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TRANSPORT FACILITATION SYSTEM

In partial fulfilment of the requirements for the degree of

Bachelor of Science in Computer Science

Supervisor: Summaira Nosheen

Department of Computer Sciences

Bahria University, Lahore Campus

June 2018

C e r t i f i c a t e

We accept the work contained in the report titled
"TRANSPORT FACILITATION SYSTEM",
written by
FAAZ UDDIN USMANI
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as a confirmation to the required standard for the partial fulfilment of the degree of Bachelor of Science in Computer Science.

Approved by:

Supervisor: Ms. Summaira Nosheen

_____ (Signature)

June 4*th*, 2018

DECLARATION

We hereby declare that this project report is based on our original work except for citations and quotations, which have been duly acknowledged. We also declare that it has not been previously and concurrently submitted for any other degree or award at Bahria University or other institutions.

Enrolment	Name	Signature
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Date : 31th May, 2018

Specially dedicated to
my beloved grandmother, mother and father
(Faaz Uddin Usmani)
my beloved grandmother, mother and father
(Salman Imtiaz)

ACKNOWLEDGEMENTS

We would like to thank everyone who had contributed to the successful completion of this project. We would like to express our gratitude to my research supervisor, Madam Summaira Nosheen for her invaluable advice, guidance and her enormous patience throughout the development of the research.

In addition, We would also like to express our gratitude to our loving parent and friends who had helped and given me encouragement.

Faaz Uddin Usmani

Salman Imtiaz

TRANSPORT FACILITATION SYSTEM

ABSTRACT

Travelling in a public transport is always a problem since long time for everyone. Either Students, Job holders or aged people all have to wait for very long to get in the vehicle. It is very difficult to wait for a transport on stop in such hard weather of Pakistan. A platform is introduced which helps the passengers who travels on public transport by providing information of some important public transport means available in the city.

Schedule of buses and operational routes are available on this app. This platform provides the best available route from your current location to your desired destination which saves your time and also gives the comparison of fares among different available means of transportation to save your money. Transport Facilitation System provides all the information about local transport available on specific route for the users. Application automatically detects user's location through GPRS and ask user to specify their destination. User can also give its location manually. They can select a service from the list of available vehicle services. User can check the fare of a particular transport service and its timings. It will maintain complete schedule of given transportation services for the pre-defined routes. Transport administrator of any transport service which are listed above can upload and edit the route information of their service.

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LIST OF SYMBOLS / ABBREVIATIONS

SQL	Structured Query Language
LTC	Lahore Transport Company
GPS	Global Positioning System
IDE	Integrated Development Environment

CHAPTER 1

INTRODUCTION

1.1 Background

Travelling in a public transport is always a problem since long time for everyone. Either Students, job holders or aged people all have to wait for very long to get in the vehicle. And it is very difficult to wait in such hard weather of Pakistan. We are introducing a platform which helps the passenger who travels on public transport by providing them information of some important public transport means. This platform also provides the comparison of fares among different available means of transportation.

1.2 Problem Statements

We are going to develop an android application which facilitates users by providing them all the information about local transport available on specific route. Application automatically detects user's location through GPS and ask user to specify their destination. They can also select a service from the list of available vehicle services. For example, LTC, Speedo, Metro Bus and Metro Train. User can also check the fare of a particular transport service and its timings. The application also gives comparison of different transportation services on the basis of their fares.

It will also maintain complete schedule of given transportation services for the predefined routes. Transport administrator of any transport service can upload and

edit the route information of their service; they can also add/update notices about their services.

Key benefits of the application are:

- Saves time
- Provide better transport
- No need to stand and wait for the vehicle
- User can pre plan for a trip
- Comparison
- Authentication

1.3 Aims and Objectives

To develop an android application that facilitates users about public transport.

i) To save time of public transportation users
ii) To Provide better transport for public
iii) No need to stand and wait for the vehicle
iv) To provide user facility to pre plan for a trip
v) To make public transport better to avoid expensive private traffic (bikes and cars) on the roads.

1.4 Scope of Project

Android applications are gaining popularity amongst the people. We are including the already defined routes in our service. We are targeting the four major transport services of Lahore city, out of these three are currently operational LTC, Speedo, Metro bus (operational) and orange line metro train (not operational). This app can be used to get the information about buses and train.

Through our services we hope to accomplish following major goals:

Customers benefits:

- Time saving.
- Quality assurance.

- Consistent and timely service.
- Customer supportive.
- Customer comfort.
- Customer friendly.
- 24/7 availability
- Secure access control
- Authentic system
- Secure for user

Service providers benefit:

- Business start-up
- Better earning
- Better lifestyle

CHAPTER 2

SOFTWARE REQUIREMENT SPECIFICATION

2.1 Introduction

Purpose

The document describes the software requirement specification of Transport Facilitation System by providing all the information about local transport available on specific route for the users. Application automatically detects user's location through GPRS and ask user to specify their destination. User can also give its location manually. They can select a service from the list of available vehicle services. For example, LTC, Speedo, Metro Bus and Orange line metro Train (not operational). User can check the fare of a particular transport service and its timings. The application also gives comparison of different transportation services on the basis of their fares. It will maintain complete schedule of given transportation services for the pre-defined routes. Transport administrator of any transport service which is listed above can upload and edit the route information of their service.

Scope

Android applications are gaining popularity amongst the people. We are including the already defined routes in our service. We are targeting the four major transport services of Lahore city, out of these three are currently operational LTC, Speedo, Metro bus (operational) and orange line metro train (not operational). They can easily use our app to get the facility of buses and train.

Through our services we hope to accomplish following major goals:

Customers benefits:

- Time saving.
- Quality assurance.
- Consistent and timely service.
- Customer supportive.
- Customer comfort.
- Customer friendly.
- 24/7 availability
- Secure access control
- Authentic system
- Secure for user

Service providers benefit:

- Business start-up
- Better earning
- Better lifestyle

2.2 Overall Description

User Classes and Characteristics

There would be three types of user which will interact with the application, User, Bus Admin and System Administrator. So, all of them would have different type of requirements.

Schedule of buses and operational routes is available on this app. This platform provides the best available route from your current location to your desired destination which saves your time and also gives the comparison of fares among

different available means of transportation to save your money. Customer will request for a bus from available services. So, customer can see the timings of transport. If the transport is not available on the route due to any reason than the Bus Admin can generate a notification for all the users of unavailability of transport. System Admin panel will be on the web portal to monitor all the activities.

Operating Environment

An android based application which will run on at least android version 4.4 to 4.4.4 kit Kat or greater than this. For admin panel the minimum INTEL core i3 laptop or pc with having minimum 4GB RAM. Hosting services would be required a domain and a server.

Design and Implementation and Constraints

The IDE (Android Studio) used for android development is a heavy software it requires best machines for development otherwise it becomes leggy and take too much time. The main constraint for our project implementation is integration.

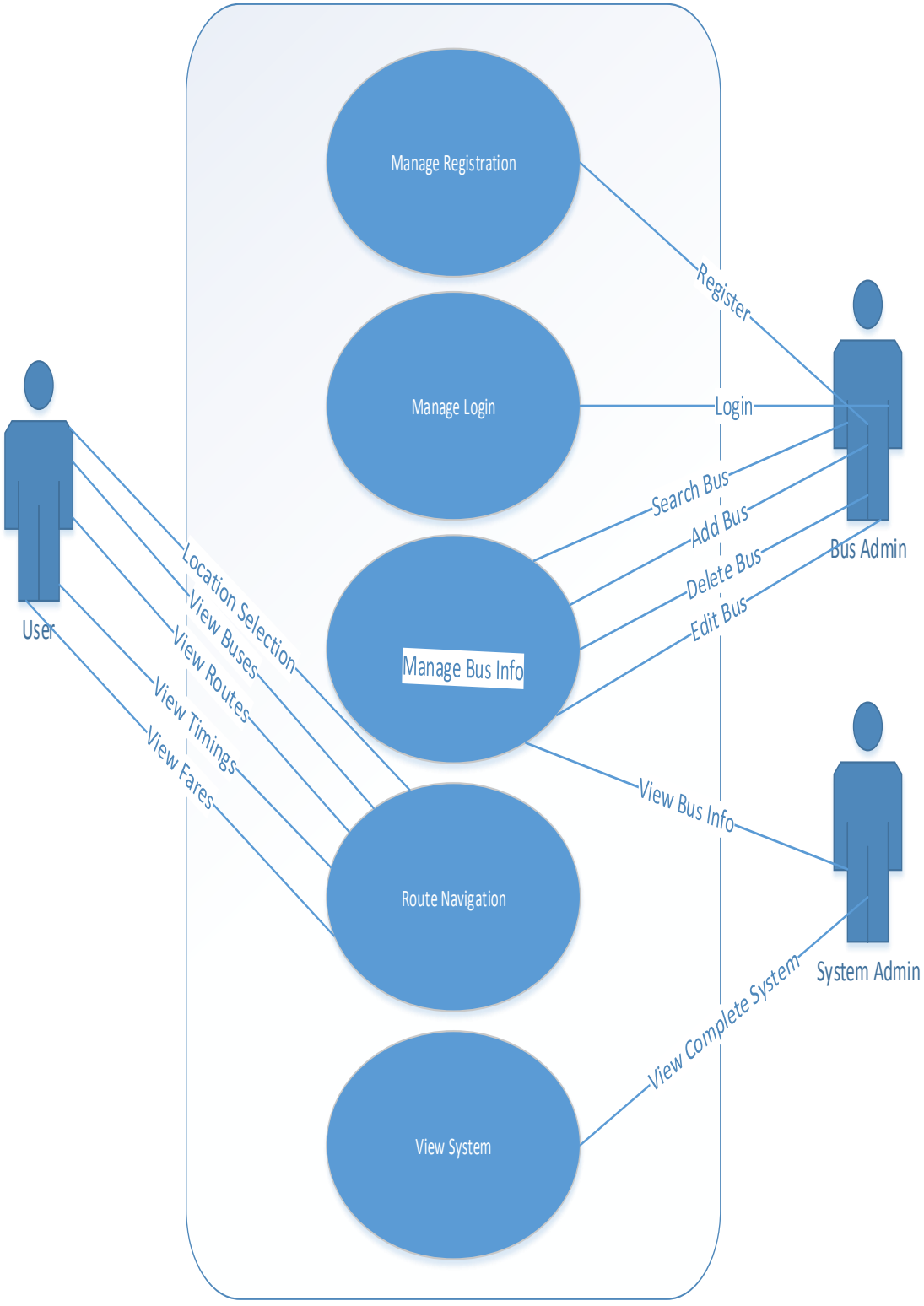
Assumption and Dependencies

It is assumed that the traveller in Pakistan would like to work through mobile phone they would be familiar with the applications and familiar with internet usage. The whole application is internet based so there is a need of internet every time. It will be expected that the worker and clients will have fair internet. It is also assumed that the GPS of the android device is enabled.

2.3 System Use Cases

Use Case Name: Transport Facilitation System	**Id:** A-1	**Priority:** High
Actors: User, Bus Admin, System Admin		
Description: This system provides the information about public transport.		
Trigger: User requires an internet connection. **Type:** External		
Preconditions: 1. **User required an internet connection on mobile.** 2. **Bus Admin Must be registered first.**		
Normal Course: Information of Steps 1. Apps will automatically get the location of the user through GPRS. 1.1.User can also enter the location manually. 1.2. User can view the Buses fares. 1.3. User can view the timings. 1.4. User can view the routes. 1.5.User can select a service. 2. Bus Admin will register first. ← Name and password 2.1.System will approve the request. → Confirmation 3. Bus Admin Manage the Bus information. 3.1.Change the bus route. → Request 3.2.Change the fares. ← Confirmation 3.3.Change the timings. 4. Bus Admin can generate a notification about buses. 5. System Admin can view all the activities.		
Alternative Course: 1. No bus is available on the selected route. 2. Internet is not available.		
Post Conditions: 1. Database is accessible. 2. App is responding properly.		

Summary Inputs	**Source**	**Outputs**	**Destination**
Bus Admin Name and Password	Bus Admin	Conformation Notification	Bus Admin


Manage Registration
Manage Login
Manage Bus Info
Route Navigation
View System
Register
Login
Search Bus
Add Bus
Delete Bus
Edit Bus
Bus Admin
View Bus Info
System Admin
View Complete System
User
Location Selection
View Buses
View Routes
View Timings
View Fares

Manage Registration (U1)

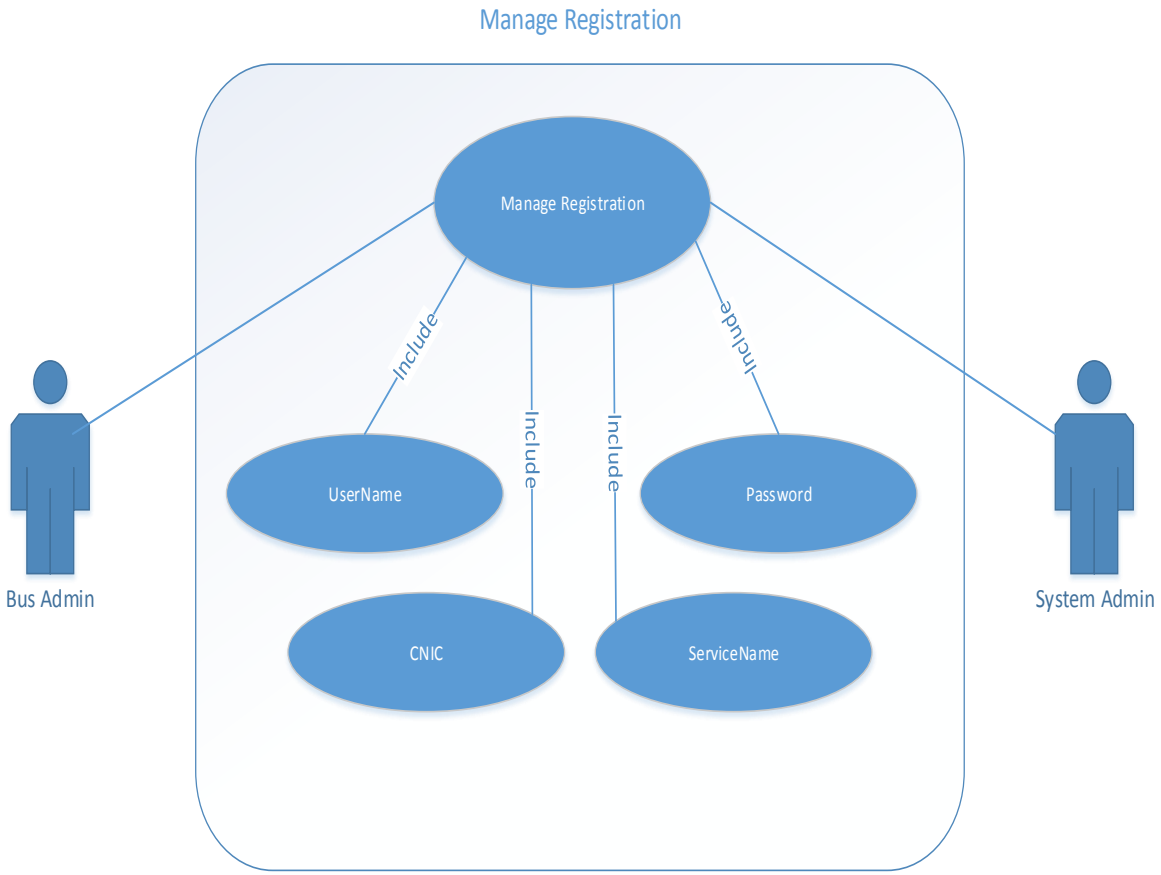
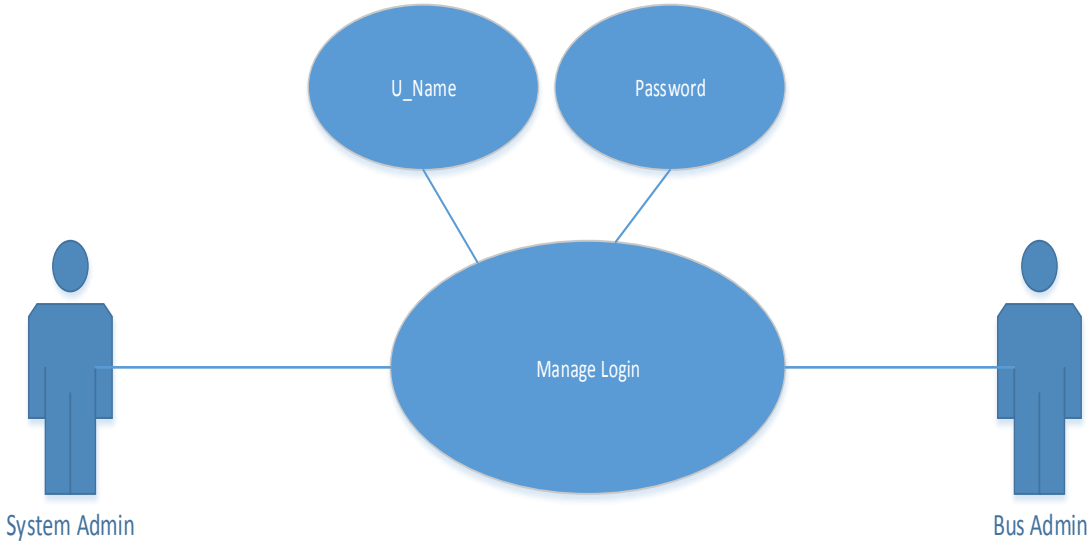


Figure 2-1 Manage Registration

Table 2-1

Unique Identifier	**U1**
Objective	It is use for the registration of bus administrator, to check the authenticity. System Admin view all the activities.
Priority	High
Source	Bus Admin
Actors	Bus Admin& System Admin
Flow of Event	**Basic Flow** 1.2. Bus Admin fill the required fields. Move to the main screen **Alternative Flow** 1. If already registered move to the login screen.
Includes	None
Pre-Conditions	User must be connected with internet.
Post-Conditions	Move to the login screen

Manage Login (U2)



Unique Identifier	**U2**
Objective	To secure the Bus Admin account.
Priority	High
Source	Bus Admin
Actors	Bus Admin & System Admin.
Flow of Event	**BASIC FLOW** 1. Bus Admin enters the username and password. 2. Validating of username and password. 3. User redirected to main screen, of their account. **ALTERNATIVE FLOW** 1. User cannot use same credentials for another account
Includes	U1
Pre-Conditions	User must be connected with internet and must remember the username and password.
Post-Conditions	Move to the main screen or log in or log out.

Table 2-2 Manage Login

Manage Bus information (U3)

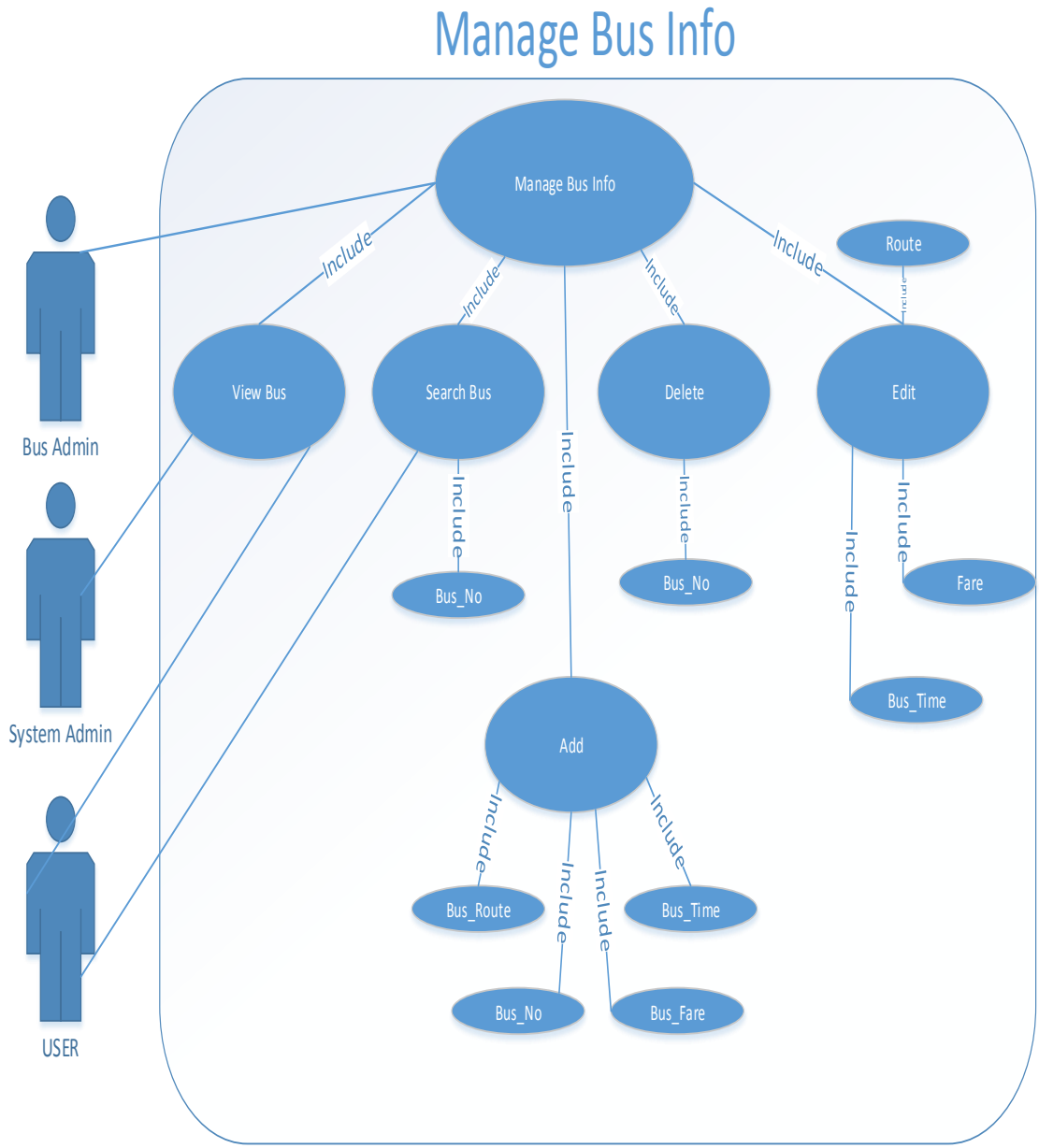


Figure 2-2 Manage Bus Info

Manage Bus Info

Table 2-3

Unique Identifier	**U3**
Objective	A screen will open for Bus Admin Where CRUD operations will be performed from it. Notifications will also be generated from there.
Priority	High
Source	Bus Admin
Actors	Bus Admin & System Admin
Flow of Event	**BASIC FLOW** 1. Bus Admin can enter information of buses (Timings, Fares, routes). 2. Generate the notification. **ALTERNATIVE FLOW** 1.Bus Admin can move for the complete view.
Includes	U2
Pre-Conditions	Bus Admin must be connected with internet.
Post-Conditions	Go for system view.

Route navigation (U4)

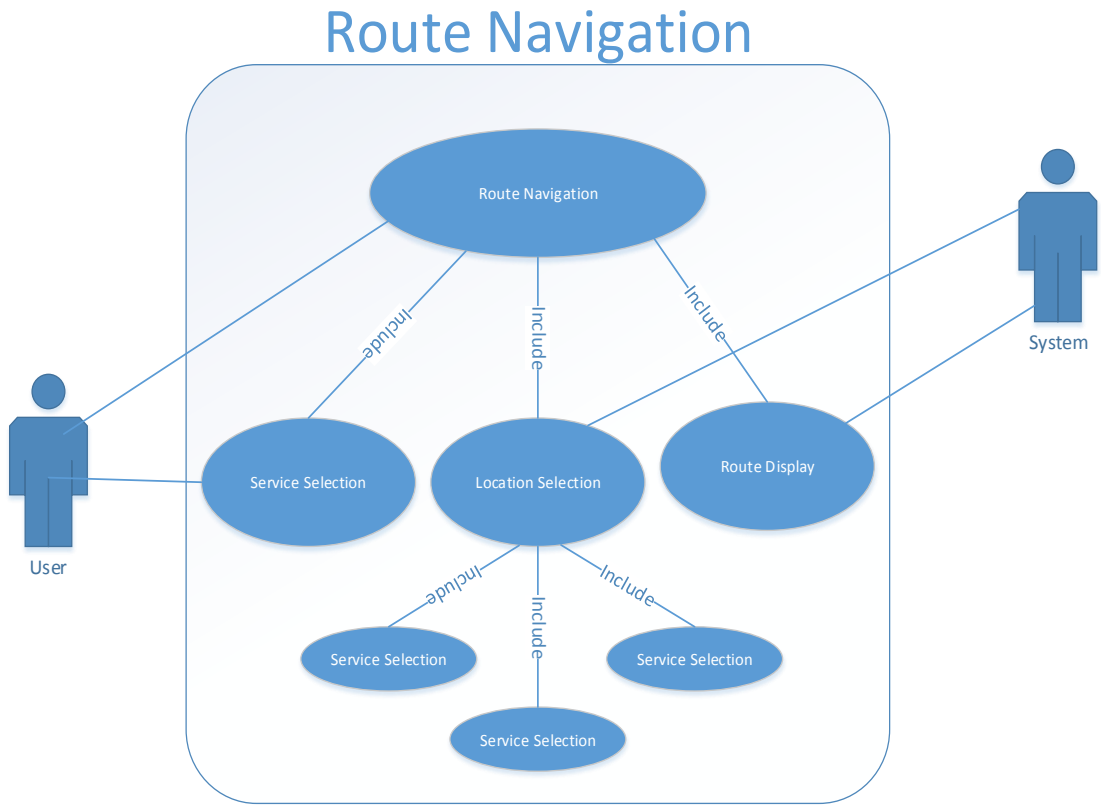


Figure 2-3 Route Navigation

Table 2-4

Unique Identifier	**U4**
Objective	User can view the routes, fares, timings.
Priority	High
Source	User
Actors	User & System Admin
Flow of Event	**BASIC FLOW** 1. Turn on the GPS. 2. See the transport. **ALTERNATIVE FLOW**
	1. User can view the fares, routes, timing without GPRS.
Pre-Conditions	User must be connected with internet.

View System (U5)

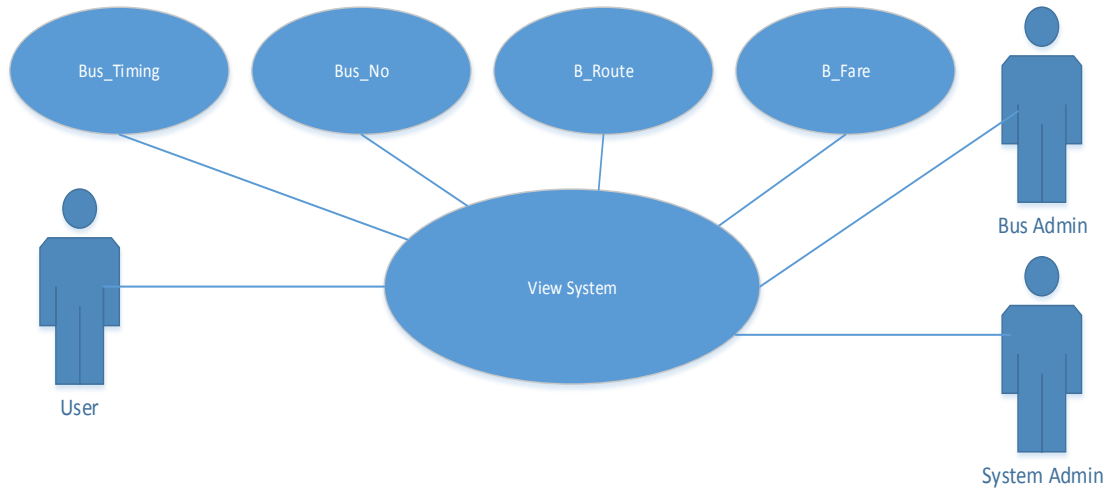


Figure 2-4

Unique Identifier	**U5**
Objective	All the actors can view the system.
Priority	High
Source	Bus Admin
Actors	User, Bus Admin and System Admin.
Flow of Event	**BASIC FLOW** 1. User can view all information about buses. **ALTERNATIVE FLOW**
Includes	
Pre-Conditions	1. The user must have an active internet connection 2. The Bus Admin must be logged in.
Post-Conditions	

Table 2-5 View System

2.4 Other Non-functional Requirements

Performance Requirements

Transport Facilitation System application requires a GPS enabled android phone to work with at least version 4.4 Kit Kat. Phone should have at least 2GB of ram and expected 100MB of free space.

Safety Requirements

The developer team can update the application after launch, so the developers can resolve the issue(s).

Security Requirements

Transport Facilitation System does not have any security requirements and thus any type of user can use it without any additional privileges. Only the authorized person can add, delete and update the bus information

Software Quality Attributes

Transport Facilitation System provides the users with some unique features like time based. Due to its well designed and easy to use interface it can use both by experts and typical users however users (workers) mJust have basic knowledge of English for customers and Urdu language for workers and know how to write in Urdu before using the application.

2.5 Other Requirements

- Vehicle route optimization
- Enable GPS settings
- Cost comparison
- Addition of transport
- Termination of transport
- Updating of transport
- Updating route
- Updating fare
- Generate alerts
- Edit schedule
- Update to register
- Provide route information
- Updating about cancelation
- Check for someone
- Transport availability
- Change of route alerts
- Bus service comparison

Response Time

The response time should not be more than 5 seconds although the wish is that it should not be more than 1 percent 100 percent of the time.

Accuracy of Interpretation

Application must maintain at least 70 percent accuracy although it should be 100 percent accuracy at most.

2.6 System Requirement Chart

Requirement No	Priority	Type	Source	Contained in Use Case	Description
SR1	High	Functional	Bus Admin	U1	It is use for the registration of bus administrator, to check the authenticity. System Admin view all the activities.
SR2	High	Functional	Bus Admin	U2	To secure the Bus Admin account.
SR3	High	Functional	Bus Admin	U3	A screen will open for Bus Admin Where CRUD operations will be performed from it. Notifications will also be generated from there.
SR4	High	Functional	User	U4	User can view the routes, fares, timings.
SR5	High	Functional	Bus Admin	U5	All the actors can view the system.

CHAPTER 3

DESIGN AND METHODOLOGY

3.1 Introduction

This document specifies the steps required to develop the Transport Facilitation System, describes all data, functional and behavioural requirements of the software under development. The resulting system should be secure. As a user; system will be easy to use. Document includes:

1. Use case description
2. Use case diagram refined
3. Domain Model
4. Sequence Diagram
5. Collaboration Diagram
6. Operation Contracts
7. Design Class Diagram

These are as follows:

Usecase Description

Brief description

There would be three types of user which will interact with the application, User, Bus Admin and System Administrator. So, all of them would have different type of requirements. Schedule of buses and operational routes is available on this application. This platform provides the best available route from your current location to your desired destination which saves your time and also gives the comparison of fares among different available means of transportation to save your money. Customer will request for a bus from available services. So, customer can

see the timings of transport. If the transport is not available on the route due to any reason than the Bus Admin can generate a notification for all the users of unavailability of transport. System Admin panel will be on the web portal to monitor all the activities.

Preconditions

User required an internet connection on mobile.

Bus Admin Must be registered first.

Basic flow

Apps will automatically get the location of the user through GPRS.

- User can also enter the location manually.
- User can view the Buses fares.
- User can view the timings.
- User can view the routes.
- User can select a service.

Bus Admin will register first.

- System will approve the request.

Bus Admin Manage the Bus information.

- Change the bus route.
- Change the fares.
- Change the timings.

Bus Admin can generate a notification about buses.

System Admin can view all the activities.

Alternate flows

No bus is available on the selected route.

Internet is not available.

Post conditions

Database is accessible.

App is responding properly

Usecase Diagram

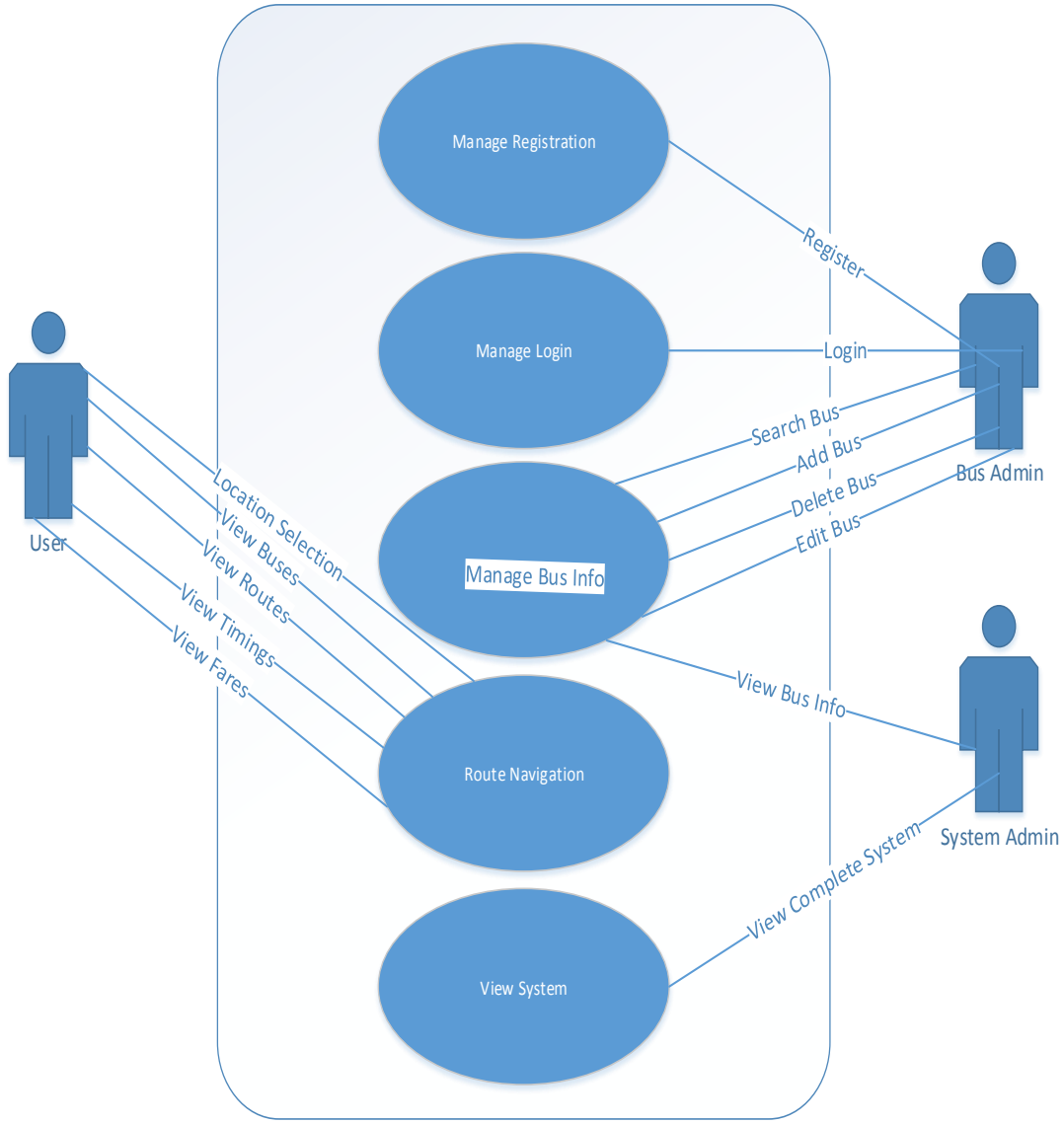


Figure 3-1 Usecase Diagram

Domain Model

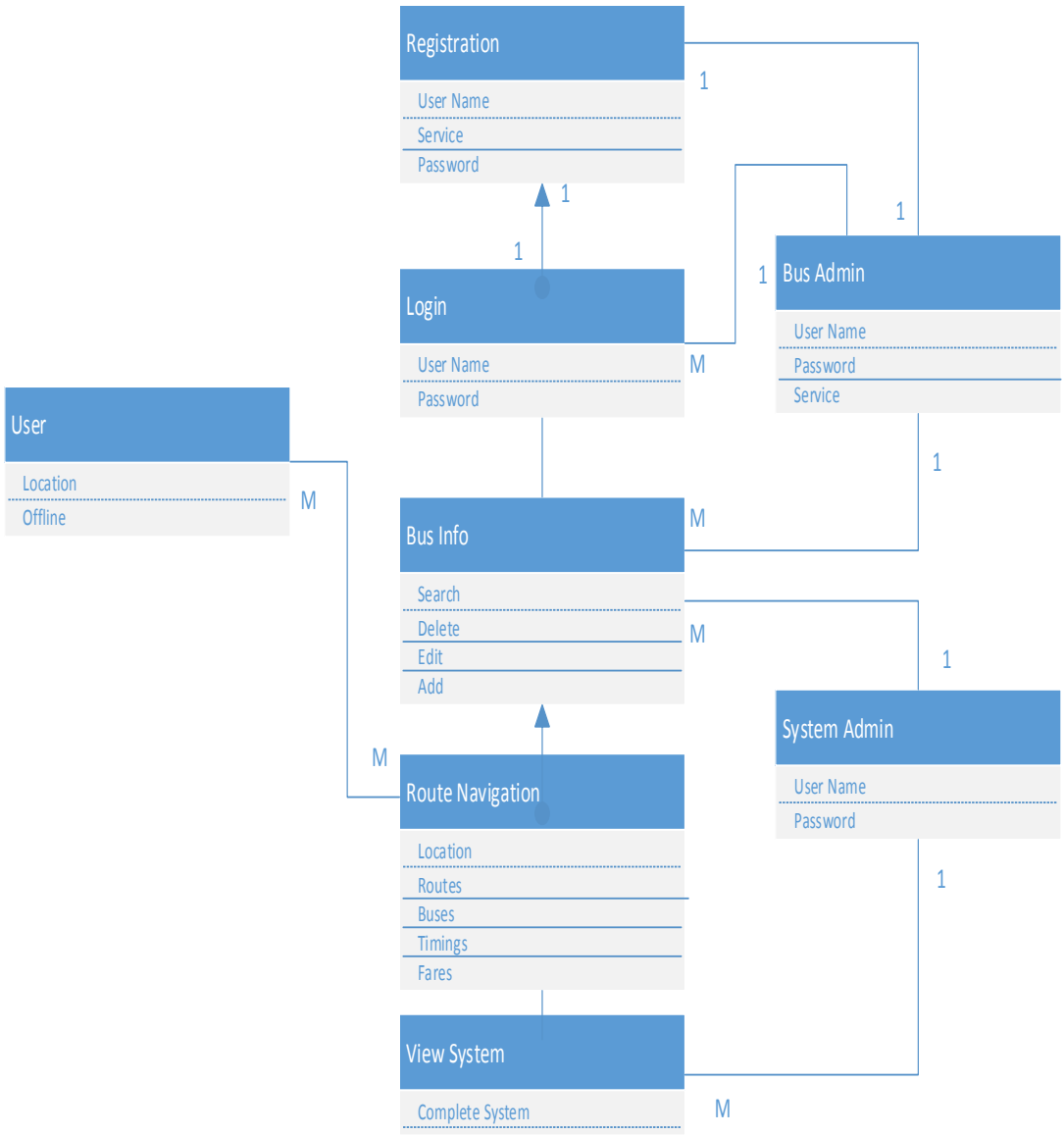


Figure 3-2 Domain Model

Domain Model Description:

Bus Admin will get registered first, after that Bus Admin will apply for login. Bus Admin is able to enter bus information, edit bus information, update and delete the data. User is able to view the bus routes, bus timings, bus fares and can view the required bus.

Sequence Diagram

Sequence Diagram (Registration)

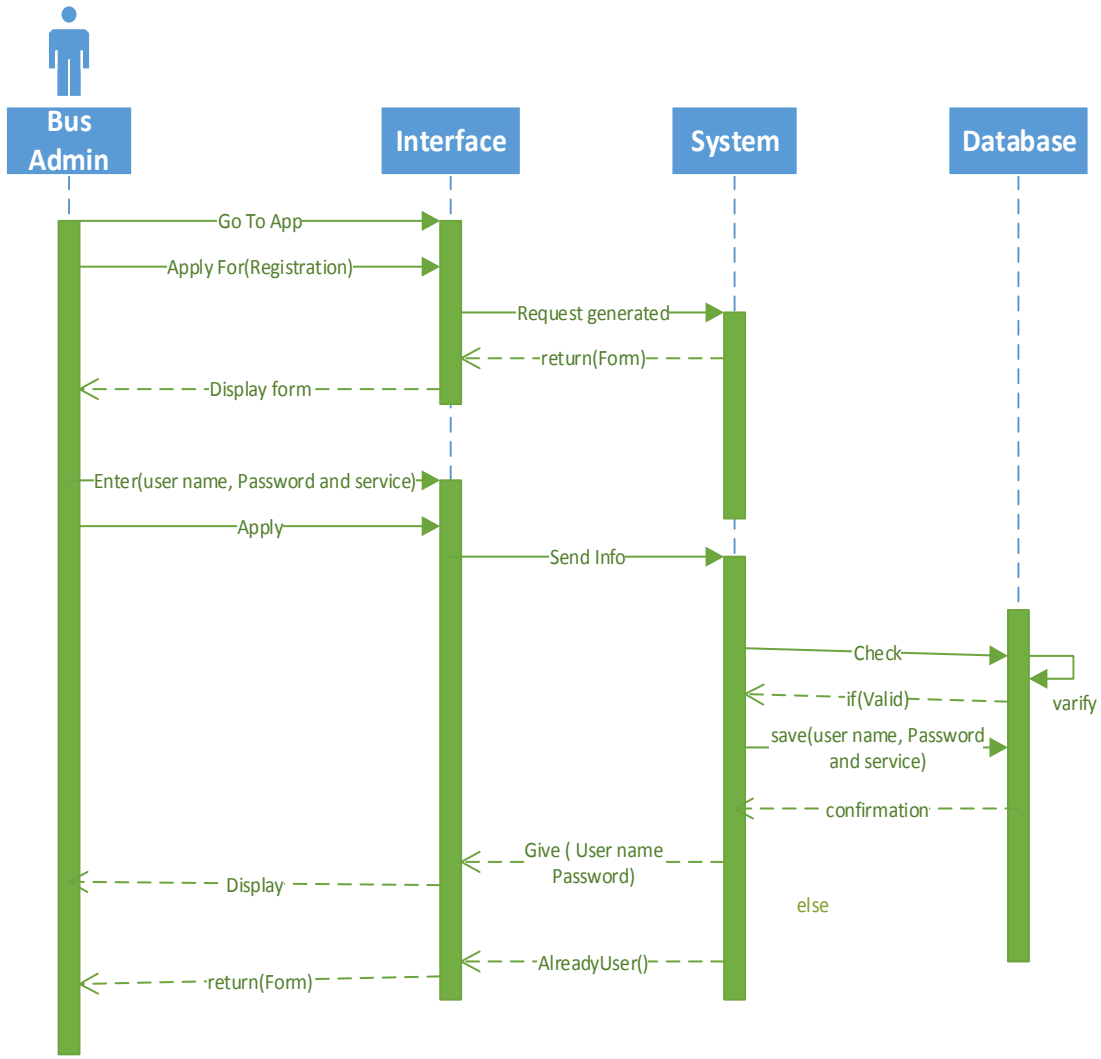


Figure 3-3

Description: Bus Admin will apply for registration by filling up the registration form on interface, after that interface will send that particular information to the system. Systems will a request to database to store the data.

Sequence Diagram (Login)

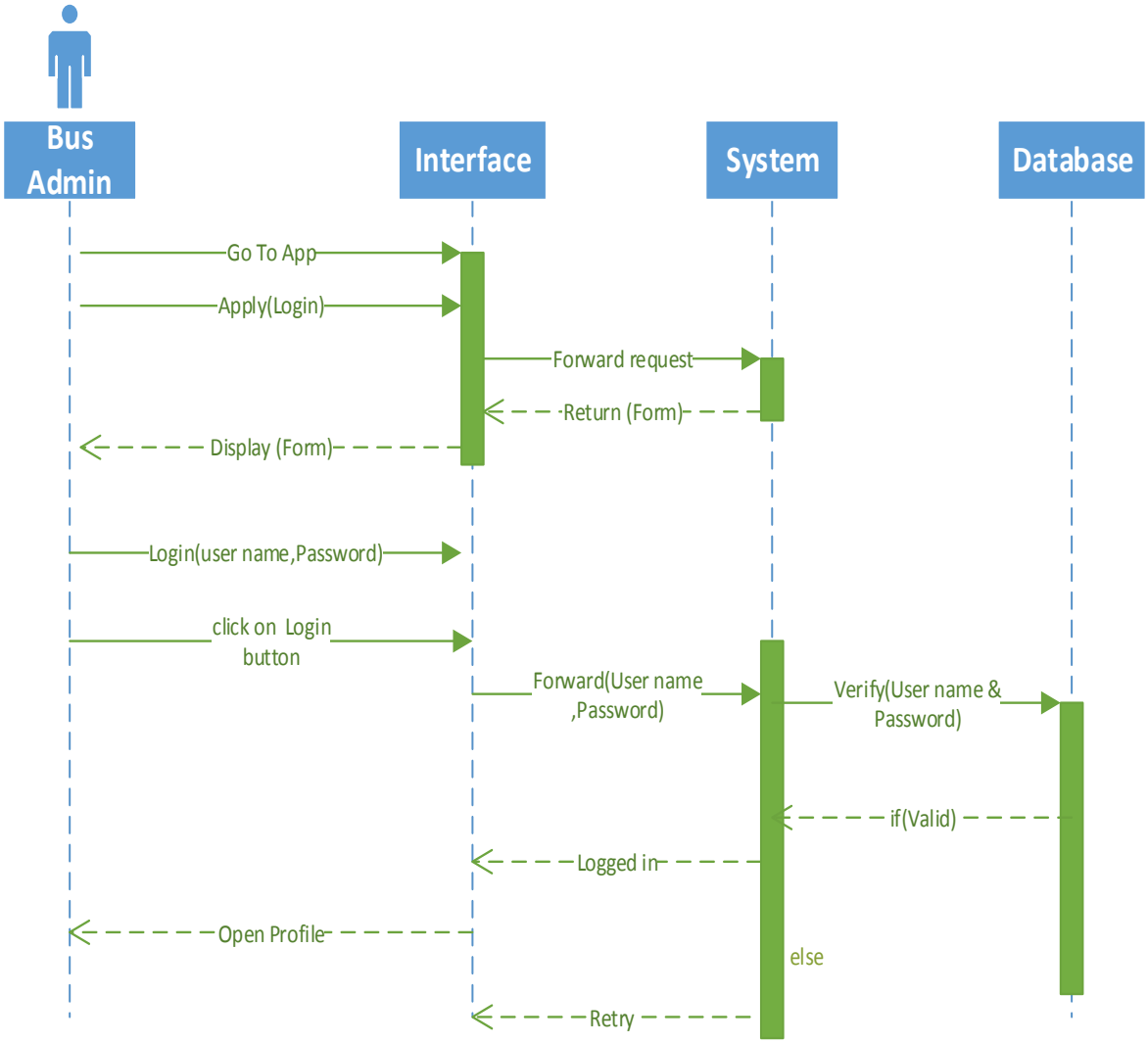


Figure 3-4

Description: Bus Admin have to fill up all the credential which are on login page to get logged in. After that interface will send a request to verify the credential to the system, system will verify from the database. If credentials are true the Bus Admin move to the next screen, otherwise it will show an error.

Sequence Diagram (Manage Bus Info)

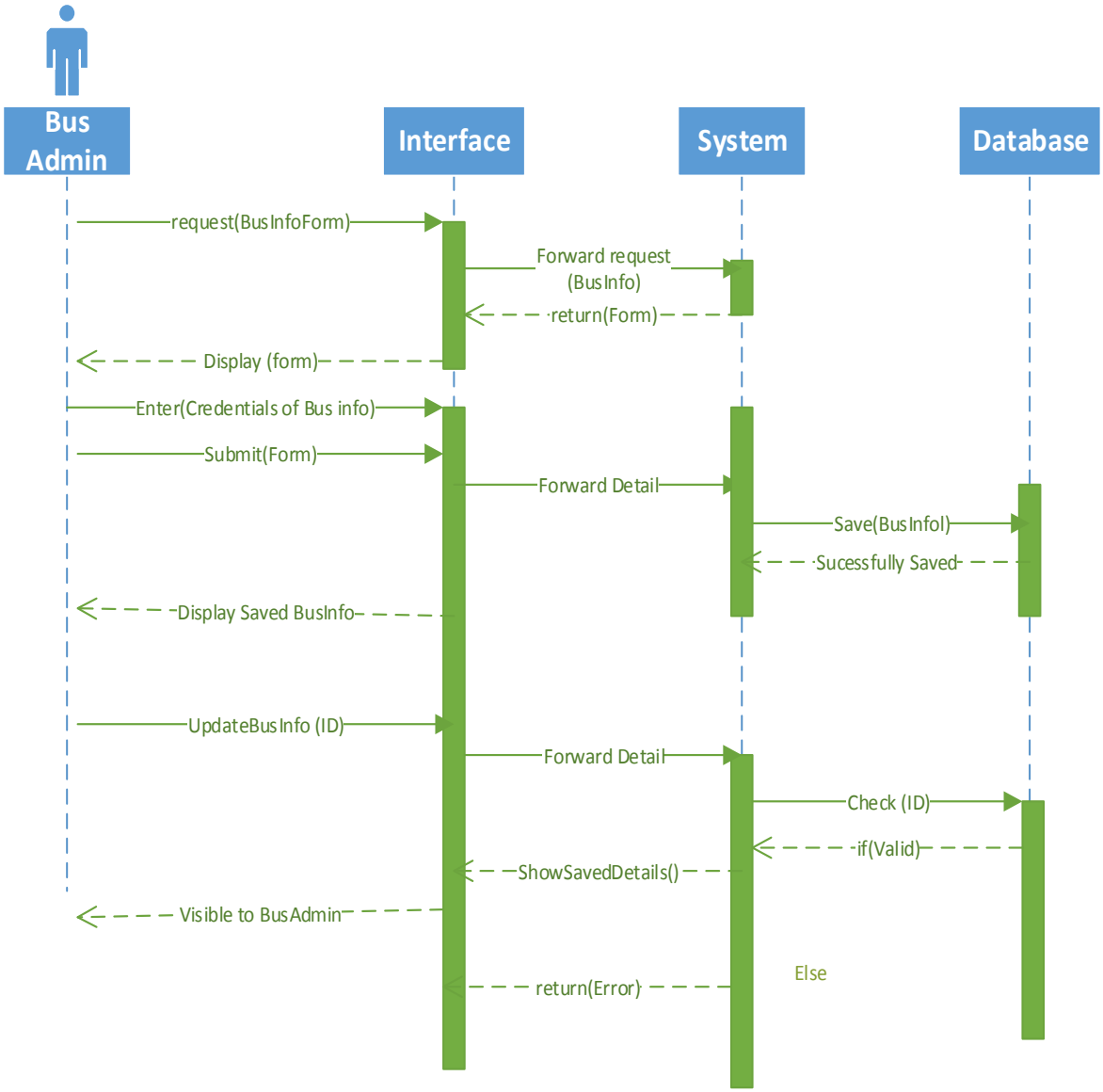


Figure 3-5

Description:

Bus Admin will enter the bus information by filling up the credentials. That credentials will be saved on database. System will show a success message to the Bus Admin.

Sequence Diagram (Route Navigation)

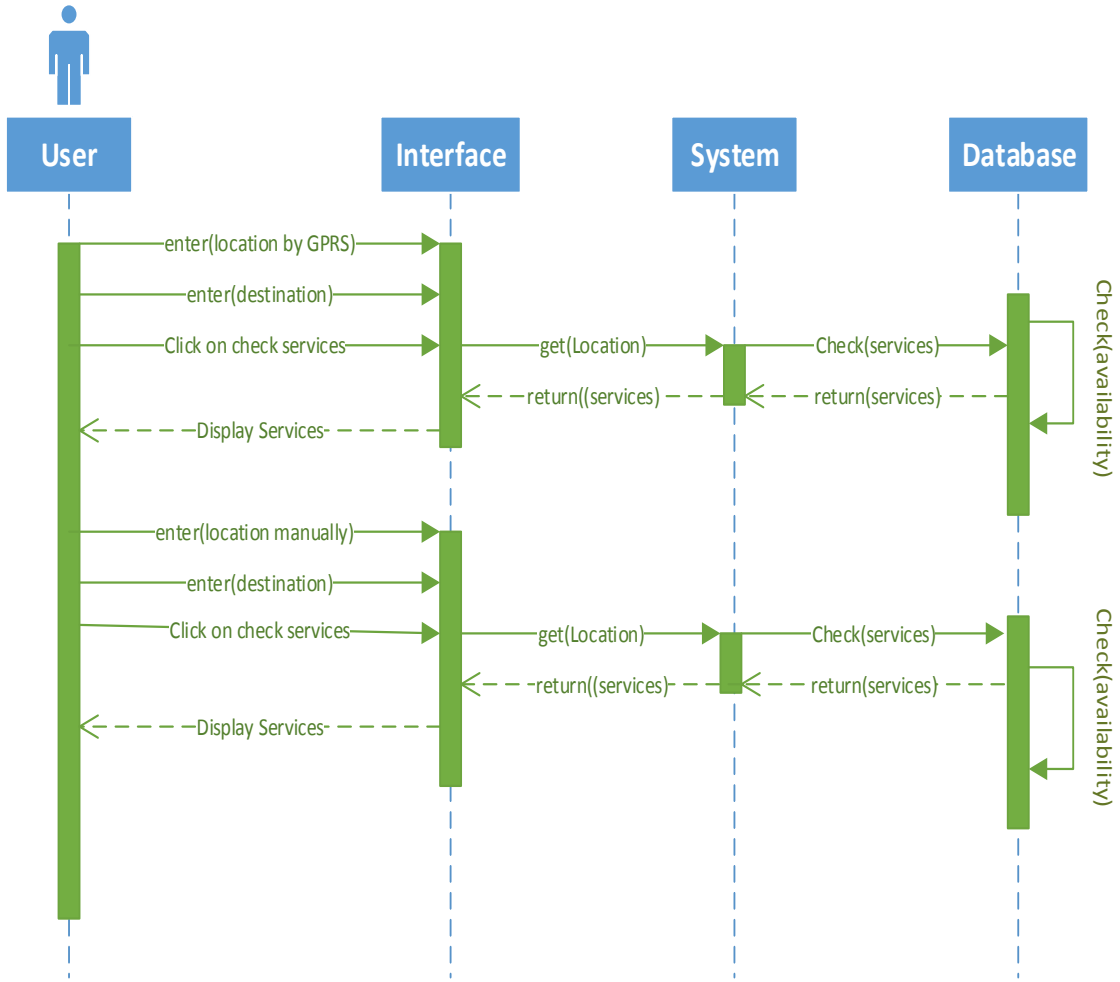


Figure 3-6

Description:

User will turn on the location, enter the destination, interface will send that location the system, system will ask the database to show specific routes which are available between the user's current location and the desired location.

Sequence Diagram (View System)

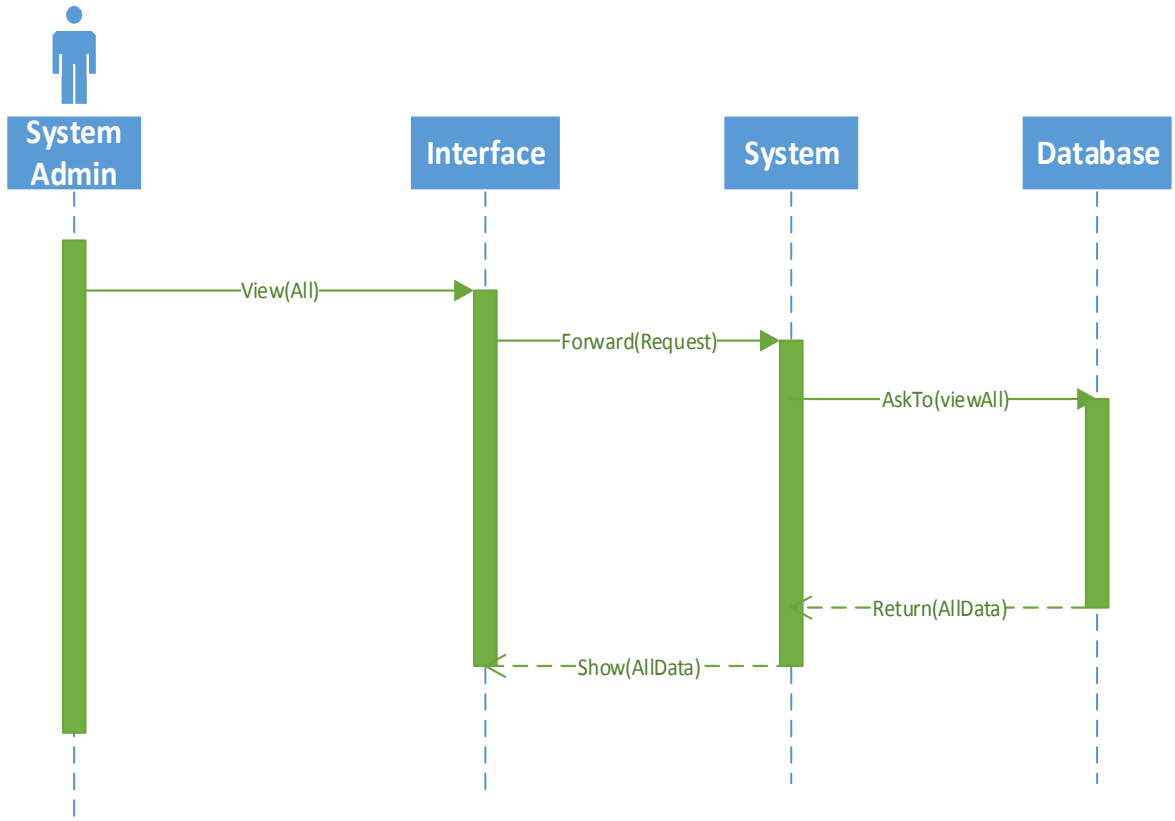


Figure 3-7

Description:

System Admin will send a request to the interface to view all the activities which are running on the application. Interface will forward that request to the system. System will forward a request to the database and database will respond on that request.

Collaboration Diagram

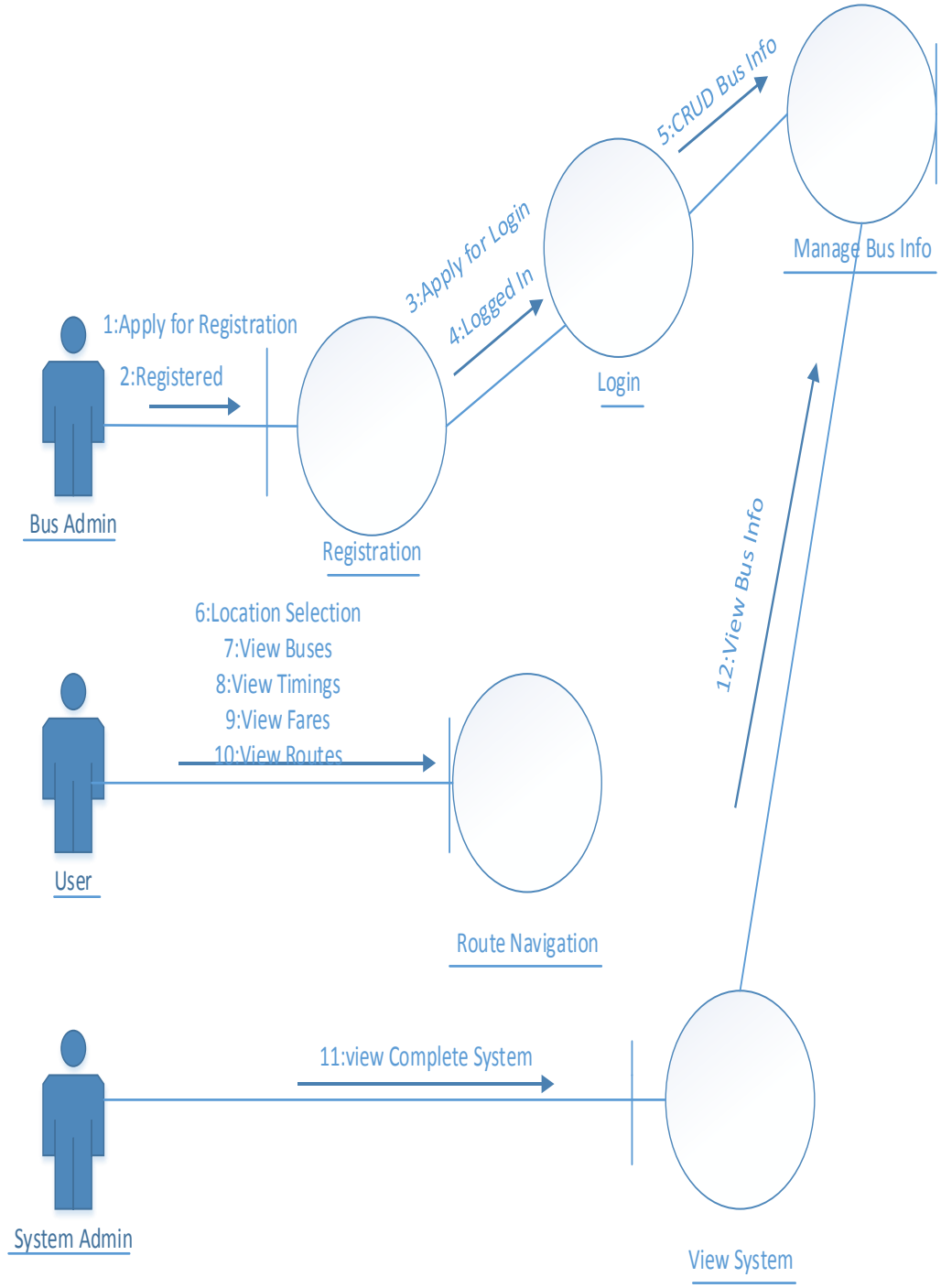


Figure 3-8

Description:

Bus Admin will get registered first, after that Bus Admin will apply for login. Bus Admin is able to enter bus information, edit bus information, update and delete the data. User is able to view the bus routes, bus timings, bus fares and can view the required bus.

Operation Contracts

- Name: Registration

Responsibilities: Registration (Username, Password)

Cross References: Use Cases: Manage Registration

Exceptions: none

Preconditions: Internet connection must be there.

Postconditions: Move to the main screen.

- Name: Login

Responsibilities: Login (Username, Password)

Cross References: Use Cases: Login

Exceptions: none

Preconditions: User must be connected with internet and must remembered the username and password.

Postconditions: Move to the main screen.

- Name: Manage Bus Info

Responsibilities: Manage Bus Information (Search, Delete, Edit, Add)

Cross References: Use Cases: Manage Bus Info

Exceptions: none

Preconditions: Bus Admin must have registered and logged in.

Postconditions: Go for system view.

- Name: Route Navigation

Responsibilities: Show availabilities of buses (Location, Route, Buses, Timing, Fares)

Cross References: Use Cases: Route Navigation

Exceptions: none

Preconditions: GPRS must be on and user is connected with internet.

Postconditions: Route will be shown by the application.

- Name: View System

Responsibilities: To show complete system.

Cross References: Use Cases: View System

Exceptions: none

Preconditions: Must have internet connection.

Postconditions: Application will show the required results.

Design Class Diagram

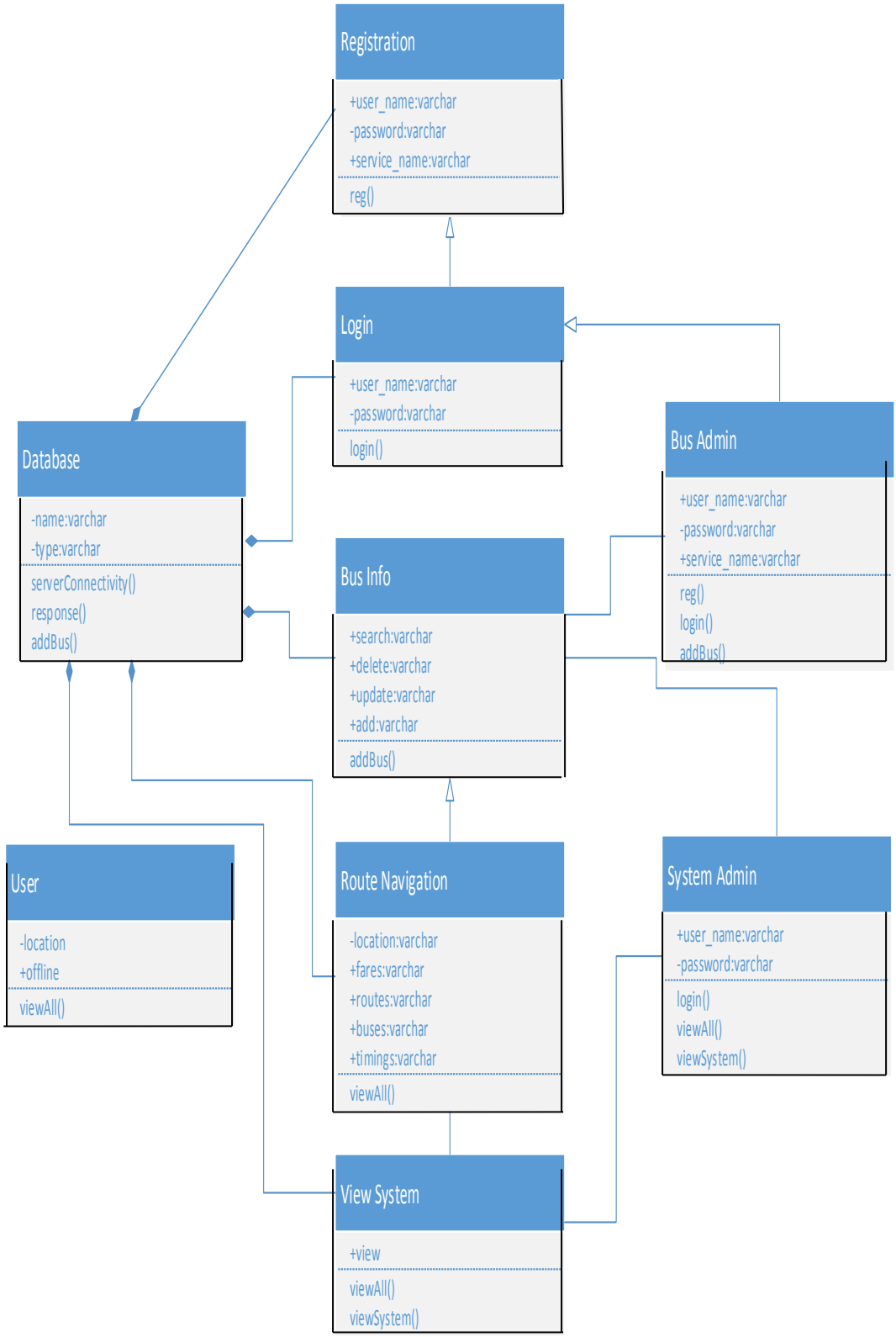


Figure 3-9 Class Diagram

Class Diagram Description:

Table 3-1

Class	Purpose	Overview
Registration	Bus Admin apply for registration. Bus Admin got registered here.	The service provider (bus admin), will gave the username, password and the service name to get registered.
Login	Bus Admin will apply for login.	Bus Admin got logged in.
Bus Info	To add a bus, update information.	A screen will open for Bus Admin Where CRUD operations will be performed from it. Notifications will also be generated from there.
Route Navigation	To view the related bus information after getting the user's location.	User can view the routes, fares, timings
View System	To view all the activities by the System administrator.	System Administrator can view the system.
Database	A database will be created to store the information of buses.	The database will interact with throughout the system execution.

User	User will interact with the system to get required information.	User can view the bus fares, bus timings, bus routes and can view the related notification.
Bus Admin	Bus Admin will interact with system to add information about buses.	Bus Admin will perform CRUD operations.
System Admin	View all the operations of system.	System Admin will view all activities going in application.

CHAPTER 4

IMPLMENTATION

4.1 Technologies Used

Java:

Java language is being used for android base application development.

SQL:

SQL is used for database handling.

For Fire Bases Handling.

4.2 Tools

Android Studio:

The whole application is developed by using android studio.

Version: 3.0.1

CHAPTER 5

USER MANUAL

5.1 System Requirement:

Device	Version	RAM	Space
Android Phone	Marshmallow or Above	2GB or Above	20MB or Above

5.2 Sign Up

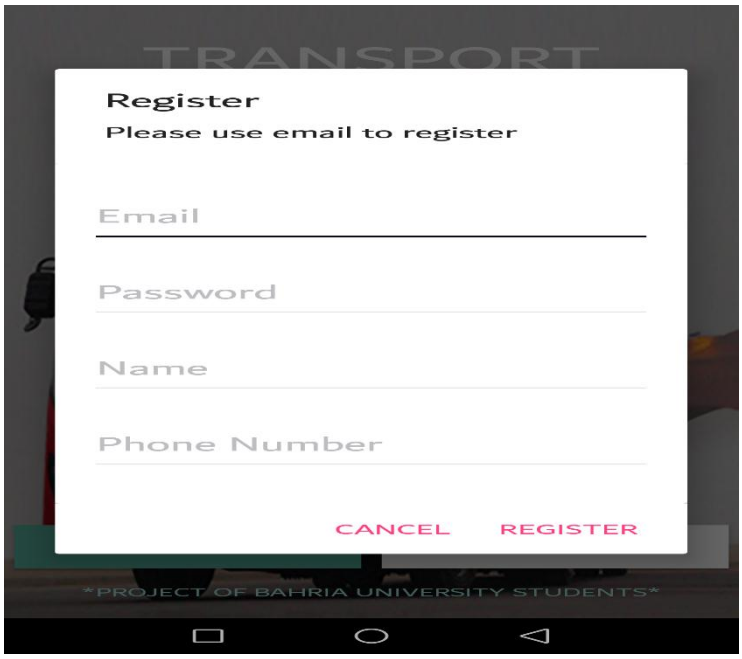


Figure 5-1 Figure 5-2

Enter your Email Address , Password, Name and Phone No. for signing up.

5.3 Sign In

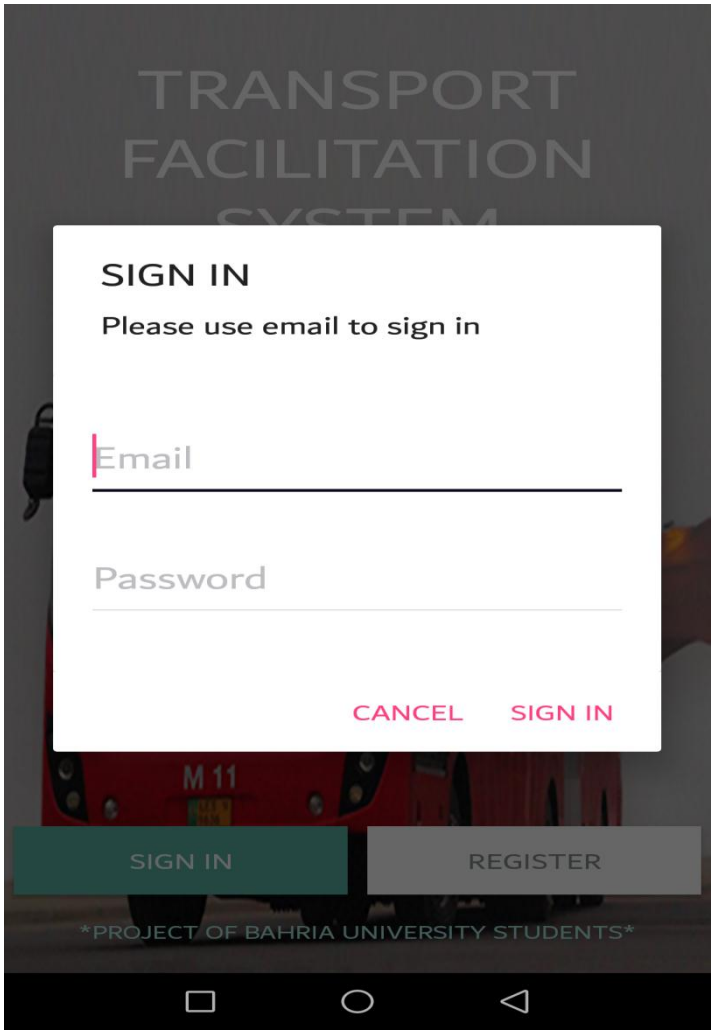


Figure 5-3

Enter your Email Address and a Password for signing In.

5.4 Main Menu

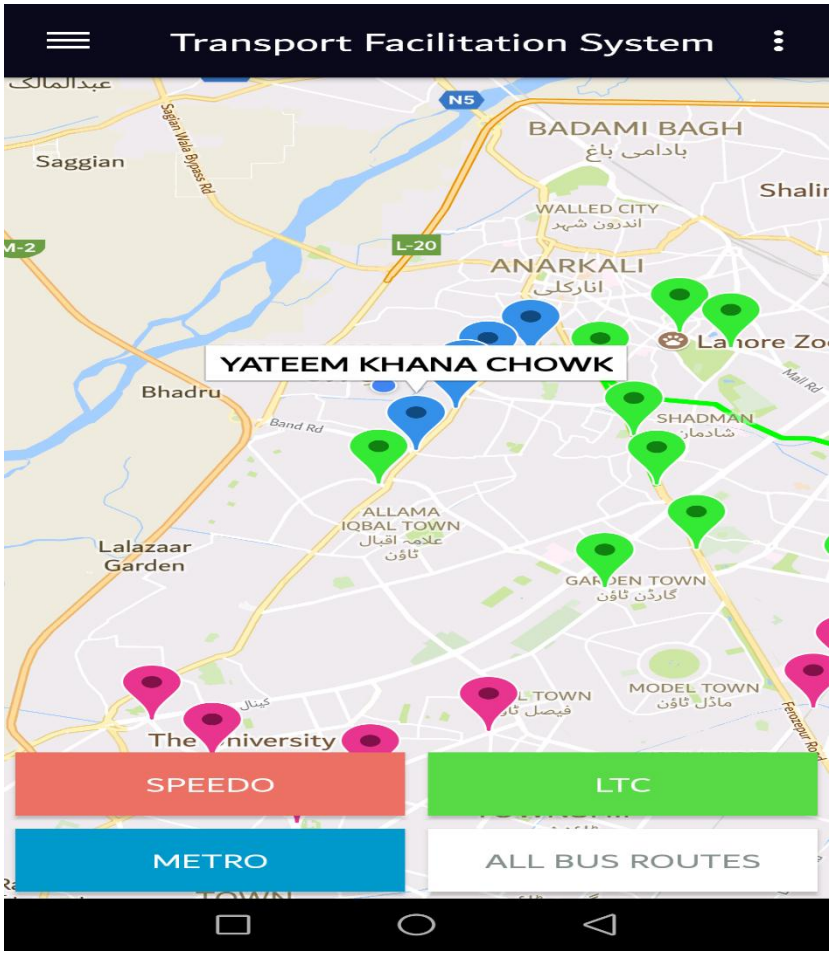


Figure 5-4 Main Menu

5.5 Speedo

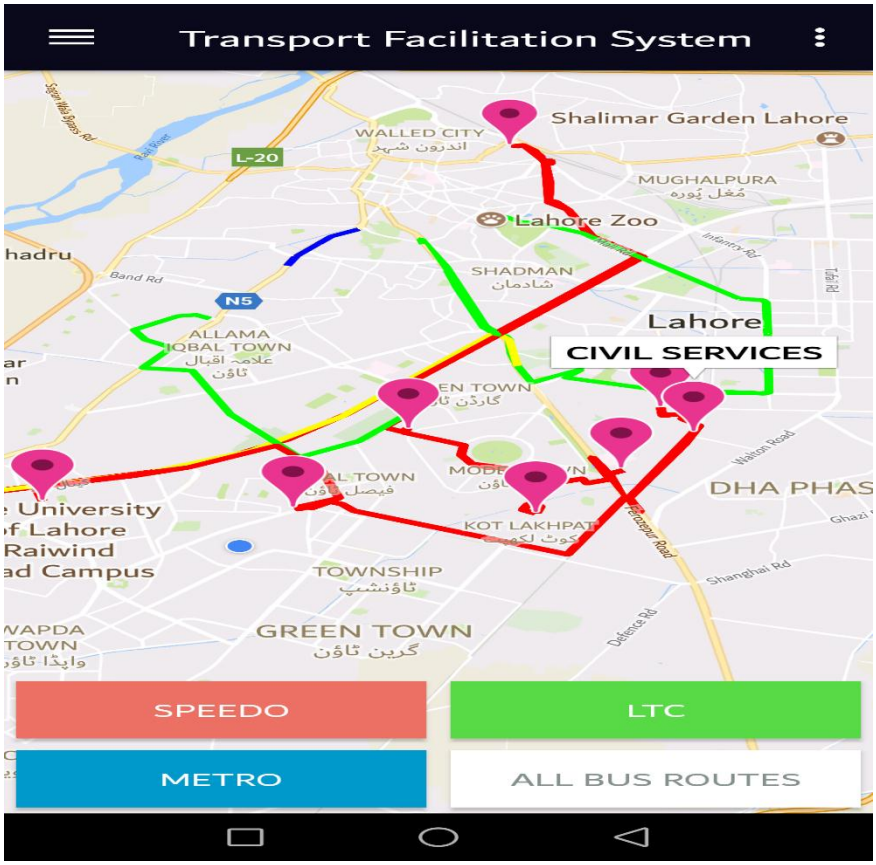


Figure 5-5 Speedo

5.6 Metro

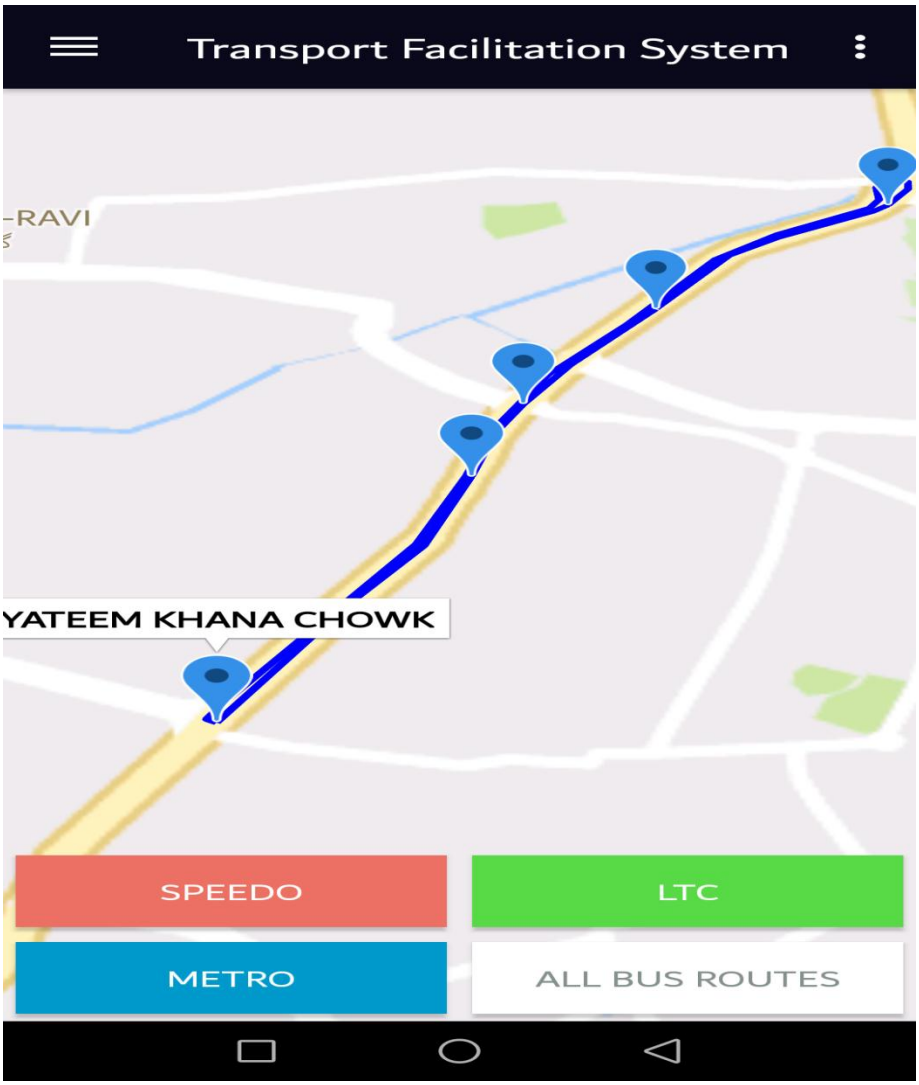


Figure 5-6 Metro

5.7 LTC

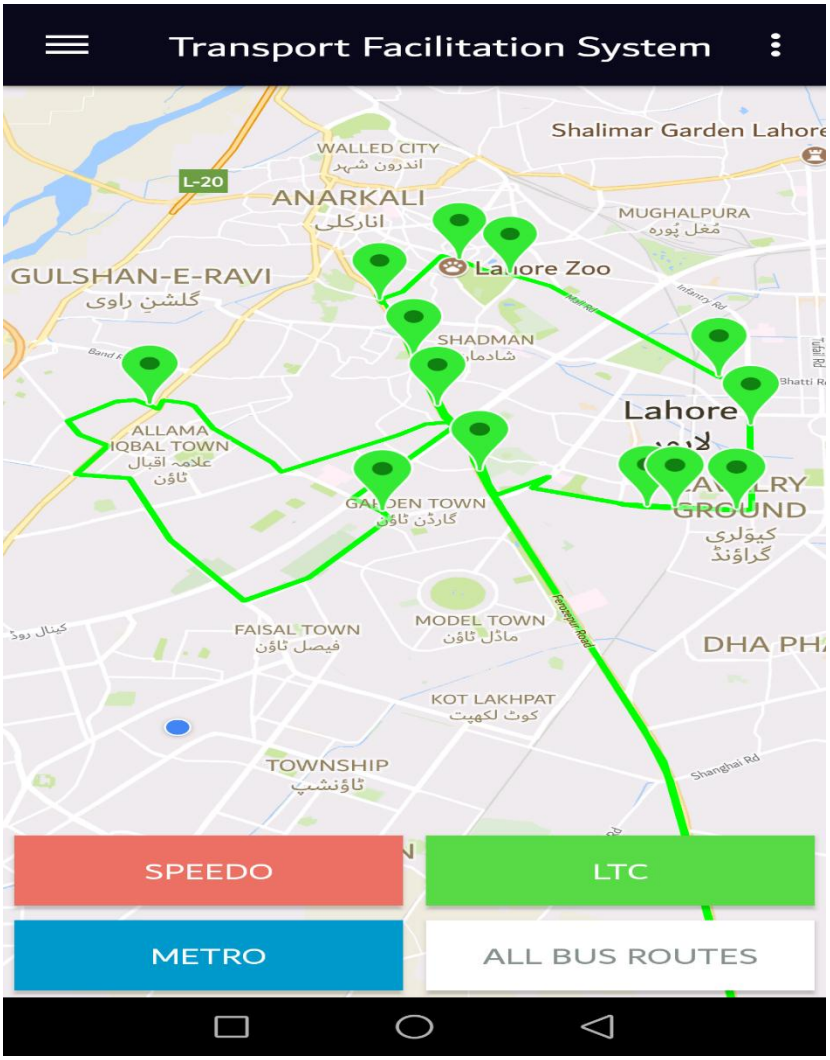


Figure 5-7 LTC

5.8 All Bus Routes

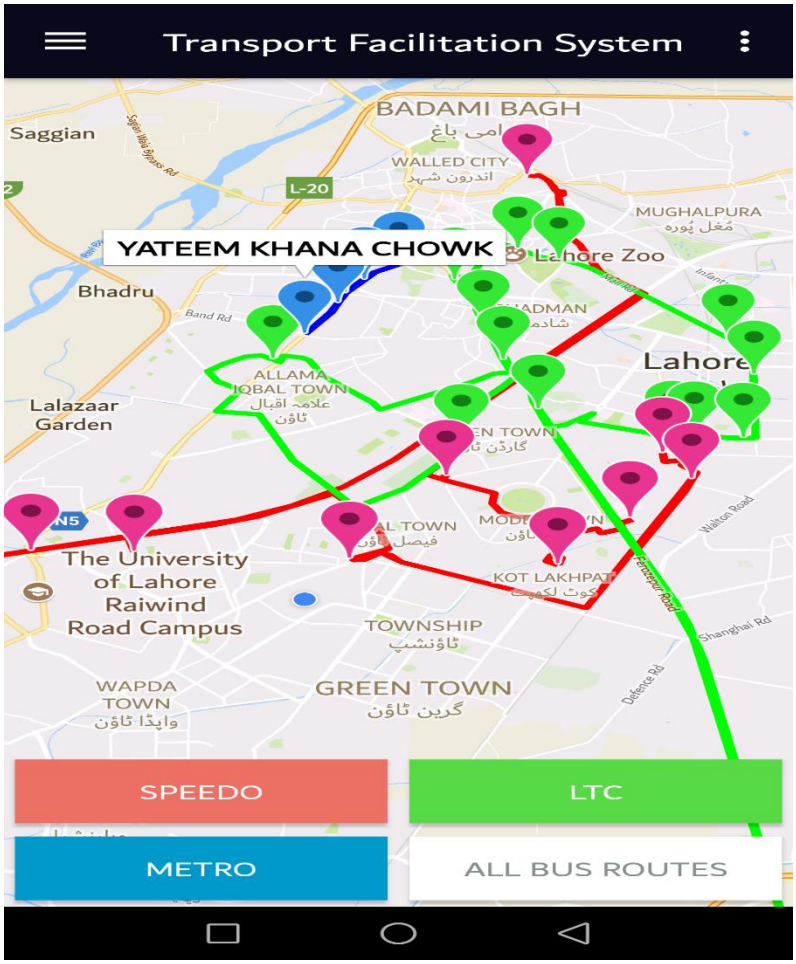


Figure 5-8 All Bus Routes

5.9 Route

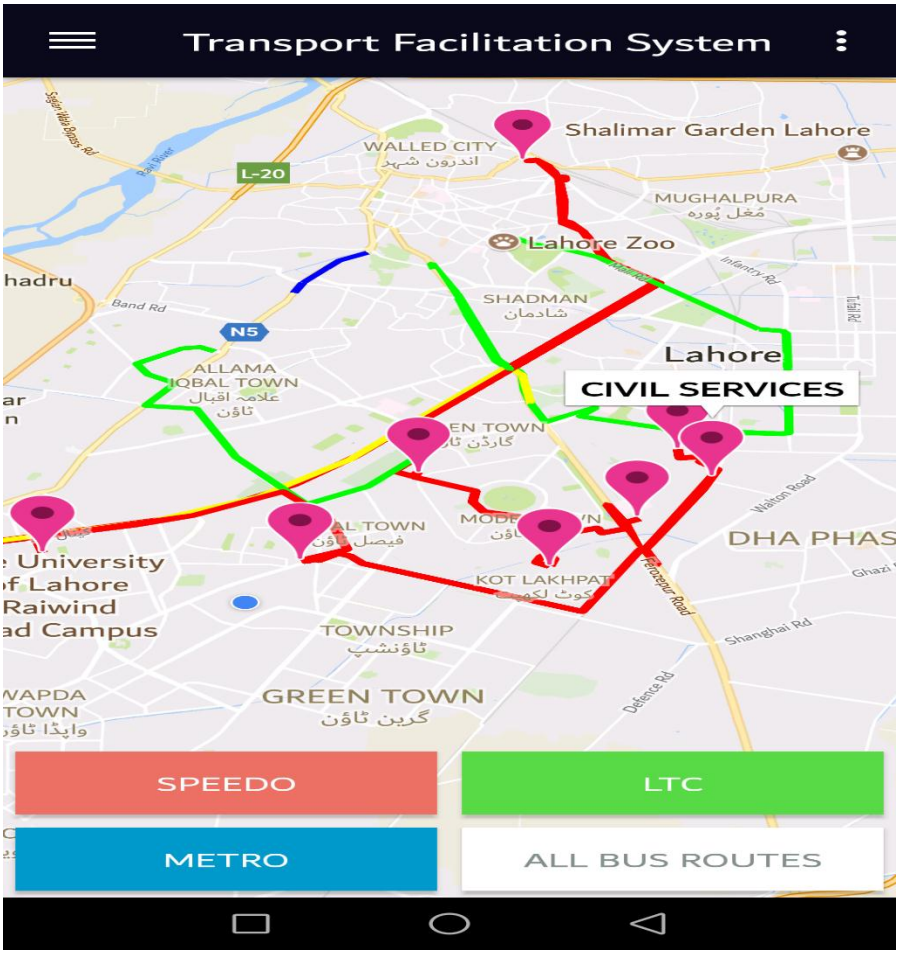


Figure 5-9 Route

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion:

The Transport Facilitation System focused on efficiency, security, and reliability for user. The objective is to provide the useful and efficient service to the users. A facilitation system about transportation will be delivered to the end users. A user-friendly system and helpful system for the users. The user will sign up the application for the first time. Later, when he needs to travel somewhere he will set his location through the pin, by using GPRS. The nearest bus stop will be visible to the user and the route of bus will also display on the application. So the user can know about the route and also how to reach the desired destination.

6.2 Recommendation:

In the above project we have covered on the government transport. But in future we can enhance our work by introducing the project in other cities and also its implementation on the private transports. Besides this we can also provide the facility of easy tickets on this application. Easy ticket will book the tickets while staying home.

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