Alternative Flow 1: Users are not available.

- If users are not available, system show message ambulance service not available.
- Choose another ambulance service.

Alternative Flow 2: Data loading error occur

- If data loading error occur, then check your internet connection.
- Show message to user ‘Must have internet’.

5.3.4 Use Case UC4: View History

Name: View History

Scope: EMTS

Primary Actor: registered user

Description: if user had some bookings and want to see his/her history .

Stakeholders and Interests: Registered User: user can check the previous ambulance booking history.

Preconditions: User must login to the application, identified and authenticated.

Success Guarantee (Post conditions): User can access that application and see ambulance booking history.

Main Success Scenario: Following Table 3.5 shows main success scenario.

User:	*System:*

Step 1:The user selects history button icon.	***Step 2:System shall show the total history of drive.***
Step 3:User click on view history.	***Step 4:If history exist, then system shall show all drive history.***

Table 5 View history

Extensions:

In extension we explain the alternative scenario of use case

Alternative Flow 1: History not available

If user doesn't use App, then there shall be no history available to the users.

Alternative Flow 3: Data loading error occur

- If error occur data loading, then check your internet connection.
- Show message to user 'Must have internet'.

5.3.5 Use Case UC5: Become Driver

Name: Become Driver

Scope: EMTS

Primary Actor: Registered User

Description: User can become a Driver and as well as user, if user wants to become a Driver, then full fill the requirements, ambulance number License number, CNIC etc.

Stakeholders and Interests: Registered User: user can become a Driver.

Preconditions: User must login to the application, identified and authenticated.

Success Guarantee (Post conditions): User can access that application and become Driver.

Main Success Scenario: Following shows main success scenario.

User:	*System:*
Step 1:The user click menu.	***Step 2:The system shall display the option "Become Driver.***
Step 3:User click on 'Become Driver'	***Step 4:System shall show the forms to full fill the requirements.***

Table 6 Become Driver

Extensions:

Alternative Flow 1: User doesn't have correct information

If user doesn't have license or registration of ambulance, then he shall be prompted by the app to first get a license or register ambulance.

5.3.6 Use Case UC6: Give Feedback

Name: Give Feedback

Scope: EMTS

Primary Actor: User

Description: When user shall successfully login in to system and get ambulance, after completion of ride the user can give feedback to the Driver.

Stakeholders and Interests: Registered User: user can give feedback to the driver.

Preconditions: User must have to complete the ride.

Success Guarantee (Post conditions): User can access that application and give feedback to the driver.

Main Success Scenario: Following Table shows main success scenario.

User:	*System:*
Step 1:The user shall complete the ride.	***Step 2:The system shall show the feedback form***
Step 3:The user shall give feedback to the driver.	***Step 4:System store the feedback into the database according to driver ID.***

Table 7 Give Feedback

Extensions:

In extension we explain the alternative scenarios of use case

Alternative Flow 1: Does not complete ride.

- If user doesn't complete the ride, then user shall not give feedback to Driver.

Alternative Flow 2: Data loading error occur

- If data loading error occur, then check your internet connection.

5.3.7 Use Case UC7: View Location

Name: View Location

Scope: EMTS

Primary Actor: Registered user

Description: When user get ambulance then user can see real time location on google map.

Stakeholders and Interests: Registered User: users are able to view real time location.

Preconditions: User must login to the application, identified and authenticated and see real time location.

Success Guarantee (Post conditions): User can access that application and view location.

Main Success Scenario: Following shows main success scenario

Table 3.1Register user

User:	*System:*
Step 1:User requests to see real time location.	***Step 2:The system shall show the real time location to the user.***

Table 8 View Location

Extensions:

In extension we explain the alternative scenarios of use case

Alternative Flow 1: location information/GPS is off

- User cannot see location info if GPS services are off.
- Users needs to turn on the on the GPS.

Alternative Flow 2: User does not permit to use location services

- If user does not give permission to use access device location, then real time location cannot be show to the user.
- User must give permissions to use different services.

Alternative Flow 3: Data loading error occur

- If error occur data loading, then prompt message “check your internet connection”.

5.3.8 Use Case UC8: Alert nearby Driver

Name: Alert nearby Driver

Scope: EMTS

Primary Actor: User

Description: A user wants to book an ambulance; the application shall generate an alert to nearby drivers on the map

Stakeholders and Interests: User: To get nearby driver.

Preconditions: User must login to the application, identified and authenticated.

Success Guarantee (Post conditions): User can access that application and get nearby driver.

Main Success Scenario: Following Table 3.9 shows main success scenario.

User:	*System:*
Step 1:User press the button for ride.	***Step 2:The system shall show the nearest driver to the user.***
Step 3:driver shall receive an alert.	***Step 4:System alerts driver about user.***

Table 9 Alert Nearby driver

Extensions:

In extension we explain the alternative scenario of use case

Alternative Flow 1: Does not found Nearby Driver

- If user does not found nearby driver, then choose another ambulance type and try again.
- Either Drivers are not available in that area

Alternative Flow 2: Data loading error occur

- If error occur data loading, then check your internet connection.

- Show message to User ‘Must have internet’.

5.3.9 Use Case UC10: Status

Name: status

Scope: EMTS

Primary Actor: Driver

Description: Driver can turn on and off his status during work. If driver turn off the status, then location of the driver does not show on the map.

Stakeholders and Interests: Driver: Driver can turn off/on status.

Preconditions: Driver must login to the application, identified and authenticated.

Success Guarantee (Post conditions): Driver can access that application and turn on/off the status/location.

Main Success Scenario: Following Table shows main success scenario.

User:	*System:*
Step 1:The driver clicks on turn on status.	***Step2:The system shall show the driver on the map.***
Step 3:The driver clicks on turn off status	***Step 4:System shall remove the real time location of driver from map .***

Table 10 Status

5.3.10 Use Case UC10: Update user Profile

Name: Update user profile

Scope: EMTS

Primary Actor: User following

Description: User shall successfully login in to system can update profile.

Stakeholders and Interests: Registered User: User can update the profile.

Preconditions: User must login successfully .

Success Guarantee (Post conditions): User can access that application and update the profile.

Main Success Scenario: Following Table shows main success scenario.

User:	*System:*
Step 1:The user clicks on profile.	***Step 2:The system shall show user profile form.***
Step 3:The user shall press edit button.	***Step 4:System shall edit the record in edit text and show to the user.***
Step 5:User shall add the record and press update the button.	***Step 6:System shall update the record according to user ID.***

Table 11 update user profile

Extensions:

In extension we explain the alternative scenario of use case

Alternative Flow 1: Do not complete profile.

- If user doesn’t complete the profile the user shall not be able to use the app.

Alternative Flow 4: Data loading error occur

- If error occur data loading, then check your internet connection.

5.3.11 Use Case UC11: Update Driver Profile

Name: Update Driver profile

Scope: EMTS

Primary Actor: Driver

Description: Driver shall successfully login in to system can update profile.

Stakeholders and Interests: Registered Diver: Driver can update the profile.

Preconditions: Driver must login successfully .

Success Guarantee (Post conditions): Driver can access that application and update the profile.

Main Success Scenario: Following Table shows main success scenario.

User:	*System:*
Step 1:The Driver clicks on profile.	***Step 2:The system shall show Driver profile form.***
Step 3:The Driver shall press edit button.	***Step 4:System shall edit the record in edit text and show to the Driver.***
Step 5:Driver shall add the record and press update the button.	***Step 6:System shall update the record according to Driver ID.***

Table 12 Update driver profile

Extensions:

In extension we explain the alternative scenario of use case

Alternative Flow 1: Do not complete profile.

- If user doesn't complete the profile the user shall not be able to use the app.

Alternative Flow 2: Data loading error occur

- If error occur data loading, then check your internet connection.

5.3.12 Use Case UC12: View User Profile

Name: View profile

Scope: EMTS

Primary Actor: Registered User

Description: User shall successfully logins to system then the user shall View the profile

Stakeholders and Interests: Registered User: User shall View the profile.

Preconditions: User must login have to complete the profile.

Success Guarantee (Post conditions): User can access that application and update the profile.

Main Success Scenario: Following Table 3.13 shows main success scenario.

User:	*System:*
Step 1: The user clicks on view profile	***Step 2:The system shall show profile.***

Table 13 View User Profile

Extensions:

In extension we explain the alternative scenario of use case

Alternative Flow 1: Data loading error occur

- If error occur data loading, then check your internet connection.

5.3.13 Use Case UC13: View Driver Profile

Name: View profile

Scope: EMTS

Primary Actor: Registered Driver

Description: Driver successfully logins to system then the driver shall View the profile

Stakeholders and Interests : Registered User: Drive shall View the profile.

Preconditions: Drive must login have to complete the profile.

Success Guarantee (Post conditions): User can access that application and update the profile.

Main Success Scenario: Following Table shows main success scenario.

User:	*System:*
Step 1:The driver clicks on view profile	***Step 2:The system shall show profile.***

Table 14 view driver Profile

Extensions:

In extension we explain the alternative scenarios of use case

Alternative Flow 1: Data loading error occur

- If error occur data loading, then prompt message “check your internet connection”.

5.3.14 Use Case UC14 : Cancel Ride

Name: Cancel Ride

Scope: EMTS

Primary Actor: Registered User

Description: User books an ambulance and wants to cancel the booking.

Stakeholders and Interests: Registered User: User shall click on cancel ride.

Preconditions: User must login to the application and needs to book an ambulance.

Success Guarantee (Post conditions): Bookings of ambulance shall be cancelled**.**

Main Success Scenario: Following Table shows main success scenario.

User:	*System:*
Step 1: User books an ambulance.	***Step 1: System processes the request and allot an ambulance to the user***
Step 1: User clicks on Cancel booking or ride	***Step 2: System processes the cancel request and booking is cancelled***

Table 15 Cancel Ride

Extensions:

In extension we explain the alternative scenarios of use case

Alternative Flow 1: location information/GPS is off

- User cannot see location info if GPS services are off.
- Users needs to turn on the on the GPS.

Alternative Flow 2: User does not permit to use location services

- If user does not give permission to use access device location, then real time location cannot be show to the user.
- User must give permissions to use different services.

Alternative Flow 3: Data loading error occur

- If error occur data loading, then prompt message “check your internet connection”.

5.3.15 Use Case UC15: Logout

Name: Logout

Scope: EMTS

Primary Actor: Registered user

Description: The user must have logged in to the application.

Stakeholders and Interests: Registered user: user must have logged in to the application.

Preconditions: User must have a registered account

Success Guarantee (Post conditions): User shall be logged out of the application

Main Success Scenario: Following Table 3.19 shows main success scenario.

User:	*System:*
Step 1: The user requests to logout from their account.	***Step 2: The system will remove all listener from firebase.***
Step 4: User can check login activity.	***Step 3: The system will redirect to login activity.***

Table 16 Logout

Extensions:

In extension we explain the alternative scenario of use case

Alternative Flow 1: Data loading error occur

- If error occurs during data loading, then check your internet connection.

5.3.16 Use Case UC16: First Aid Videos

Name: First Aid Videos

Scope: EMTS

Primary Actor: Registered User

Description: After successful login to the system the user can use this feature for handling the accidental situations .

Stakeholders and Interests: Registered User: user can watch the First Aid videos.

Preconditions: User must login to the application, identified and authenticated and clicks on view First Aid Video module.

Success Guarantee (Post conditions): User can access First Aid videos

Main Success Scenario: Following Table 3.18 shows main success scenario.

User:	*System:*
Step 1:User clicks on First Aid Videos tab.	***Step 2:The system shall direct user to the First Aid videos module.***

Extensions:

In extension we explain the alternative scenario of use case

Extensions:

In extension we explain the alternative scenarios of use case

Alternative Flow 1: location information/GPS is off

- User cannot see location info if GPS services are off.
- Users needs to turn on the on the GPS.

Alternative Flow 2: User does not permit to use location services

- If user does not give permission to use access device location, then real time location cannot be show to the user.
- User must give permissions to use different services.

Alternative Flow 3: Data loading error occur

- If error occur data loading, then prompt message “check your internet connection”.

5.4 Sequence Diagrams

5.4.1 User Sign-Up

The below diagram defines the sequence of actions that happens when a end User tries to sign Up into the system.

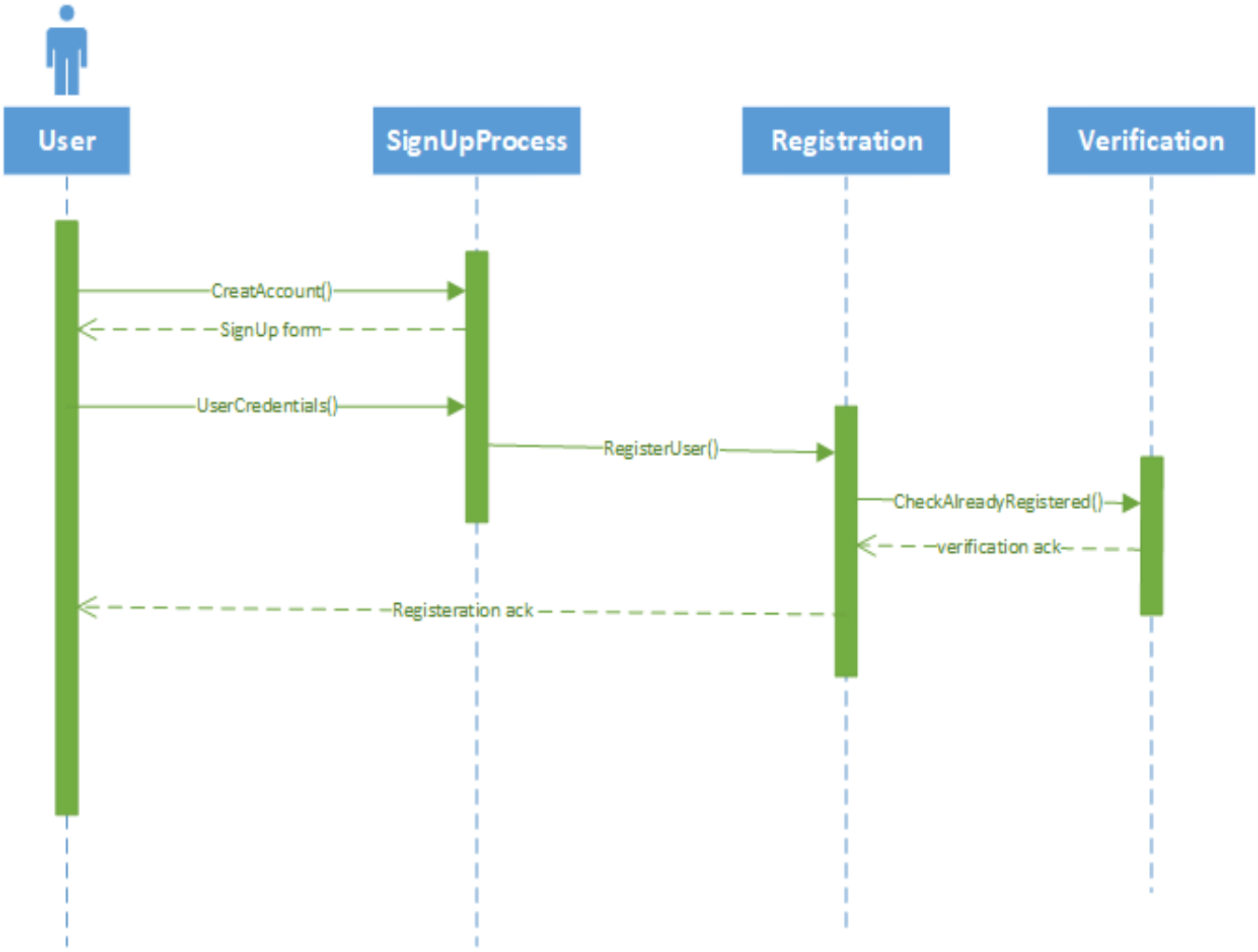

Figure 5 Sequence Diagram Sign-Up

5.4.2 Driver Sign-Up

The below diagram defines the sequence of actions that happens when a Driver has to sign Up to application.

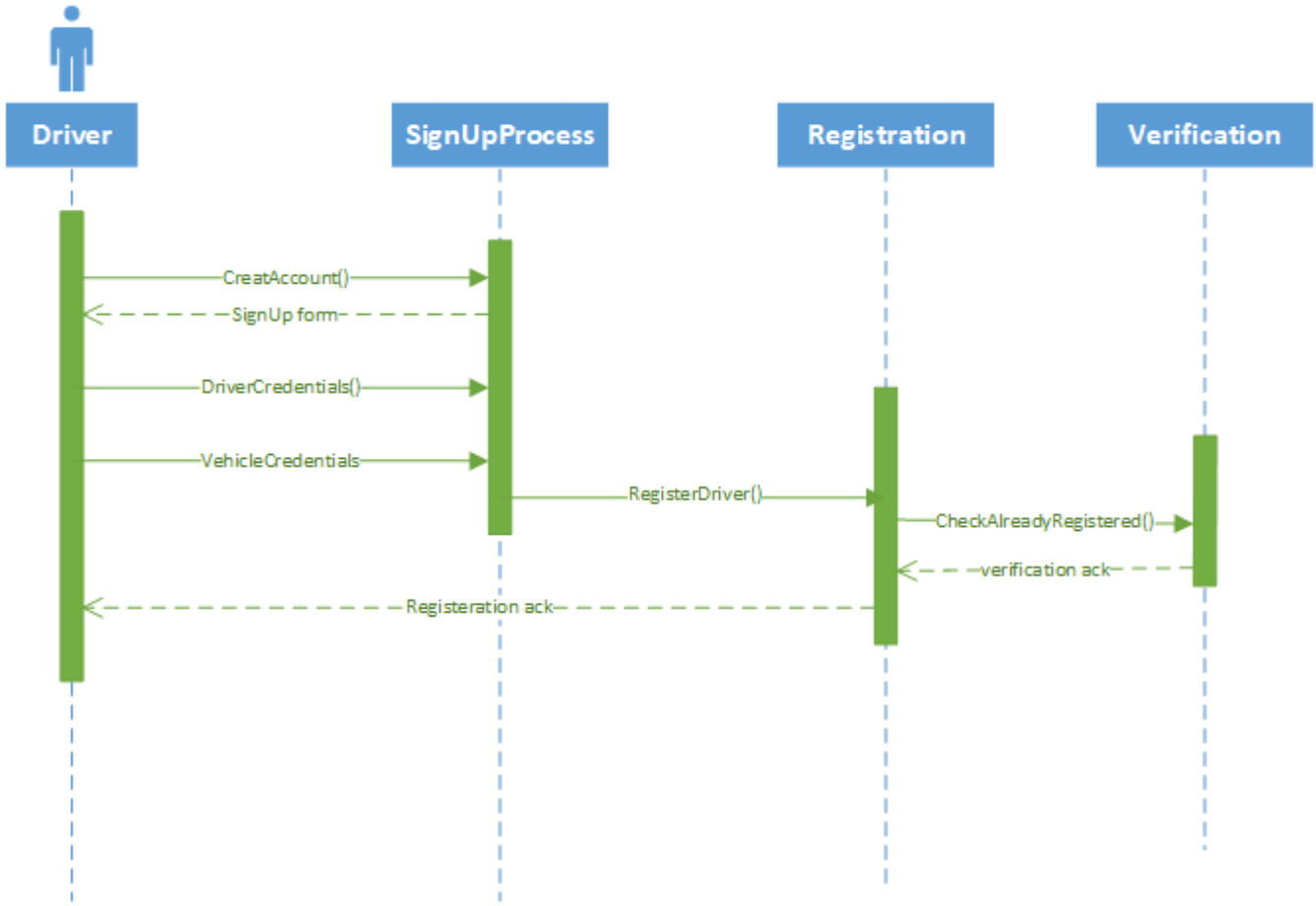

Figure 6 Sequence diagram Driver Sign-Up

5.4.3 User driver Log-In

The below diagram defines the sequence of actions that happens when a End User/Driver has to Login to the application

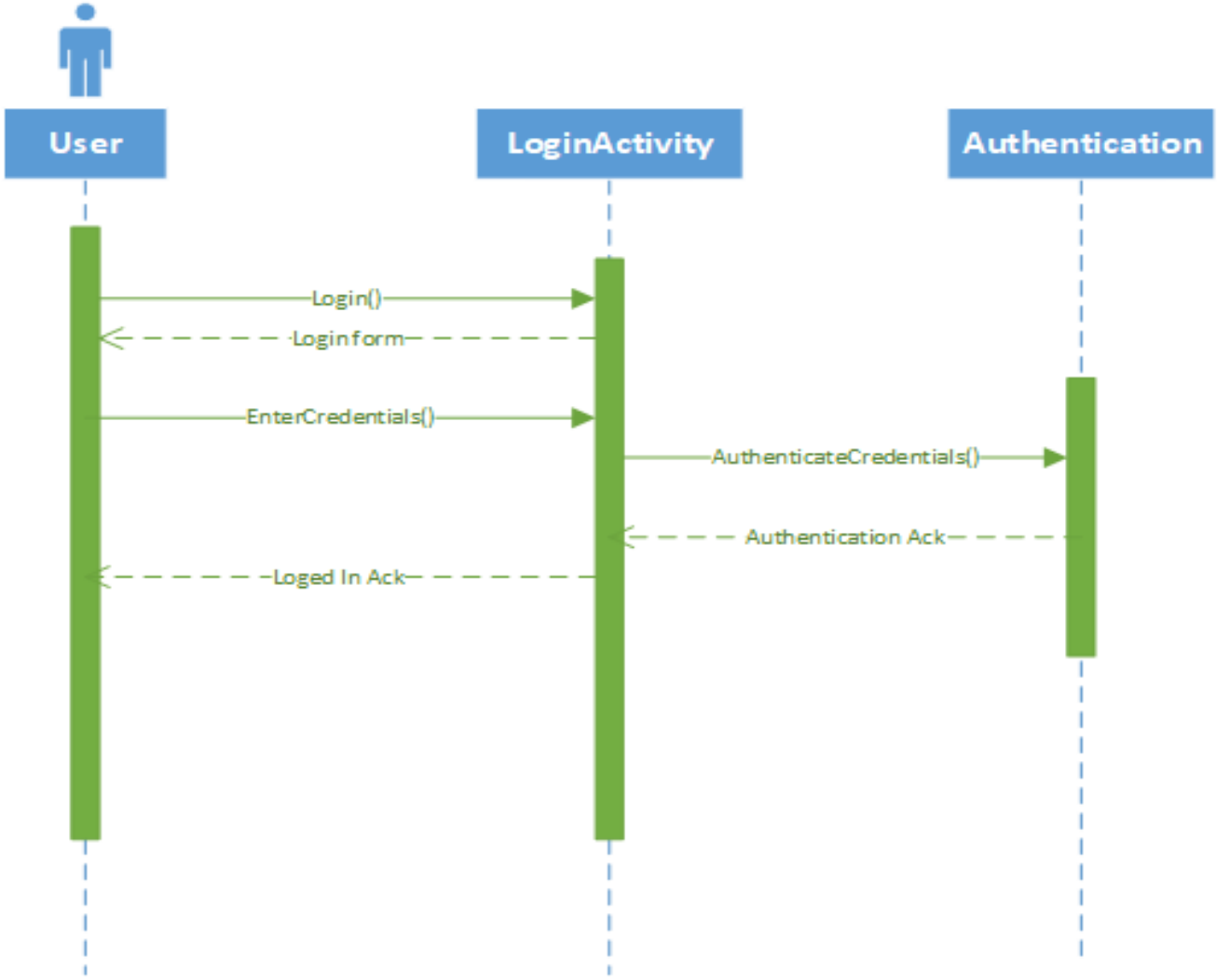

Figure 7 Sequence diagram Driver Login

5.4.4 Ambulance Booking

The below diagram defines the sequence of actions that happens when an End User tries to book the ambulance

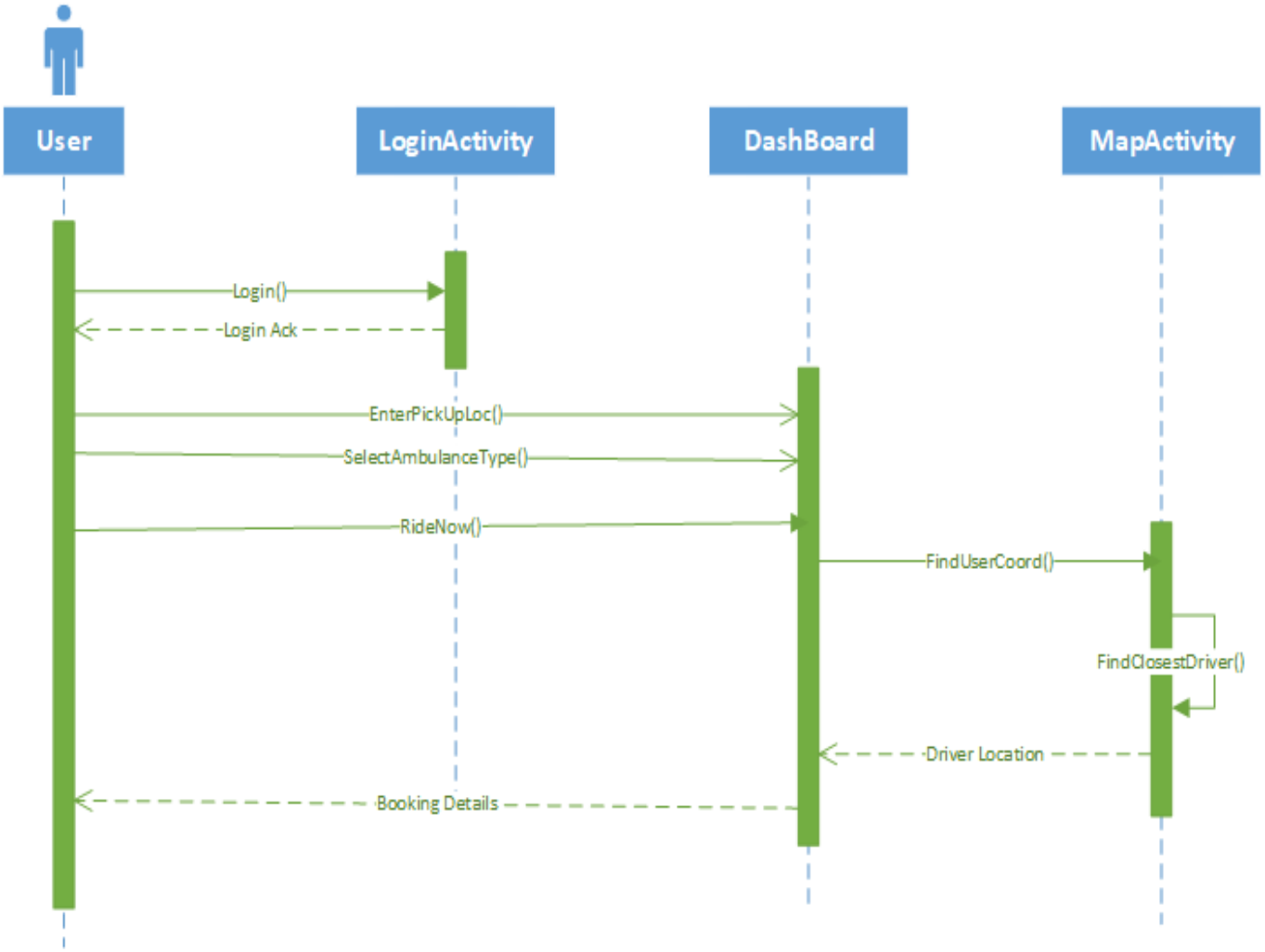

Figure 8 Sequence diagram Ambulance Booking

5.4.5 Driver Accept/Reject Request

The below diagram defines the sequence of actions that happens when a Driver receives a booking request from user

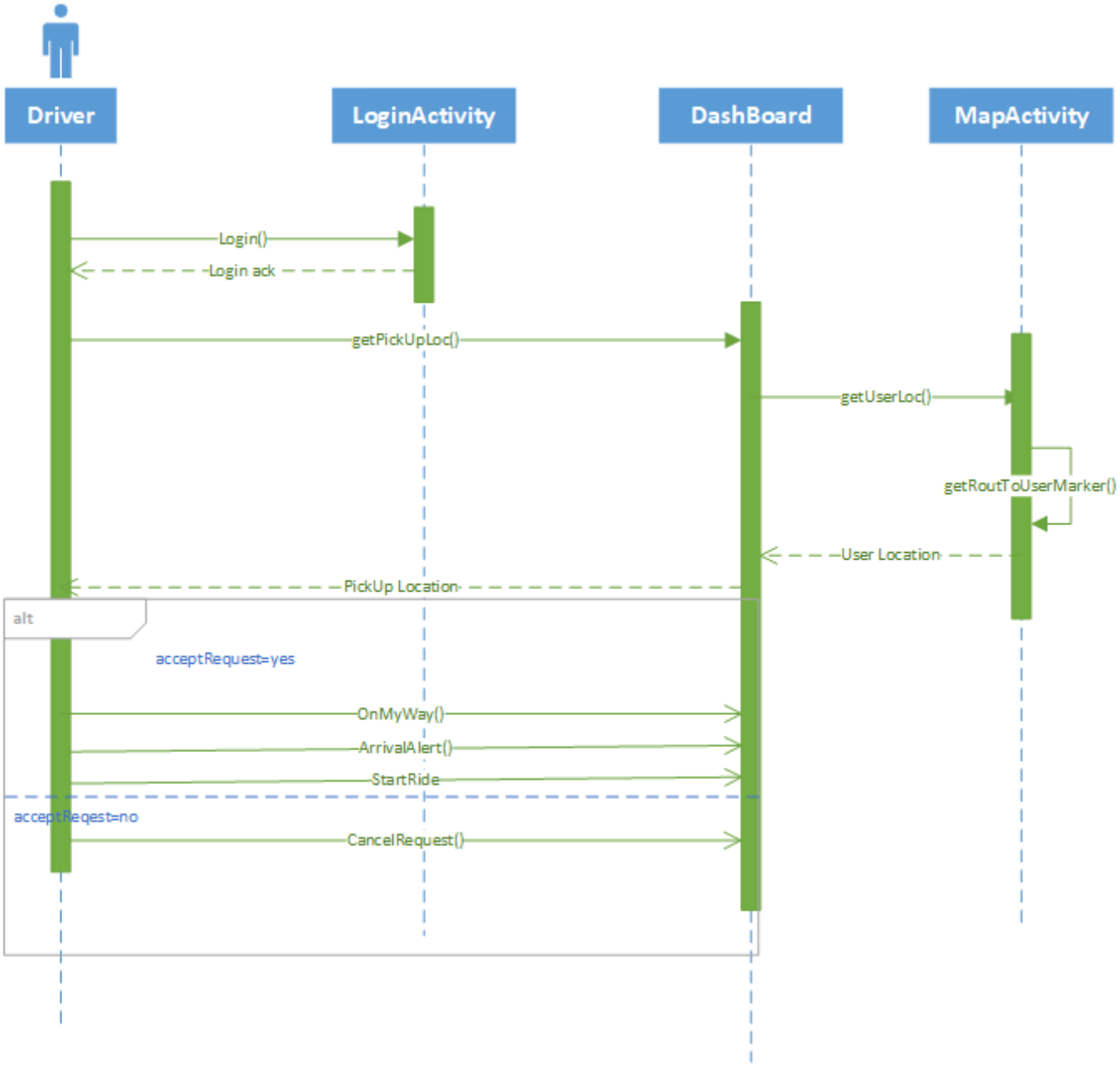

Figure 9 Sequence Diagram Driver accepts/rejects request

5.4.6 View Feedback

The below diagram defines the sequence of actions that happens when an End User/Driver views the feedback of the previous bookings

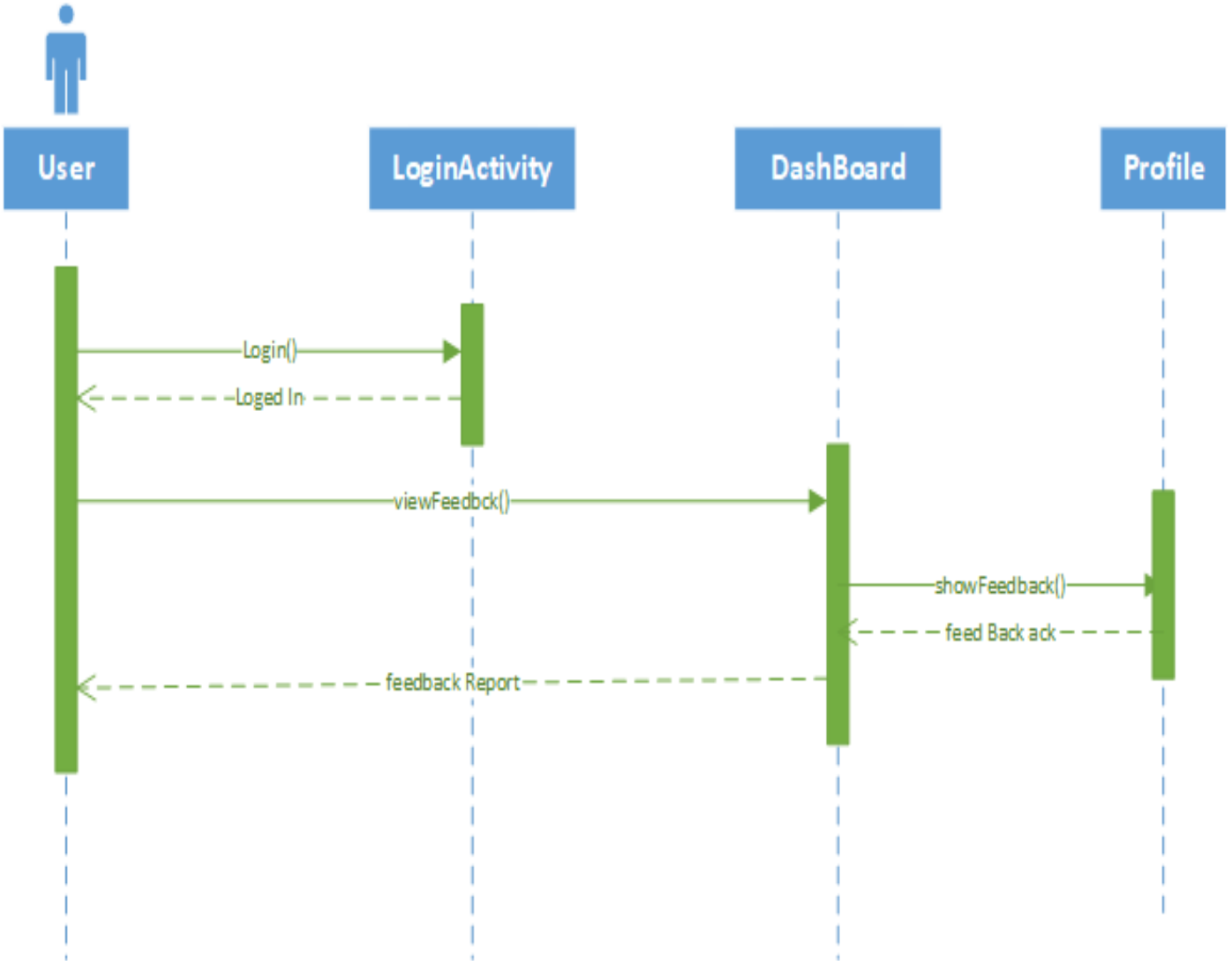

Figure 10 Sequence Diagram View Feedback

5.4.7 View History

Below is the diagram that defines the sequence of actions that happens when an End User/Driver view the History of the previous bookings

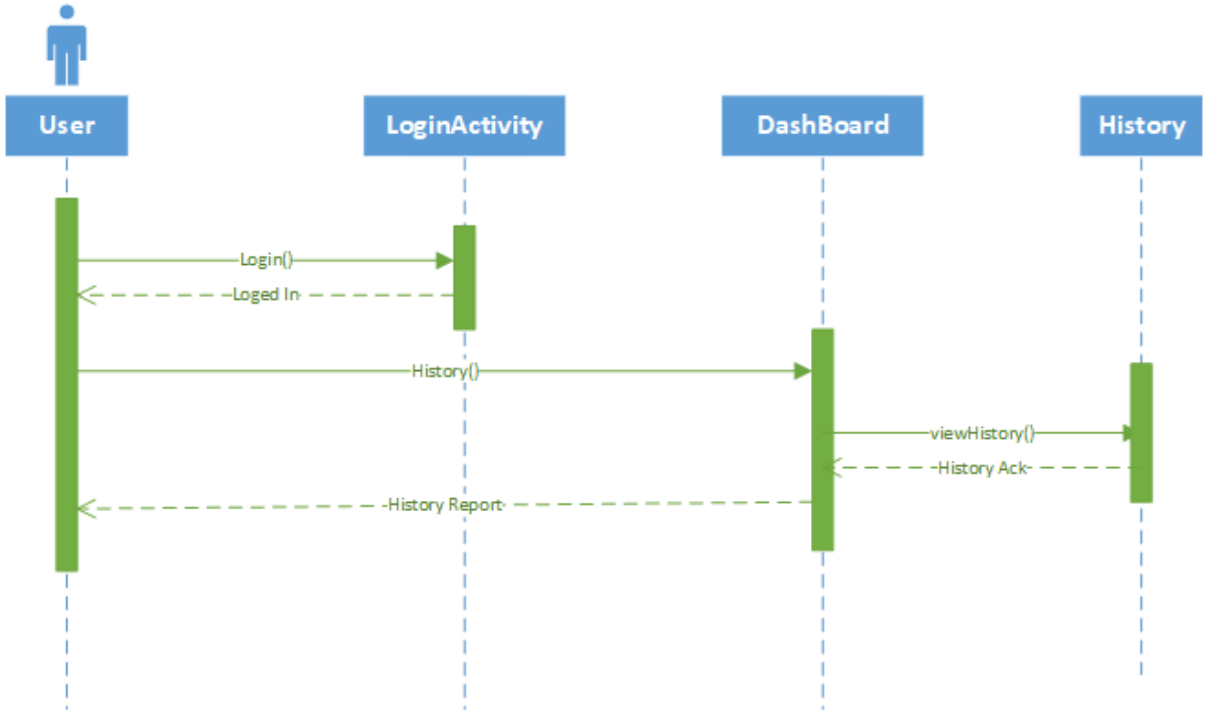

Figure 11 Sequence diagram view History

5.5 Activity Diagrams

5.5.1 User Sign Up:

Below diagram defines the stream of activities that an End User needs to execute while performing the Sign Up process

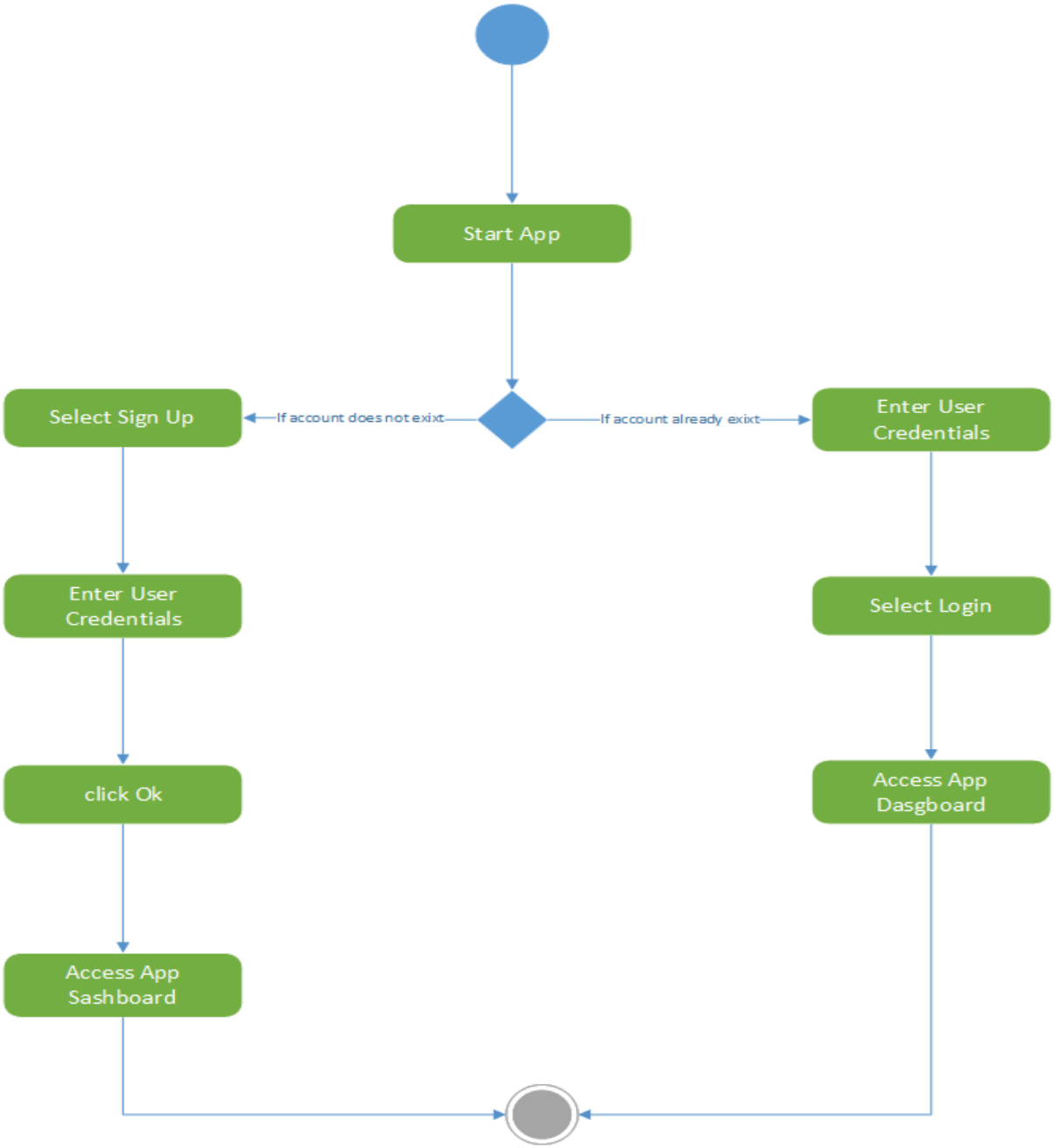

Figure 12 Activity Diagram: User Sign-Up

5.5.2 Driver Sign Up:

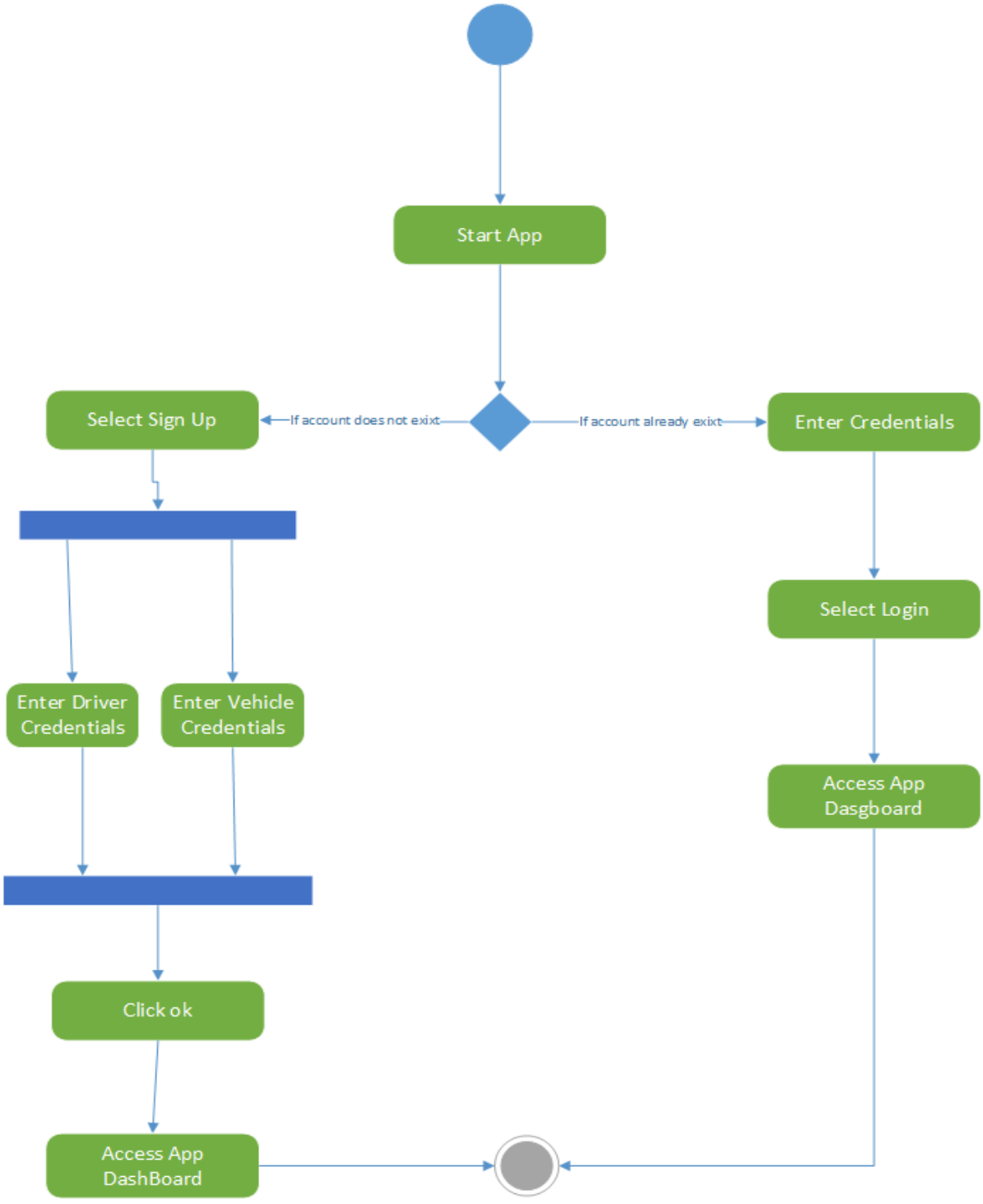

Figure 13 Activity Diagram: Driver Sign-Up

5.5.3 Booking Ambulance

Below diagram defines the stream of activities that an End User needs to execute while booking an Ambulance

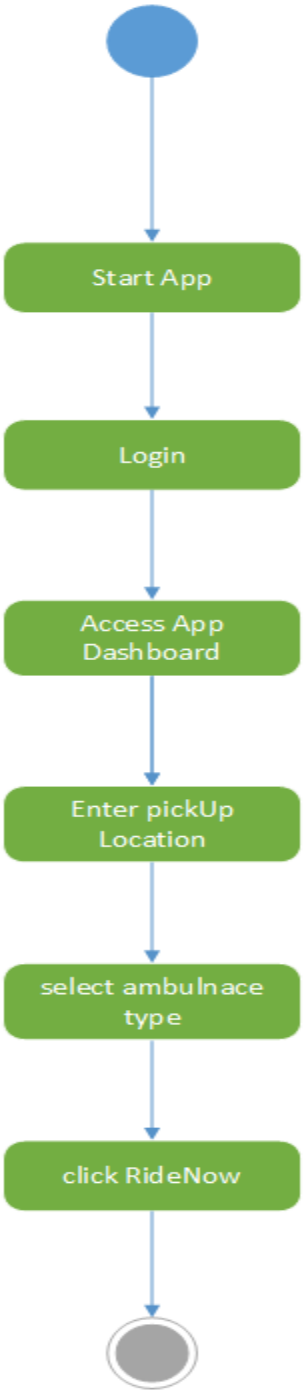

Figure 14 Activity Diagram: Booking an Ambulance

5.5.4 Driver Accept/Reject Request

Below diagram defines the stream of activities that a Driver can execute after he receives a pickup request from user.

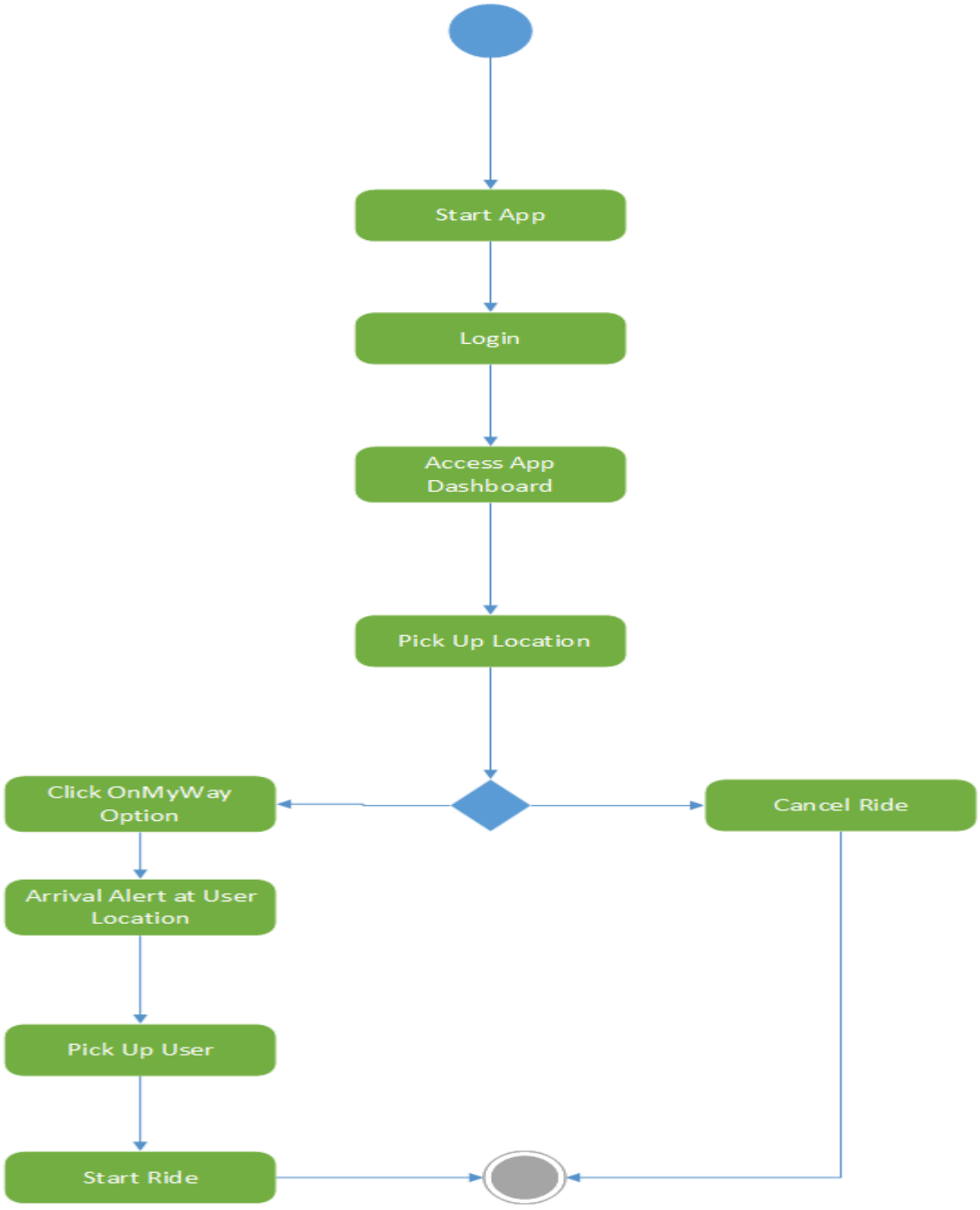

Figure 15 Activity Diagram: Driver Accept/reject request.

5.5.5 View Feed Back and History

Below diagram defines the stream of activities that an End User/Driver needs to execute to view feedback and history of previous rides

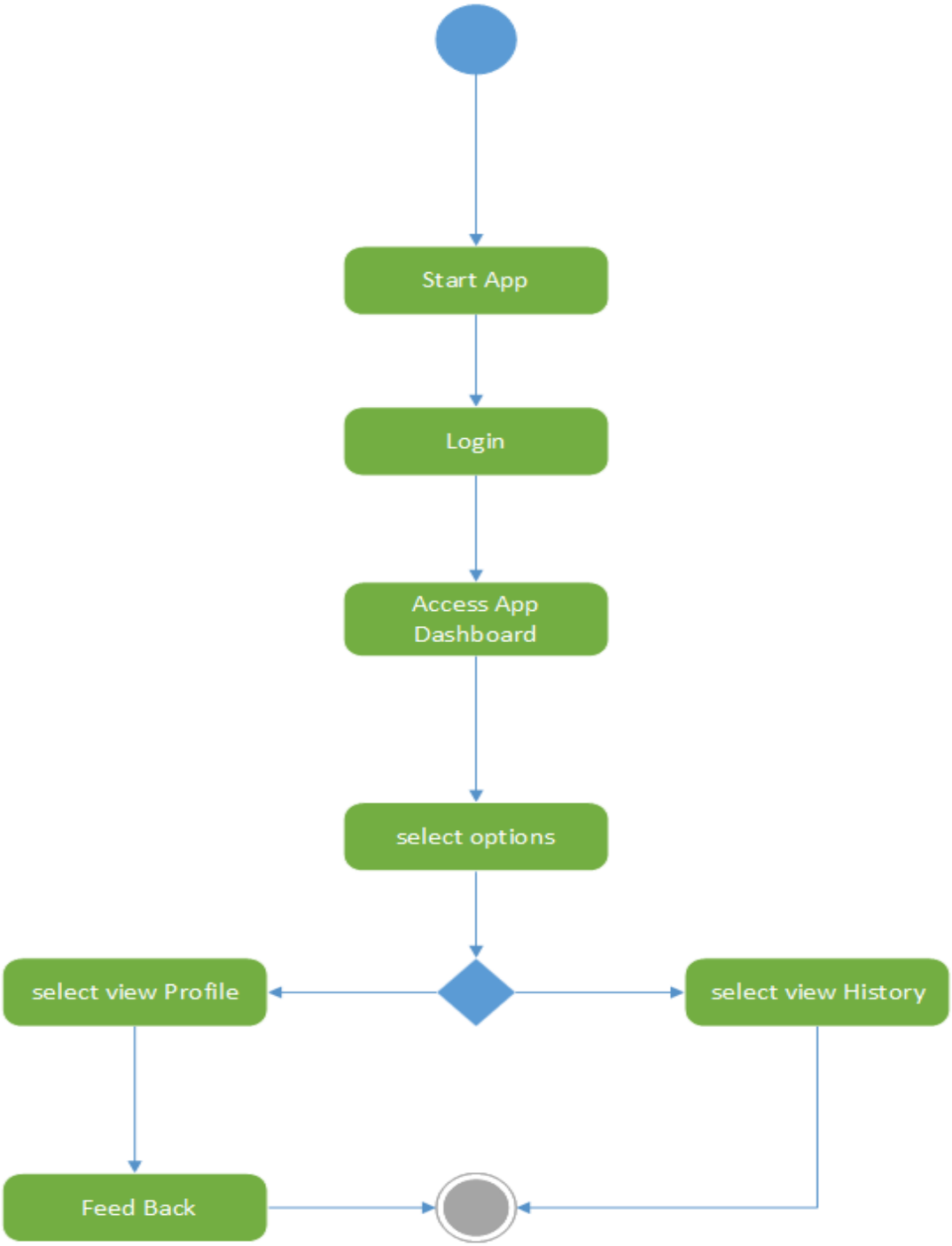

Figure 16 Activity Diagram: View Feedback and History.

5.5.6 Overall System Activities

Below diagram shows the overall system activities.

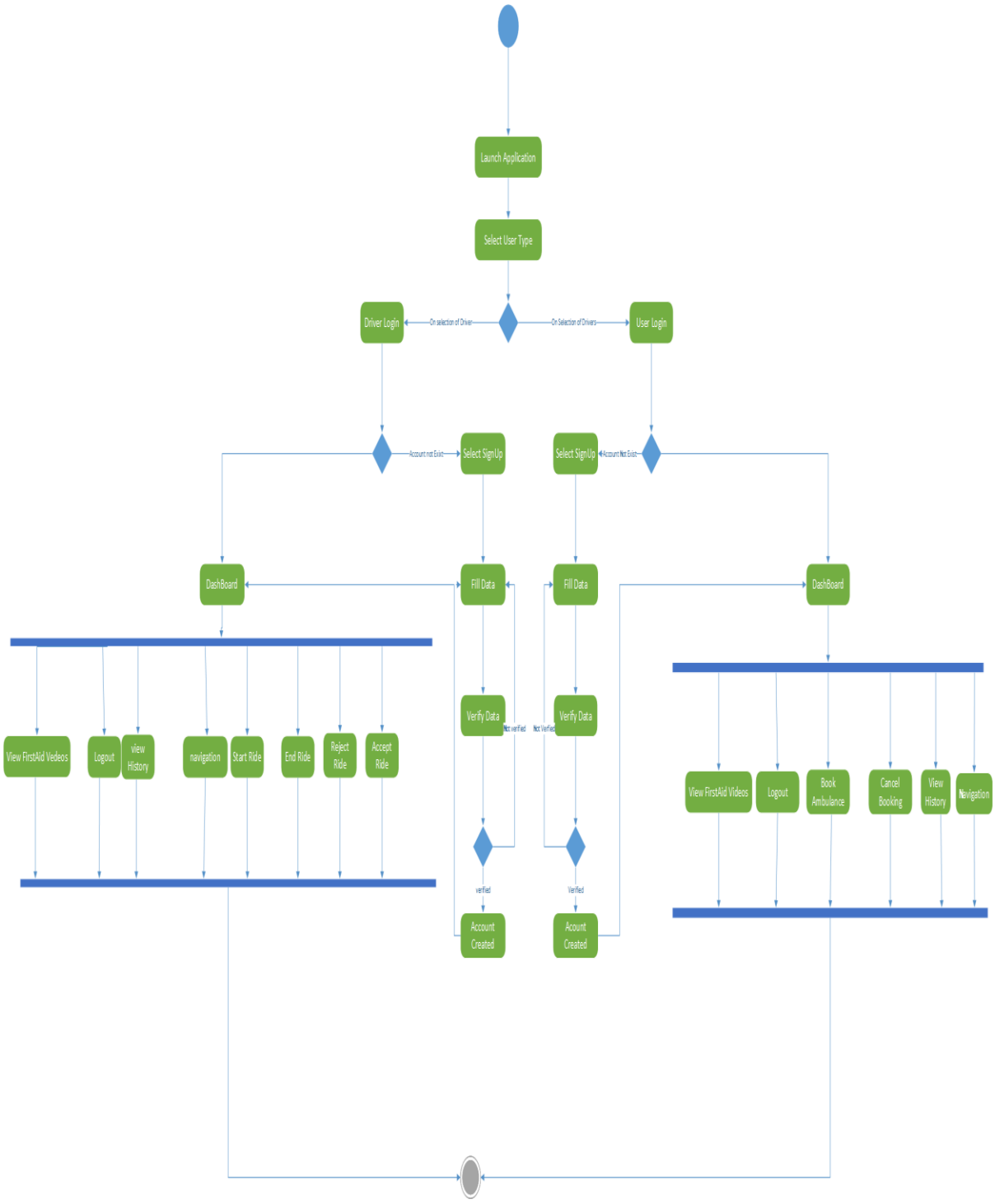

Figure 17 Activity Diagram: System over-all activities

5.6 Design Rationale

The layered architecture design is a strong broadly useful example, making it a decent beginning stage for most applications, especially when you don't know what architecture design is most appropriate for your application. In any case, there are a few interesting points from a architecture design viewpoint while picking the pattern.

The main thing to keep an eye out for is what is known as the architecture sinkhole anti-pattern. This anti-pattern depicts the circumstance where solicitations course through different layers of the design as straightforward go through preparing with practically zero rationale performed inside each layer. For instance, accept the introduction layer reacts to a solicitation from the client to recover client information. The introduction layer passes the solicitation to the business layer, which essentially passes the solicitation to the constancy layer, which at that point makes a basic SQL call to the database layer to recover the client information. The information is then passed right back up the stack with no extra handling or rationale to total, compute, or change the information.

Each layered architecture will have probably a few situations that fall into the design sinkhole hostile to design. The key, be that as it may, is to examine the level of solicitations that fall into this classification. The 80-20 standard is normally a decent practice to follow to decide if you are encountering the design sinkhole against design. It is commonplace to have around 20 percent of the solicitations as straightforward go through preparing and 80 percent of the solicitations having some business rationale related with the solicitation. In any case, in the event that you find that this proportion is switched and a dominant part of your solicitations are basic go through handling, you should consider making a portion of the design layers open, remembering that it will be progressively hard to control change because of the absence of layer confinement.

Another thought with the layered design is that it will in general loan itself toward solid applications, regardless of whether you split the introduction layer and business layers into isolated deployable units. While this may not be a worry for certain applications, it represents some expected issues as far as sending, general strength and dependability, execution, and versatility.

5.7 Component Design

We gave an Object-Oriented description in section 5.7 and summarized each object member function in all the objects created.

5.7.1 CreatAcount ()

Begin

IF User is an End User

Enter the User Credentials

Else

Enter Driver Credentials and Vehicle Credentials

End

5.7.2 UserCredentials ()

Begin

Enter First name

Enter Last name

Enter Email

Enter Password

Enter Phone Number

End

5.7.3 DriverCredentials ()

Begin

Enter First Name

Enter Last Name

Enter Email

Enter password

Enter Phone Number

End

5.7.4 VehicleCredentials ()

Begin

Enter Driver License Details

Enter Vehicle Registration Details

End

5.7.5 Login Activity

5.7.5.1 Login ()

Begin

Enter Credentials

Authenticate credentials

IF Authenticate=yes

Access Dashboard

Else

Access Denied

End

5.7.5.2 EnterCredentilals ()

Begin

Enter Email

Enter Phone Number

Enter Password

End

5.7.6 Profile

5.7.6.1 getInfo ()

Begin

Get User Credentials from Sign Up Process

Store User Credentials

End

5.7.6.2 UpdateInfo ()

Begin

Get Changed Information

Update Previous Information

End

5.7.6.3 ShowFeedBack ()

Begin

Take User Feed Back

Take Driver Feed Back

Store Feed Back

Show Feed Back to the User and Driver

End

5.7.6.4 ViewUserProfile ()

Begin

IF UserID=End User's Id

Show User's Stored Information

Else

Show Driver's Stored Information

End

5.7.7 Map Activity

5.7.7.1getUserLoc ()

Begin

IF GPS is on

Seek Auto Location of User

Else

Enter the Location

End

5.7.7.2 getRoutToMarker ()

Begin

Take Coordinates from getUserLoc ()

Find Coordinates on Map using FindUserCoordinates ()

End

5.7.7.3 FindCloseDriver ()

Begin

Driver Turns on The GPS

Find Coordinates of All The Drivers within a Specified Radius

Find Driver with Min Distance

Send Location Notification to User

End

5.7.7.4 FindUserCoordinates ()

Begin

User Enter the Location

Find Coordinates on the Map

End

5.7.8 Registration

5.7.8.1 RegisterUser ()

Begin

Get credentials from UserCredentials ()

Store them in Database

End

5.7.8.2 RegisterDriver ()

Begin

Get Driver Credentials from DriverCredentials()

Get Vehicle Details from VehicleCredentials()

Store them in DataBase

End

5.7.9 Authentication

5.7.9.1 AuthenticateCredenmtials ()

Begin

Get Credentials from EnterCredentials ()

Compare them with DataBase

IF CredentialsMatch=Yes

Access DashBoard

Else

Access Denied

End

5.7.10 Verification

5.7.10.1 CheckAlreadyRegisterdUser ()

Begin

Get User Credentials from UserCredentials ()

Get Driver Credentials from DriverCredentials ()

IF Match=yes

Enter Credentials again

Else

Store Credentials

End

5.7.11 History

5.7.11.1 ViewHistory ()

Begin

Store Booking Details In Data Base

End

5.7.12 Dashboard:

5.7.12.1 FetchHistory ()

Begin

Retrieve Booking Details from Data Base

End

5.7.12.2 viewFeedBack ()

Begin

Retrieve Feed Back from Data Base

End

5.7.12.3 CancelRequest ()

Begin

Cancel Pick Up Request

End

5.7.12.4 AmbulanceType ()

Begin

Enter the different types of the Ambulance

Store them in Data Base

Retrieve Them From Data Base

Choose type from Available types

End

5.7.12.5 RideNow ()

Begin

Select Ride Now

Send Notification to Driver

End

Chapter 6

6 System Implementation

6.1 Technology Used

6.1.1 Programming Language Used

Firebase database has been sed for handling all the data storing, retrieval and fetching that is used to operate the application. The android application for the project was written using Java and XML.

6.1.2 Development Tools

Application is developed using Android Studio development Toolkit. Database access is provided by web interface of the cloud computing services of Firebase.

6.1.3 Database

The systems Database shall be designed and maintained using Firebase.

6.1.4 Operating System

Android application developed shall be able to run all devices operating on Android 5.0 i.e. KitKat or later versions.

6.2 Complete System Implementation

The system comprises of two main components. An android application in which separate modules are designed for driver and user i.e. passenger. The major modules of The Android Application will be discussed in detail in the succeeding sections.

6.2.1 Choose Driver/User

Given that the application shall be used by Driver or user. This module provides the interface to choose between user and driver, additionally the system then provides functionality based on the selected type of user.

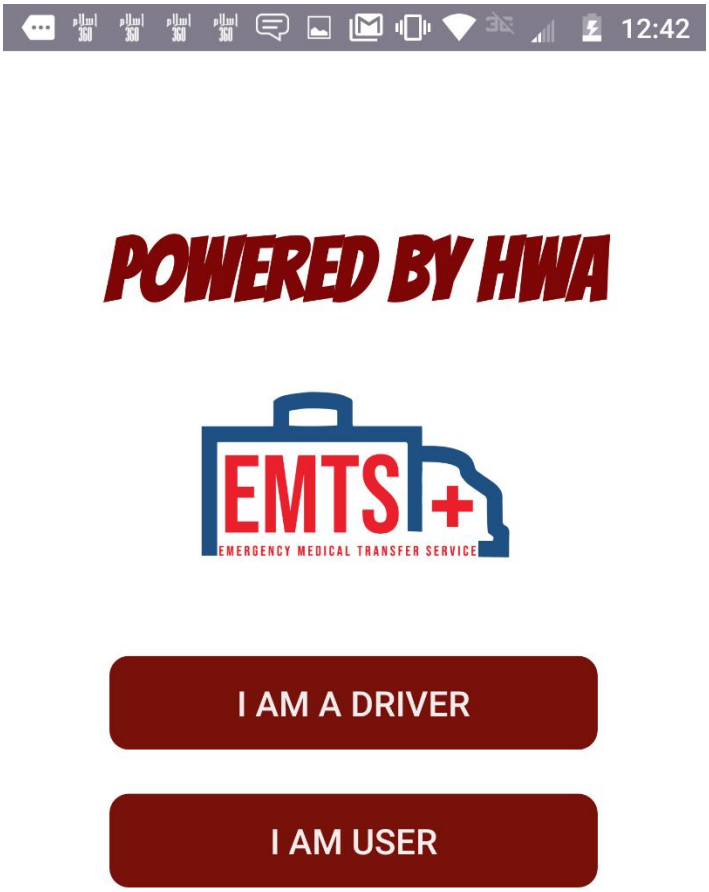

Figure 19 Choose Driver/User screen

6.2.2 Login Module

This is the main module, which greets the user following successful login. This is used to access all the different functionality of the application and can be considered as a main menu. It can be used to Lodge complaints, View Complaints lodged by the user and to logout.

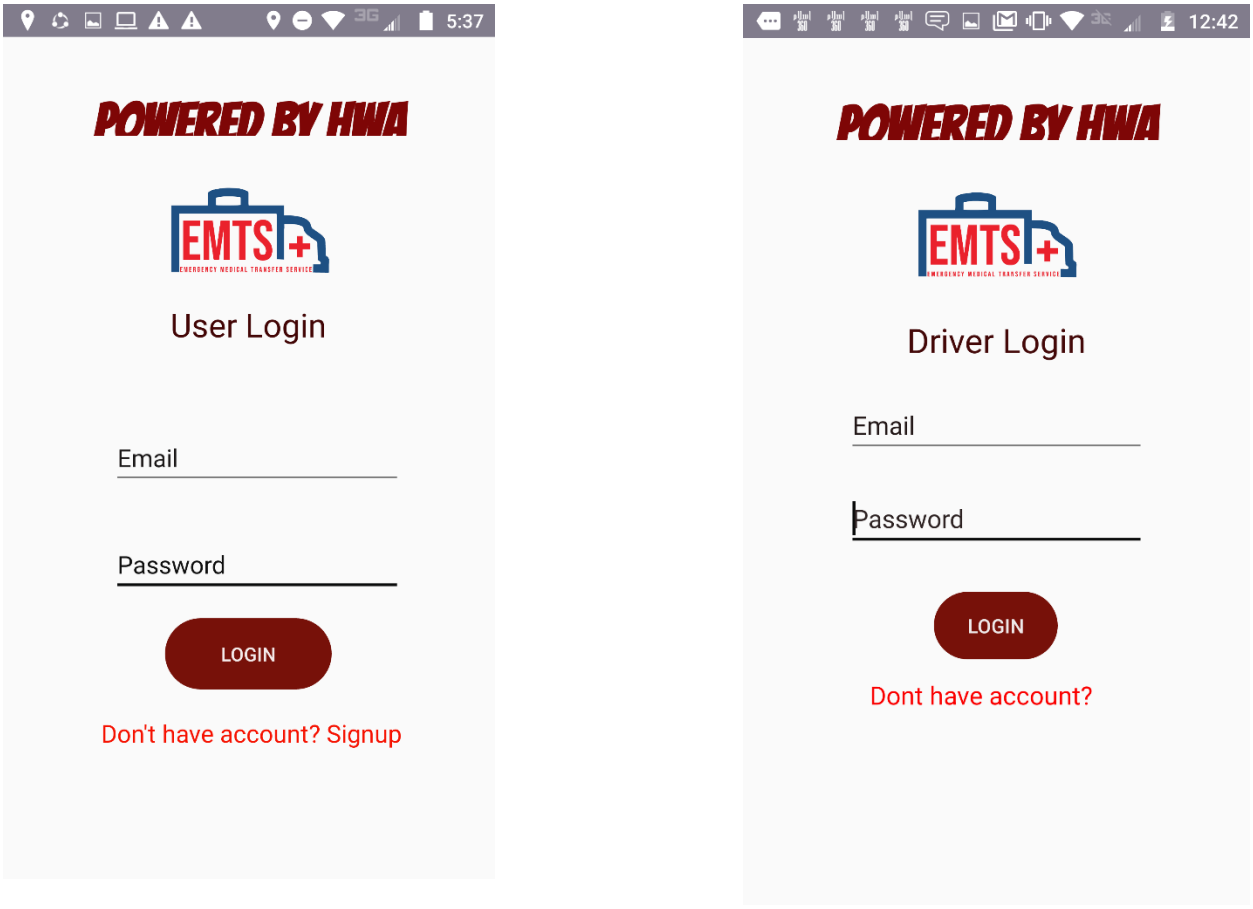

Figure 20 Login Module

6.2.3 User/Driver Dashboard

This is the module which comprises all the functionality concerning to lodging of a complaint, including acquiring GPS location data and permitting adding a picture to the complaint. Location data can also be entered manually. All these particulars are stored in the database, and a unique tracking Id for the complaint is deliverd to the user.

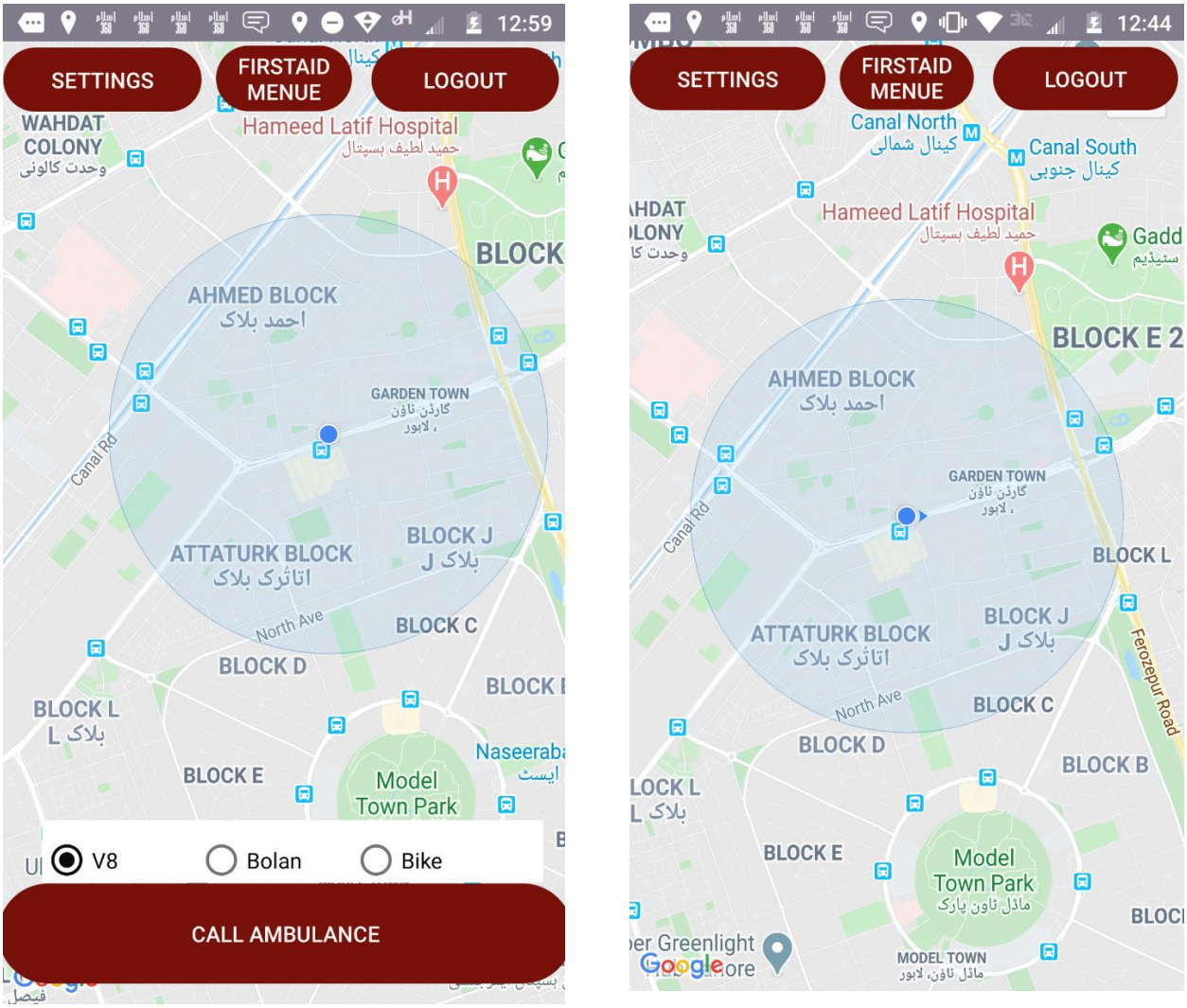

Figure 21 User/Driver Dashboard

6.2.4 User/Driver View Profile

This module allows logged in users to view the complaints that they have lodged and view the development that has taken place for those specific complaints. It does so by seeing the tracking Id's connected with the account currently logged in to the application, then shows these. Upon selecting one, the details of that complaint are showed.

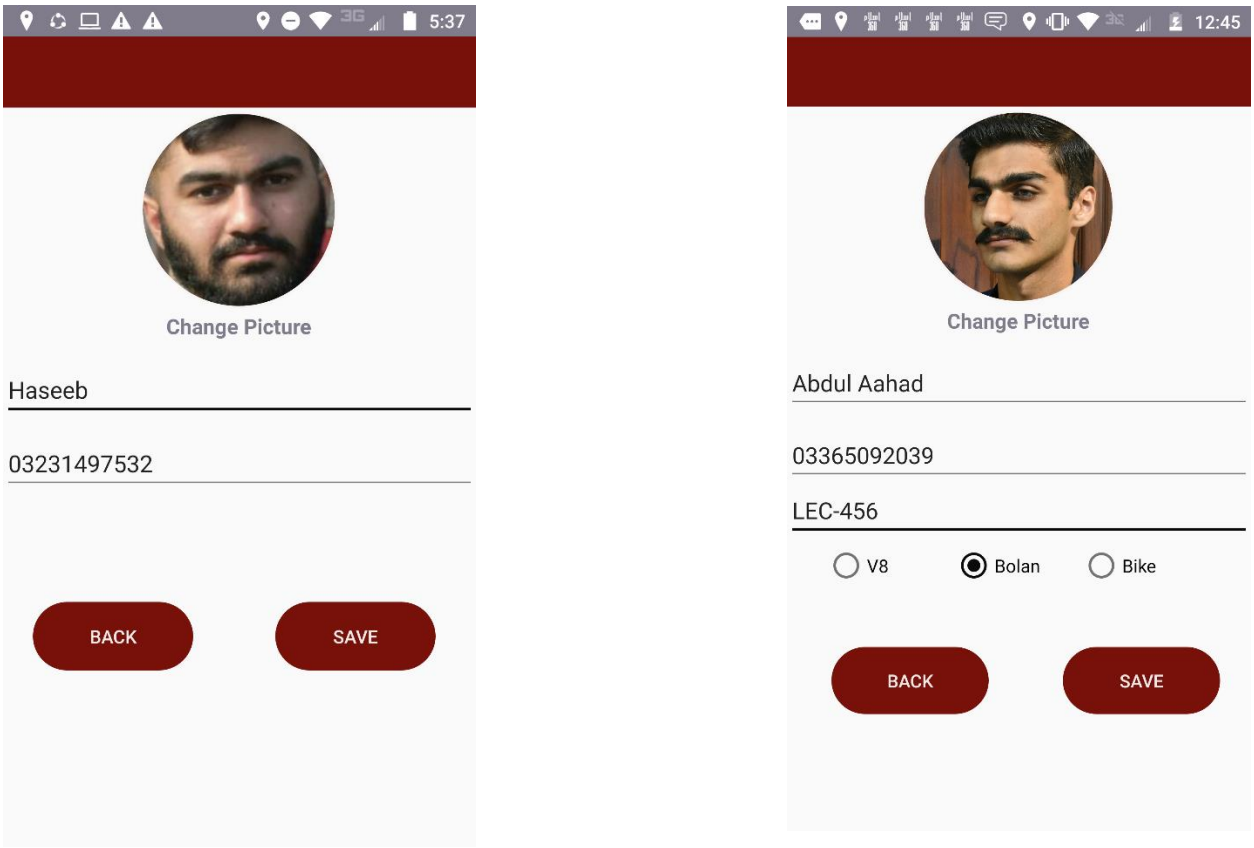

Figure 22 User/driver view profile

6.2.5 User Booking Ambulance

User can Book ambulance by clicking on CALL AMBULANCE on dashboard. Once user request for ambulance the system shall check all near ambulances operating in a specific radius. The system shall a lot the nearest ambulance to the user. The figure shows details of ambulance allotted to user, driver contact

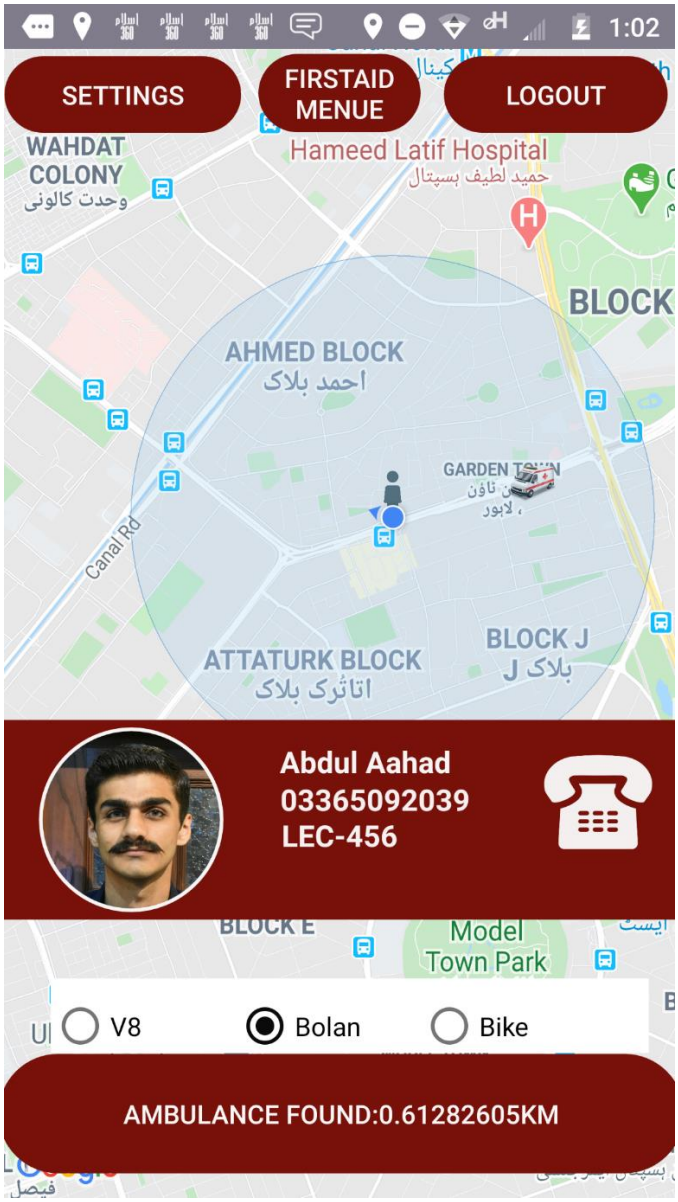

Figure 23 User booking Ambulance

6.2.6 Driver receiving request

As shown Haseeb is acting as user while he books ambulance, user can click on the phone icon to contact the driver.

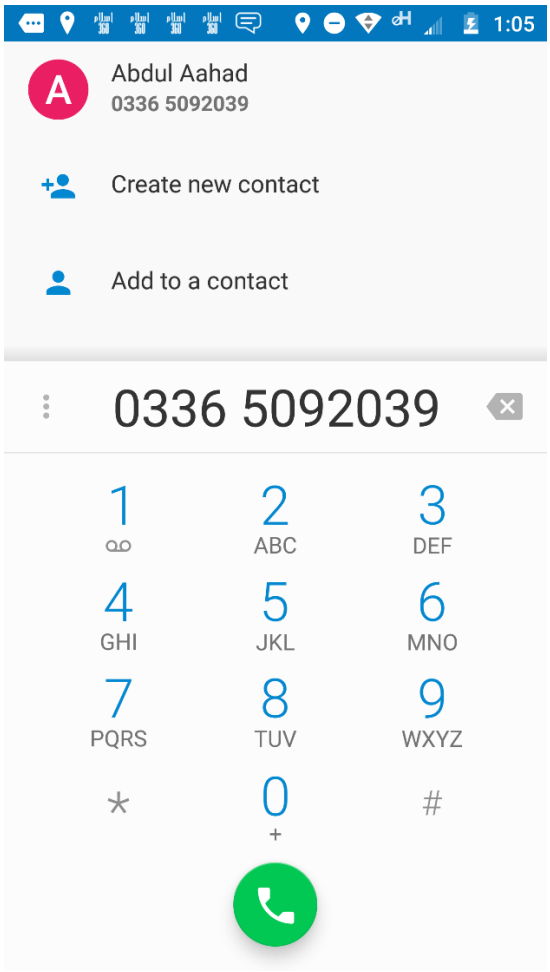

Figure 24 driver receiving request

6.2.7 First Aid videos Module/Video player:

Meanwhile during the waiting time for the ambulance, the user can get guidance regarding any specific incident to treat the patient on first-aid basis.

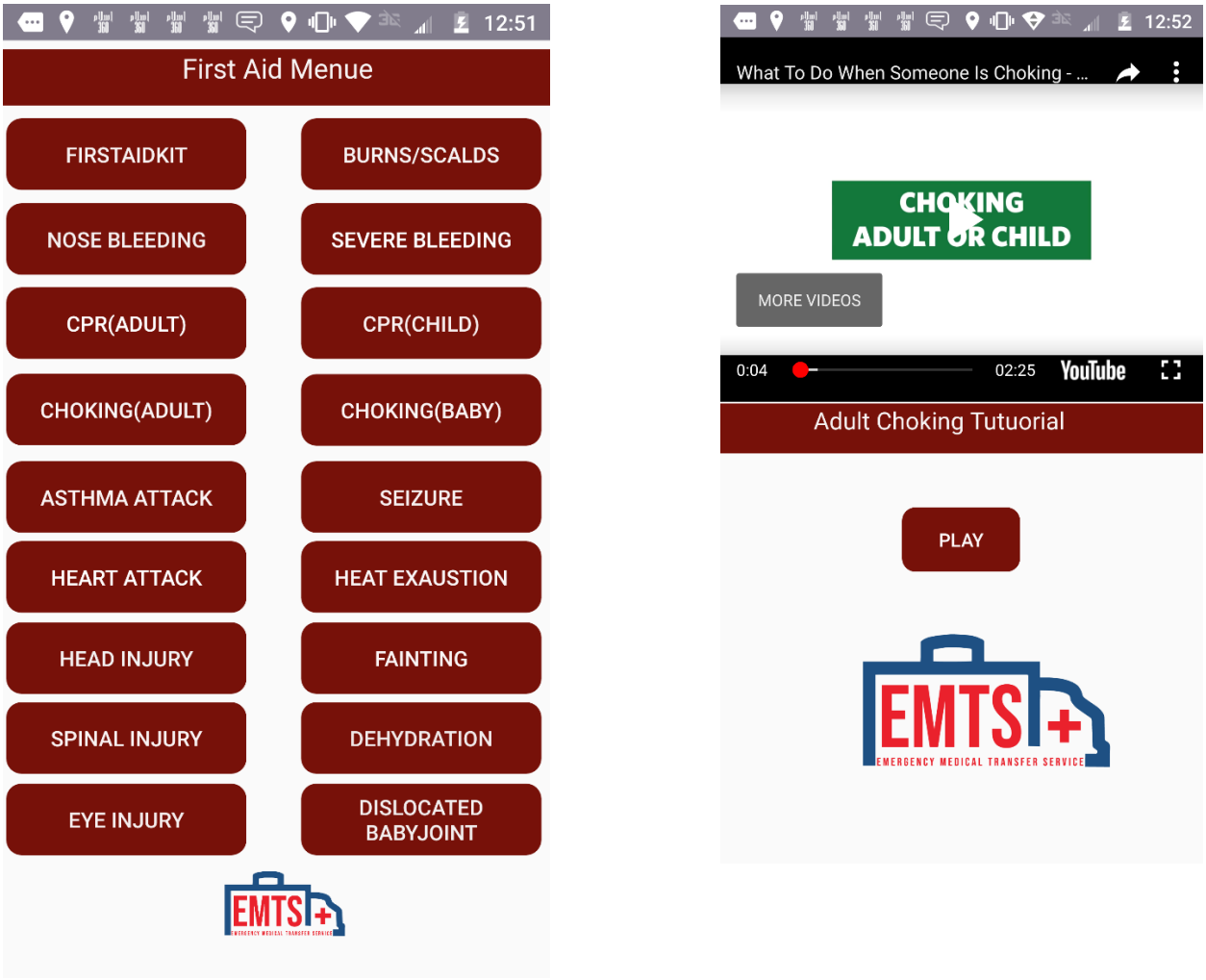

Figure 25 First-Aid videos Module

Chapter 7

7 System Implementation

7.1 Overview

Testing of software projects include different levels of testing to ensure that the software which is being developed is error and fault free. The different levels at which testing was performed is argued here.

7.1 Unit Testing

It includes the testing of each module at completion.

7.1.1 Login Feature Testing

Test Case Name:	**System Login Testing**	
Test Case ID:	01	
Description of Case	This module shall enable user to login to the system by providing his credentials. As per the sequence of authorization the credentials are checked with the database, noted that access shall be granted only to verified credentials.	
Testing technique used:	Black Box Testing	
Preconditions:	System operating normally and connectivity of system and database is already established.	
Input values:	Username: String Password/PIN: String	

Valid Inputs:	Registered Users/legal Users credentials Registered password/legal password	
Steps	1. Enter username/email 2. Enter PIN/password 3. Click SIGN IN	
Expected Output	After successful verification of the user credentials from the database, the user shall be directed to the dashboard.	
Actual Output	User logged in successfully.	
Status	POSITIVE/PASS	

Table 17 System Login Testing

7.1.2 Sign up feature Testing

Test Case Name:	**Sign Up Module testing**
Test Case ID:	02
Description:	This module shall enable user to register to the system by providing his credentials. As per the sequence of registration the

	credentials are stored within the database, noted that access shall be granted on the basis of these credentials.	
Testing technique used:	Black Box Testing	
Preconditions:	System shall be operating normally and connectivity of system and database is already established.	
Input values:	First Name Last Name Email Password	
Valid Inputs:	First Name; Type: Alphanumeric Last Name Type: Alphanumeric Email id: Format: abc@xyz.com Password: Type: Alphanumeric	
Steps	1. Enter First Name 2. Enter Last Name 3. Enter Email 4. Enter Password 5. Tap SIGN UP button	
Expected Output	Credentials provided by user shall be stored at the database.	
Actual Output	Credentials provided by user are stored in database.	

Status	PASS/POSITIVE

Table 18 Sign up Feature Testing

7.1.3 Ambulance Booking

Test Case Name:	**Ambulance Booking**	
Test Case ID:	03	
Description:	This feature allow user to book ambulance for ride.	
Testing technique used:	Black Box Testing	
Preconditions:	System is operating and database connectivity is established.	
Input values:	Enter User Pickup Location Select Ambulance Type Select Destination Click Confirm	

Valid Inputs:	Pickup Location in terms of Longitudinal, Latitude coordinates Drop-off Location in terms of Longitudinal, Latitude coordinates Ambulance type: alphabets	
Steps	1 Enter User Pickup Location 2 Select Ambulance Type 3 Select Destination 4 Click Confirm	
Expected Output	User is assigned an Ambulance	
Actual Output	User is assigned an Ambulance	
Status	PASS	

Table 19 Ambulance Booking

7.1.4 Driver Accept/reject request

Test Case Name:	**Social Media Sharing Feature Testing**

Test Case ID:	6	
Description:	This feature allows the user to share a Problem on social media. This test case is used to enquire the sharing of a Problem on social media (E.g. Facebook, Twitter).	
Testing technique used:	Black Box Testing	
Preconditions:	System is running and linked to database. Minimum one problem is added.	
Input values:	Problem	
Valid Inputs:	Valid Problem parameters	
Steps	1. Tap the Share Icon 2. Choose the Social media platform 3. Write Post 4. Tap Share	
Expected Output	Problem is shared on Social Media.	
Actual Output	Problem is shared on Social Media.	

Status	PASS

Table 20 Driver accept/reject Table

Chapter 8

8 Conclusion and Future Work

8.1 Conclusion

Our goal was to develop a system to find out innovative and creative solution for patients and emergency situations that affect us in different ways in our daily life. A system needs to be developed that will allow common people to call ambulance from a remote area using cell phones by revealing their exact location to the drivers of ambulance service.

We accomplished our objectives, successfully developing an Android Application that lets users to book ambulance from remote area by providing his pickup location. Similarly, the driver can accept/reject booking requests of the customers, additionally it provides navigation to the location, this way we automated the whole emergency medical and transfer services through a mobile application.

Due to constraints of time and team size, the scope of the project was kept small. Initially we will deploy the system in one hospital, but its scope can be enhanced with the passage of time.

We firmly believe that our project can genuinely bring about a significant change in the lives of people.

8.2 Future work

Due to certain intrinsic limits in terms of project development time and team size, a lot of things had to be omitted from the scope of this project. However, this leaves room for a horde of enhancements, expansions and functionality add-on’s.

First of all, at the moment the Project only caters for any specific hospital or welfare organization e.g. Edhi, Recue1122 therefore the user base for the system will be extremely limited. In the future however, functionality could be expanded to include all major cities and hospitals of Pakistan.

Currently the application only handles the booking services of ambulances. Number of features can be incorporated in the application. Diet Plans can be included for different types of patients. Doctors appointment system can be integrated in the application, additionally First-Aid module can be designed that will guide the users to give the required treatment to the patient during the

waiting time of the ambulance arrival. Currently, the application only works on Android devices, further limiting its potential user base. In the future, an application can be developed for iOS, Windows Mobile, Ubuntu Mobile. This would enable smartphone users on all major platforms to take advantage of the application.

Among minor changes, the application's User Interface could be modified to be even more user friendly and the application could be improved to run faster and enhance performance on lower end devices.

Glossary

API	Application Programming Interface
App	Application
AS	Assumption
Black box Testing	Testing emphasizes on the external behaviour of the software entity
CO	Constraints
App	Application
CEO	Chief Executive Officer
DBMS	Database Management System
DEP	Dependency
FRs	Functional Requirements
GUI	Graphical User Interface
IDE	Integrated Development Environment
iOS	Mobile Operating System created and developed by Apple
MCS	Military College of Signals
NFRs	Non Functional Requirements
NUST	National University of Science and Technology
OE	Operating Environment
OS	Operating System
Parse	Cloud Server

REQ	Requirement
SQL	Structured Query Language
SR	Safety Requirements
SRS	Software Requirements Specification
UD	User Documentation
UML	Unified Modelling Language
White Box Testing	Testing emphasizes on the internal behaviour of the software entity

Table 21 Glossary

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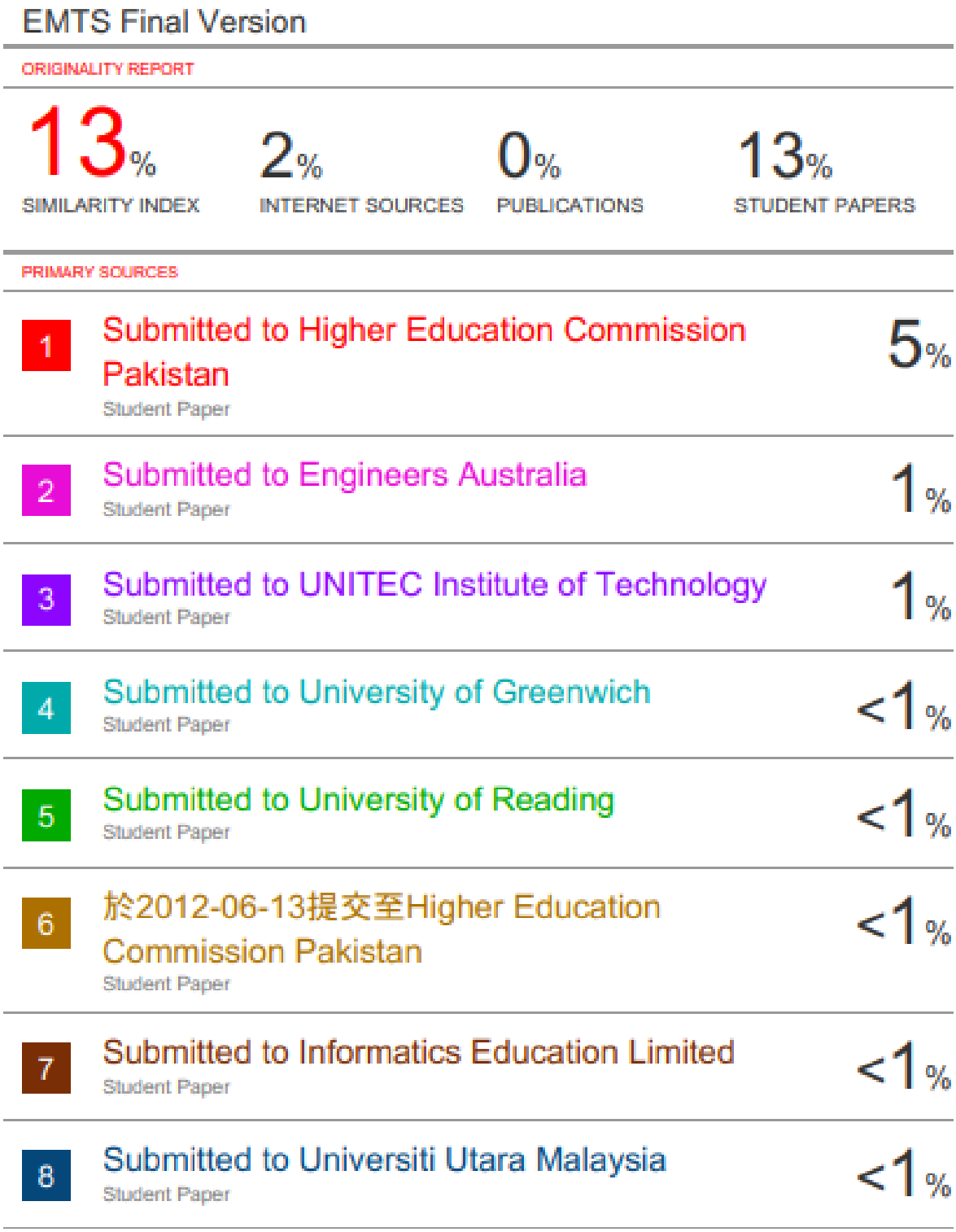

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