

Bangladesh University of Engineering and Technology

CSE326: Information System Design Sessional

Project Title : Toll Management System

Section : B1

Group : 2

Group Members

Sourov Jajodia (1705072)

Kazi Wasif Amin (1705079)

Shafayet Hossain Mojumder (1705080)

Md. Kamrujjaman (1705081)

Md. Mehedi Hasan (1705082)

Asif Ahmed Utsa (1705084)

Date of submission

25 February, 2022

Content

1	Motivation	5
2	Introduction	5
2.1	Major Features	5
2.2	Modules & Submodules	6
2.3	Data Collection Process.....	6
2.4	Related Example	7
3	Requirement Analysis Using BPMN Diagram.....	8
3.1	Full Diagram	8
3.2	Control Point.....	9
3.2.1	Admin.....	9
3.3	User	10
3.3.1	Entry Point.....	11
3.3.2	Route Browse.....	11
3.3.3	Recharge.....	12
3.3.4	Reminder	12
3.4	Toll Entry Point	13
4	Class Diagrams.....	14
4.1	User Module	14
4.1.1	Profile Mnagement.....	14
4.1.2	Financial Management	14
4.1.3	Route Management	15
4.1.4	User History.....	15
4.2	Admin.....	16
4.2.1	Profile Management	16
4.2.2	Offer Management	17
4.2.3	Toll Booth Management	17
4.2.4	Gateway Management.....	18
4.2.5	Financial Management	18
4.3	Toll Booth	19
4.3.1	Cash Management.....	19
4.4	Full Diagram	20

5	ER Diagrams.....	21
6	Collaboration Diagrams	22
6.1	User	22
6.1.1	Profile Management	22
6.1.2	Financial Management	22
6.1.3	Route Management	23
6.1.4	User History.....	23
6.2	Admin.....	24
6.2.1	Profile Management	24
6.2.2	Offer Management	24
6.2.3	Toll Booth Management	25
6.2.4	Gateway Management.....	25
6.2.5	History.....	26
6.3	Toll Booth	26
6.3.1	Finance Management	26
7	Sequence Diagrams	27
7.1	User	27
7.1.1	Profile Management	27
7.1.2	Financial Management	27
7.1.3	Route Management	28
7.1.4	User History.....	28
7.2	Admin.....	29
7.2.1	Profile Management	29
7.2.2	Offer Management	29
7.2.3	Toll Booth Management	30
7.2.4	Gateway Management.....	30
7.2.5	History.....	31
7.3	Toll Booth	31
7.3.1	Finance Management	31
8	Mock UI.....	32
8.1	User Module	32
8.1.1	Login & Signup.....	32
8.1.2	Homepage	32

8.1.3	Browsing Route	33
8.1.4	Recharge.....	34
8.1.5	Due Payment.....	35
8.1.6	Edit Profile	35
8.2	Admin.....	36
8.2.1	Login & Forgot Password	36
8.2.2	Homepage	38
8.2.3	Add Toll Booth.....	38
8.2.4	Toll List.....	39
8.2.5	Payment List	39
8.2.6	Dues List	40
9	Snippets of Implemented Module	41
9.1	Login & Signup.....	41
9.2	Homepage.....	42
9.3	Recharge.....	42
9.4	Route browsing.....	43
9.5	Dues History.....	44
10	Major Feedback	45
10.1	Major Feedback on BPMN Diagram.....	45
10.2	Mock UI	45

1 Motivation

A Toll Road is a public or private road for which a fee or toll is assessed for passage. Moreover a Toll Booth is basically a counter by which tolls are collected. In our country, tolls are collected manually by toll booth. It has some disadvantages. Such that:

- Manual Processing
- Time Consuming
- Human Effortful
- Inefficient
- Heavy Traffic Occurrence

But we have brought a new idea which can remove all of those problems. And this is an automatic toll collection system named **Toll Management System**.



2 Introduction

There are two parts in this system. One is software and another is hardware. Basically we have designed only software part here.

2.1 Major Features

Major Features of this system are listed below:

- Dedicated payment system
- Number plate scanning
- Toll booth location browsing
- Toll missing reminder
- Fake number plate tracking
- Refund system
- Special offers

2.2 Modules & Submodules

Browsing Map

- Select a route
- See toll booths
- Pre-paid facilities

Payment System

- Registration
- User profile
- Recharge
- Payment

Number Plate Scanning

- Number plate scanning
- Number plate validation
- Tracking false number plate and inform to police

Other features

- Reminder if a toll payment missed
- Refund toll amount after certain time period
- Special bundle offer for pre-paid users

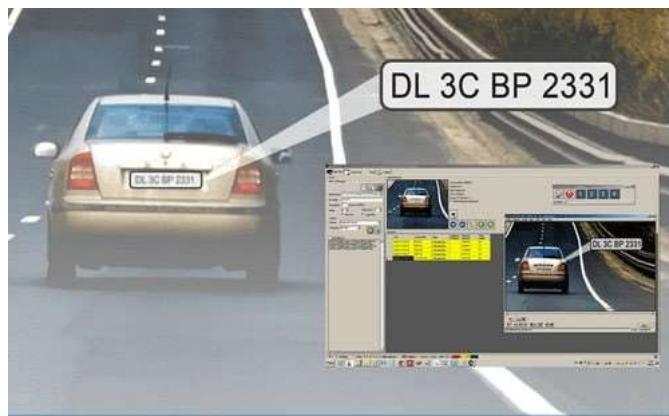
2.3 Data Collection Process

BRTA

Retrieve vehicle registration no and the owner information from BRTA

Scanner

Scan vehicle no while passing through toll booth.

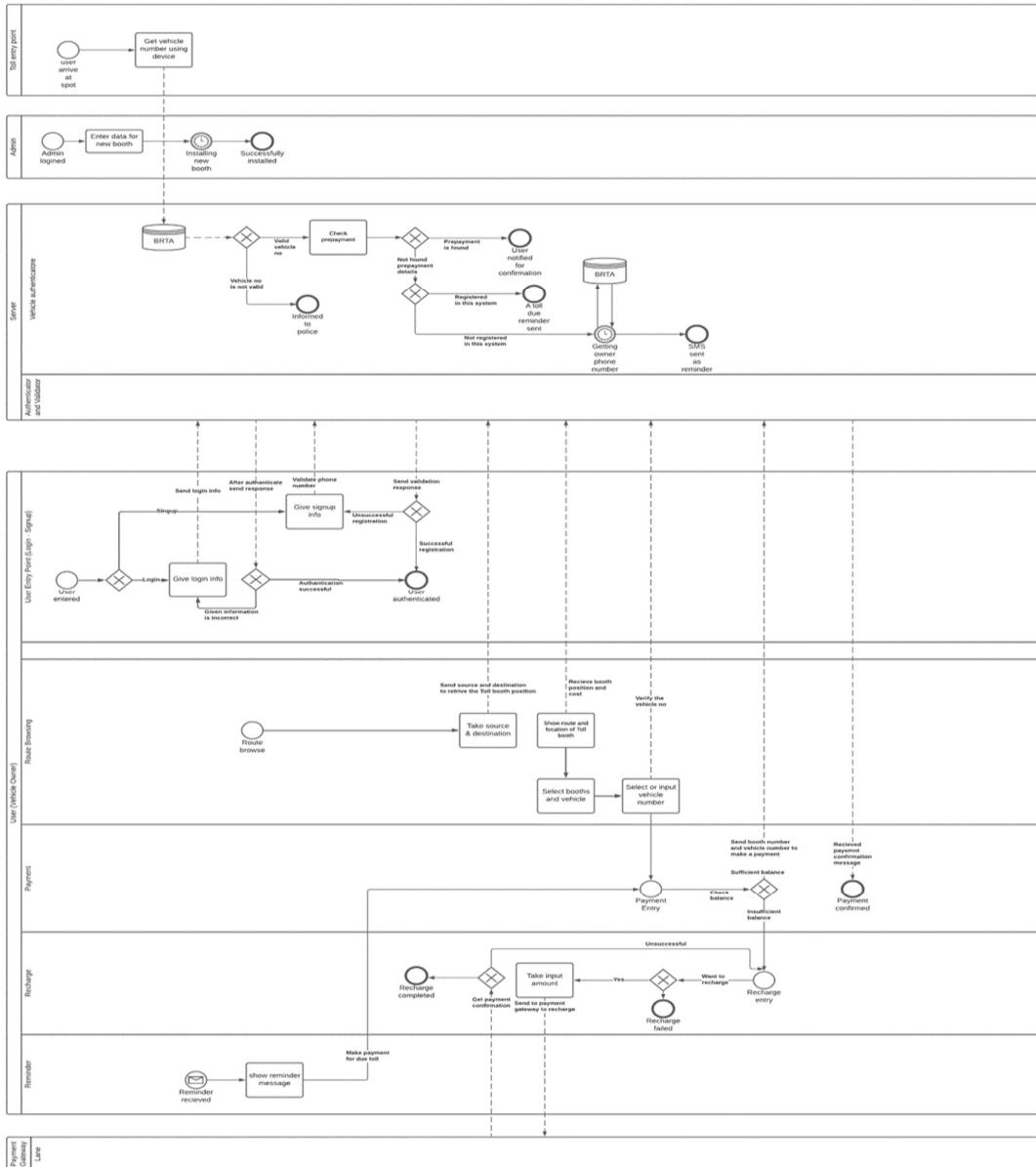


2.4 Related Example

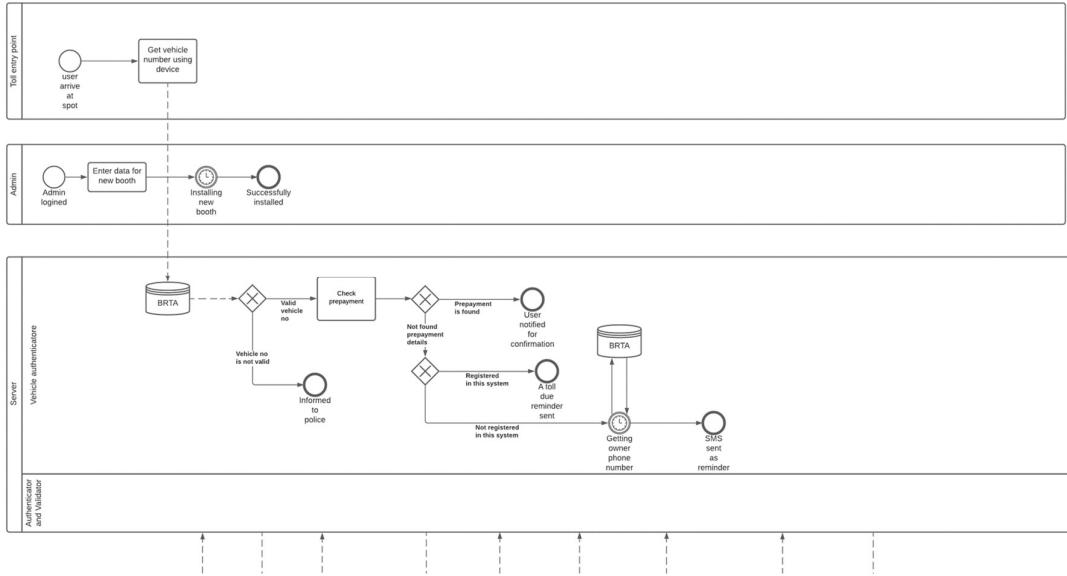
Similar kind of concepts can be seen in many other countries like Japan, China, USA etc.
In Bangladesh, **this is totally a new concept.**

3 Requirement Analysis Using BPMN Diagram

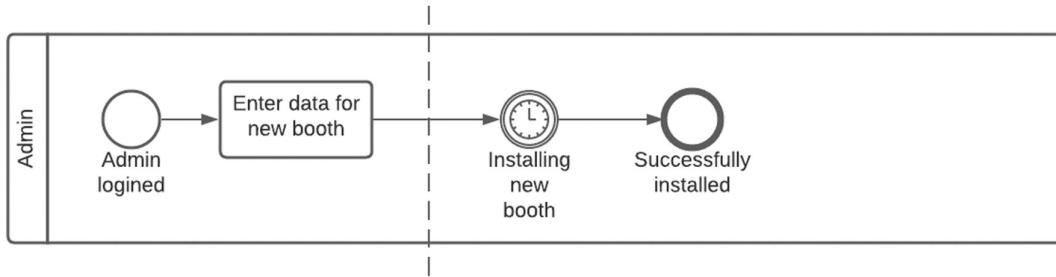
3.1 Full Diagram



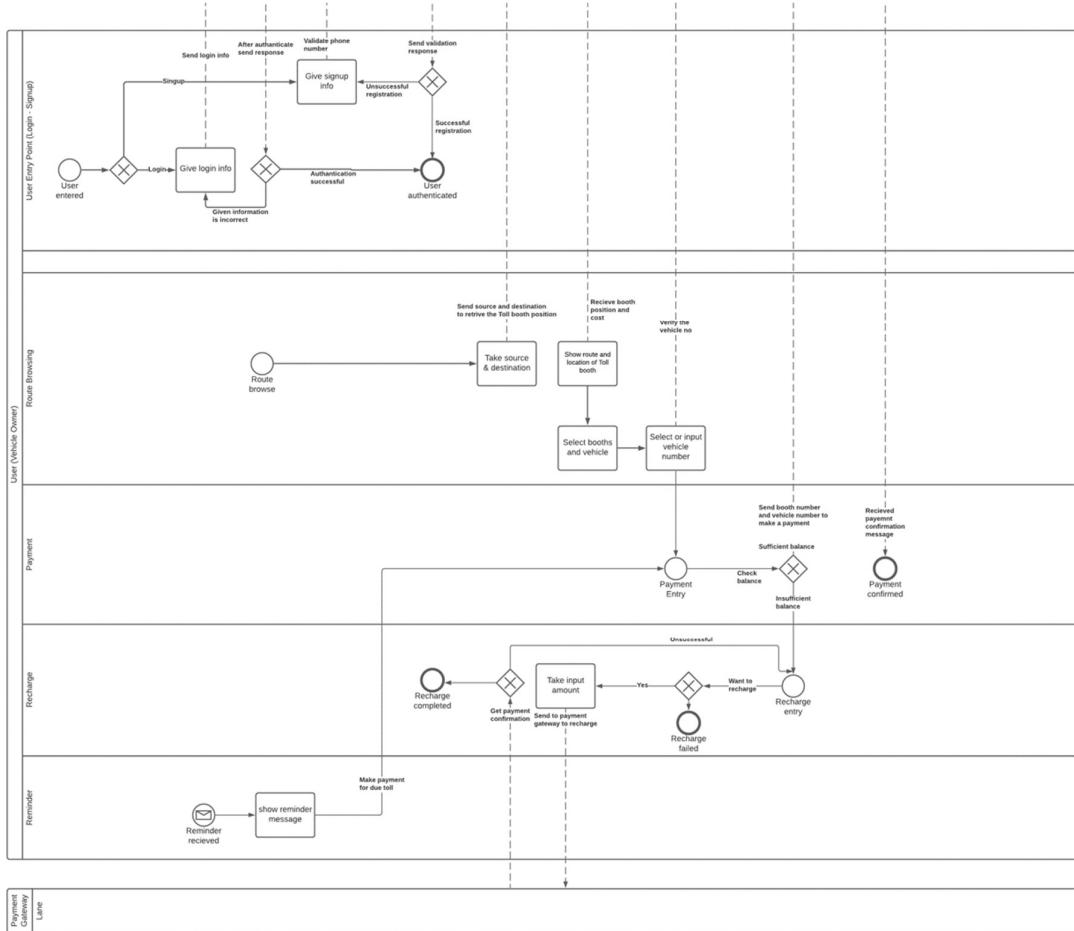
3.2 Control Point



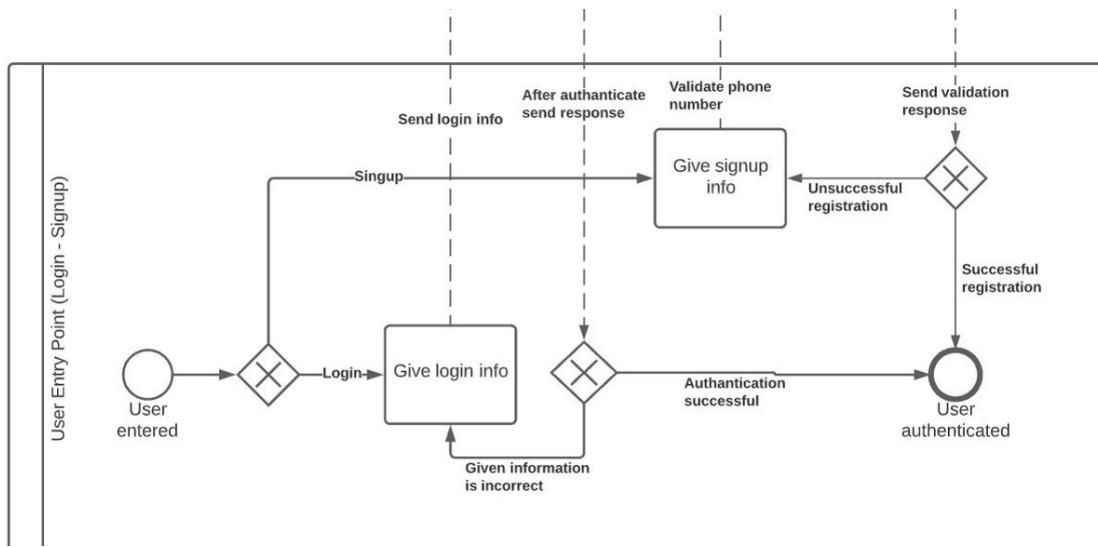
3.2.1 Admin



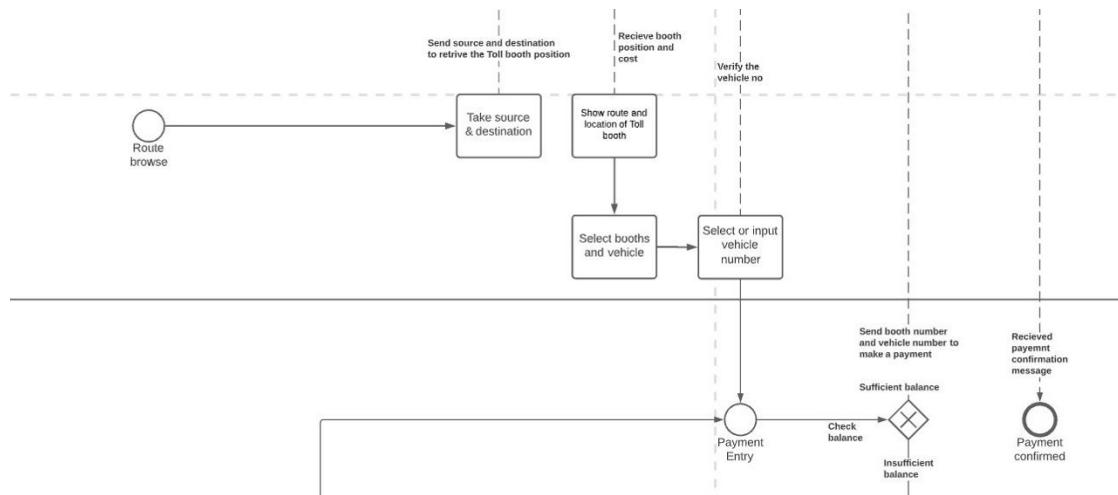
3.3 User



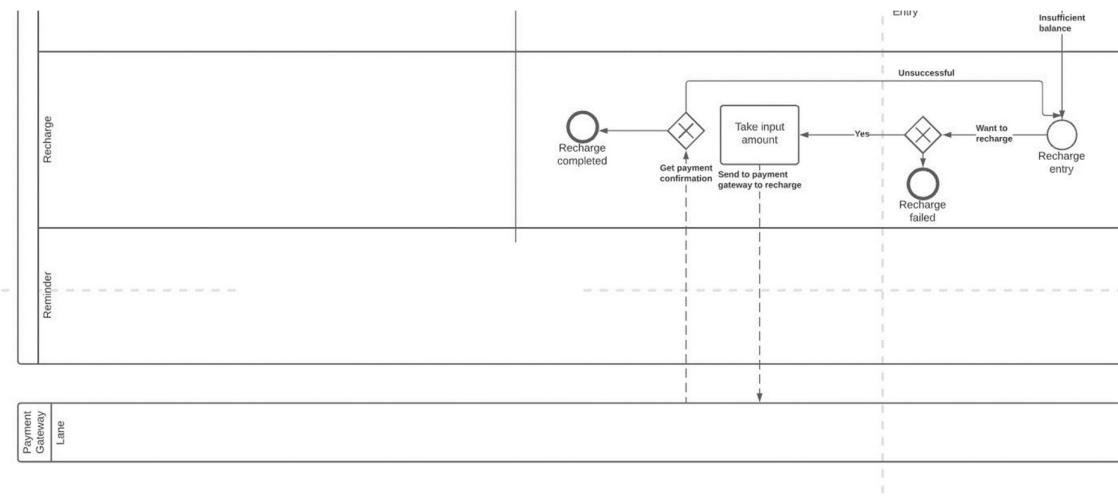
3.3.1 Entry Point



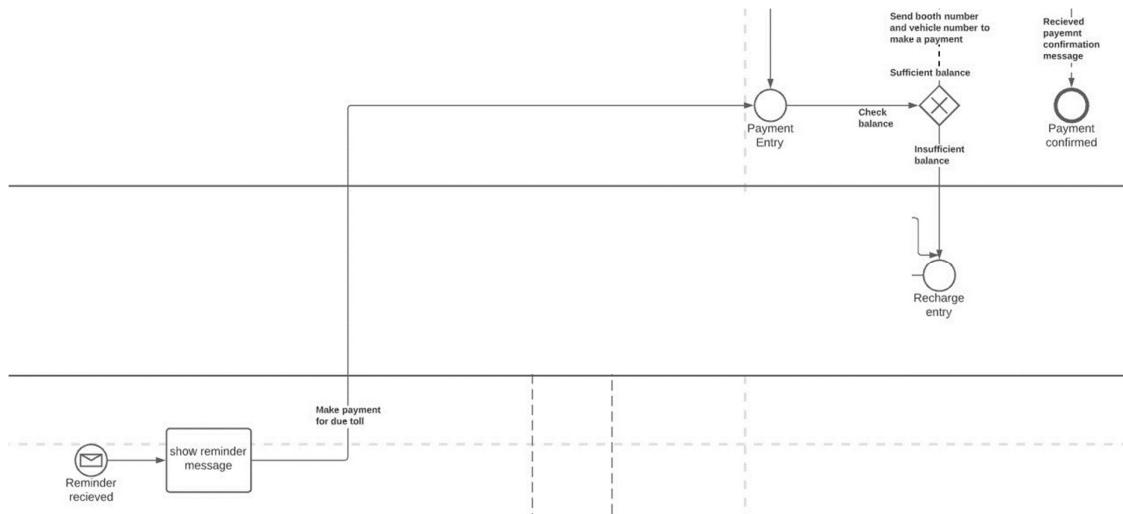
3.3.2 Route Browse



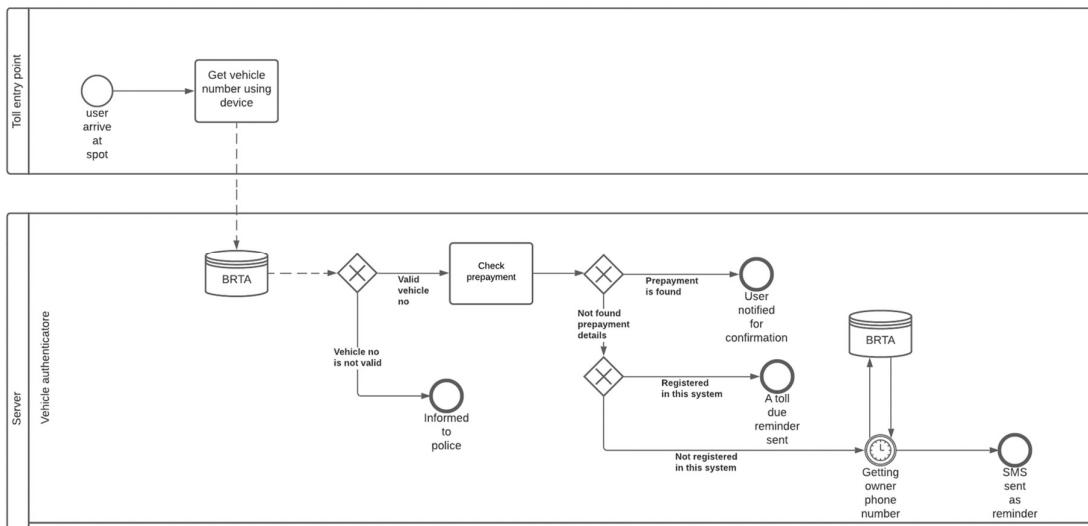
3.3.3 Recharge



3.3.4 Reminder



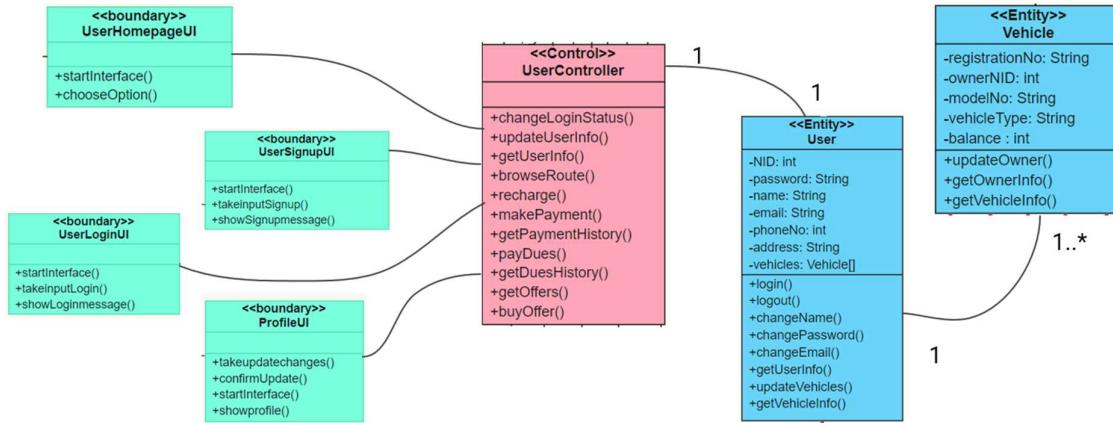
3.4 Toll Entry Point



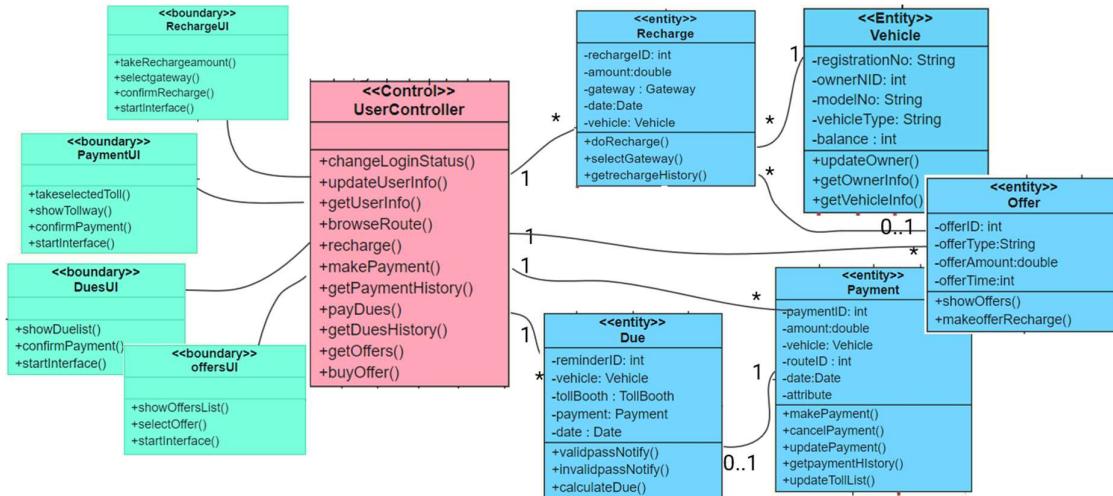
4 Class Diagrams

4.1 User Module

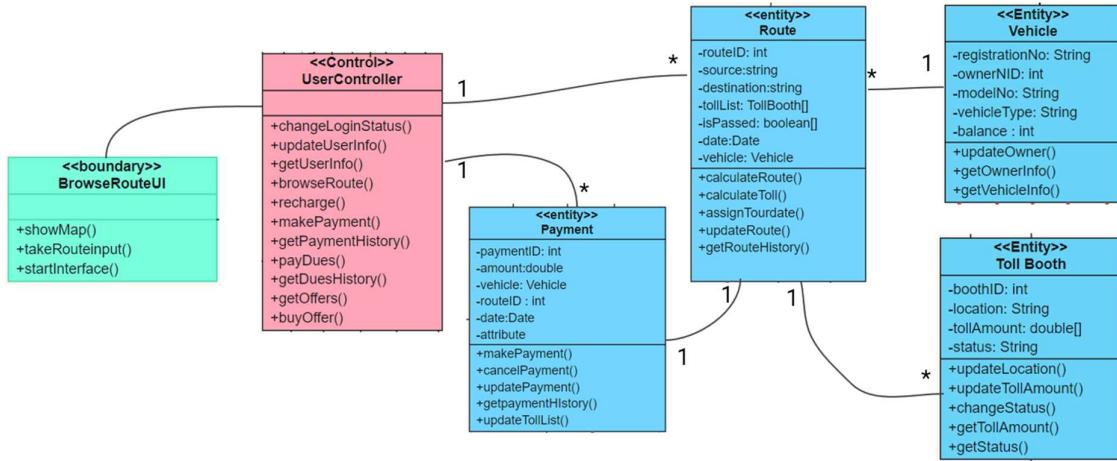
4.1.1 Profile Management



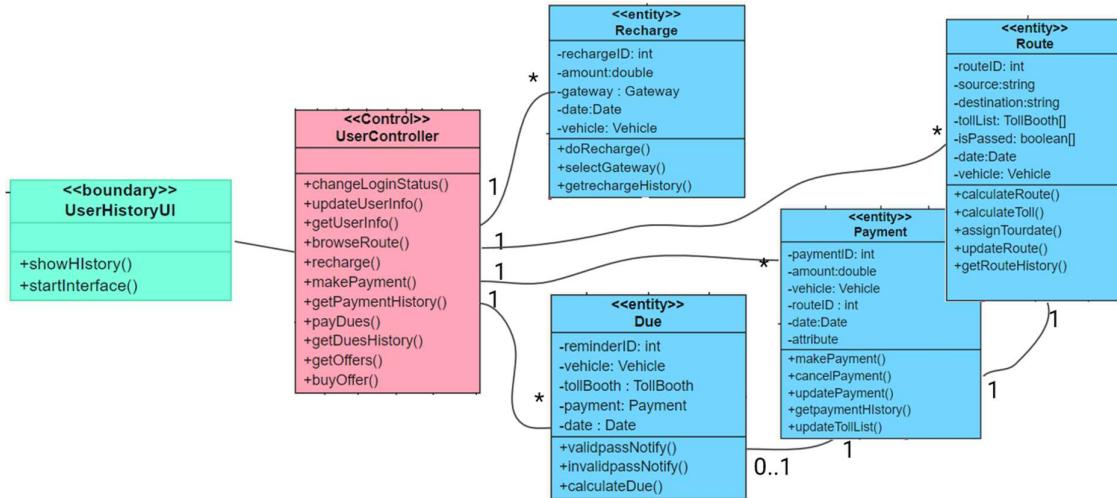
4.1.2 Financial Management



4.1.3 Route Management

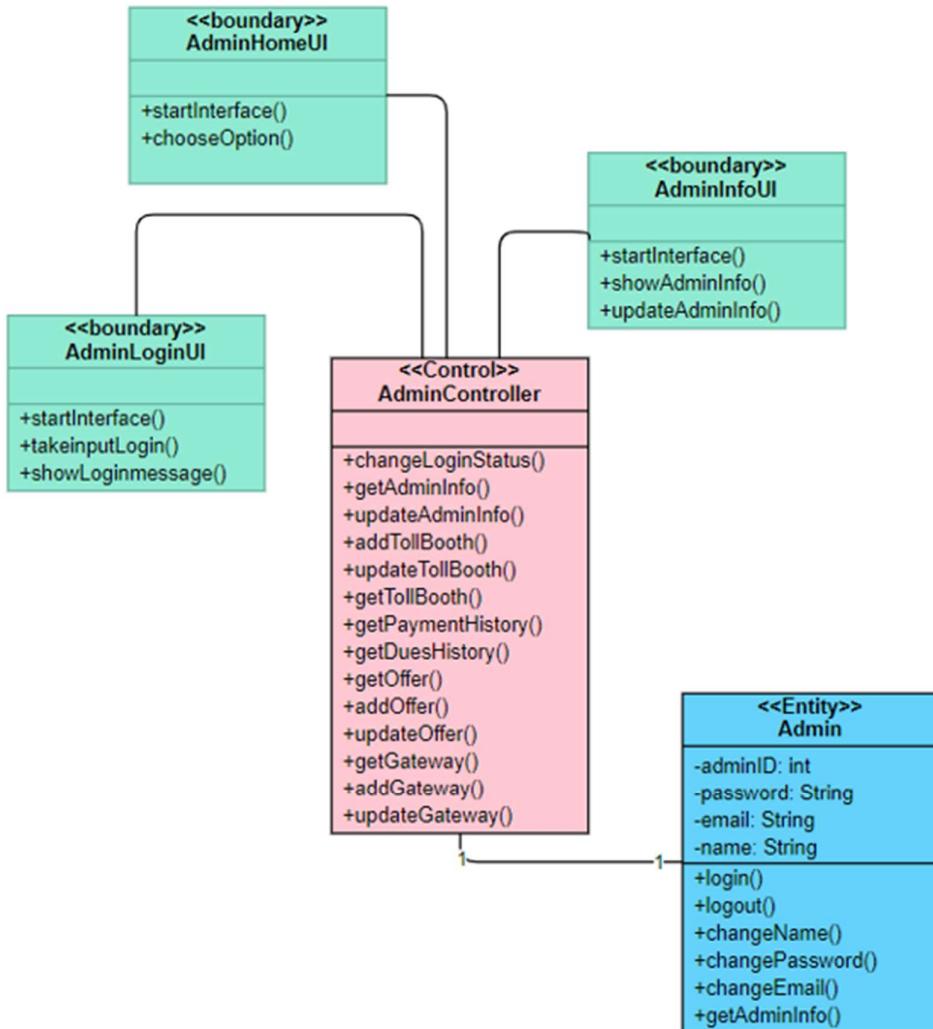


4.1.4 User History

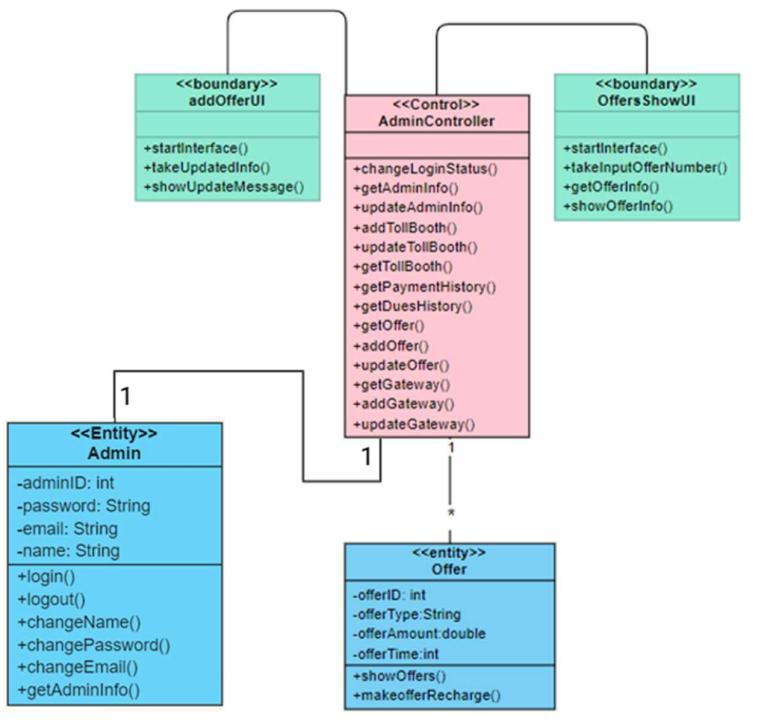


4.2 Admin

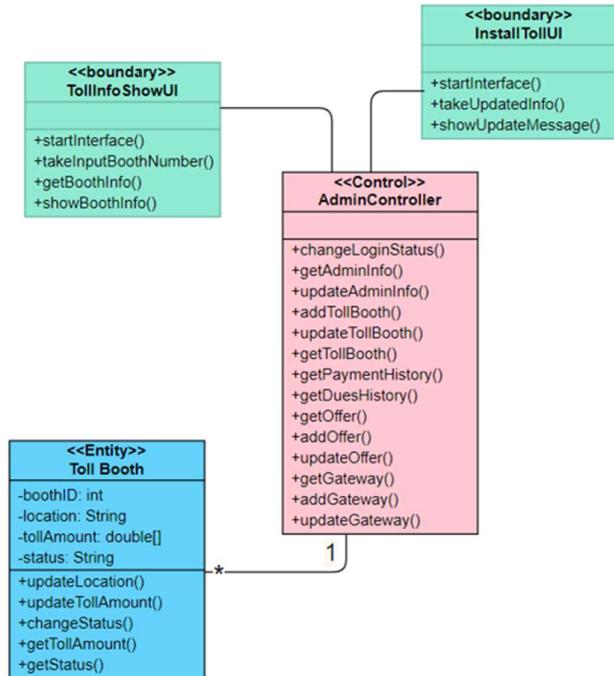
4.2.1 Profile Management



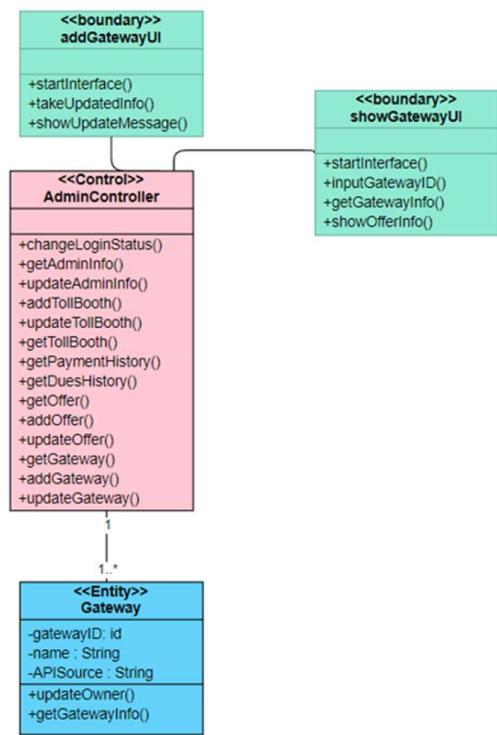
4.2.2 Offer Management



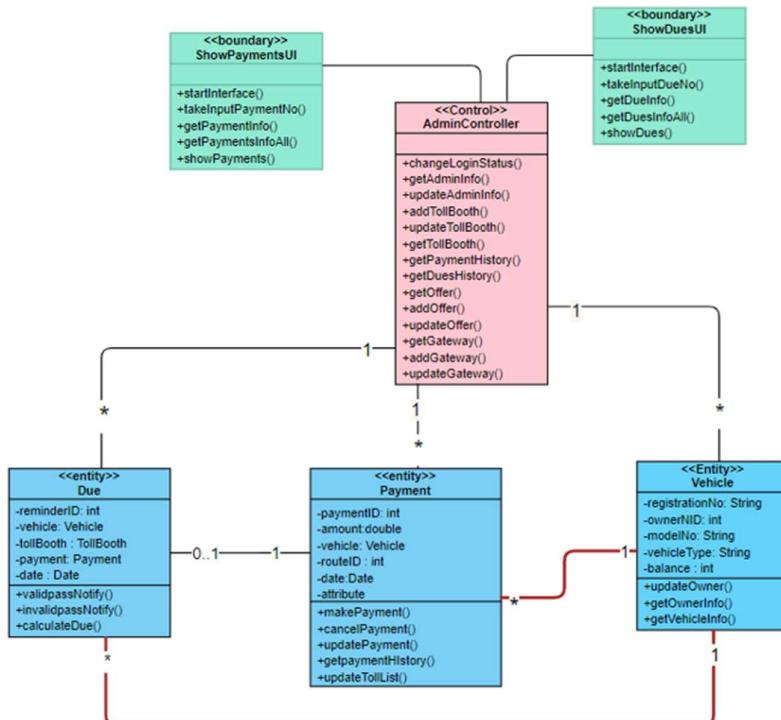
4.2.3 Toll Booth Management



4.2.4 Gateway Management

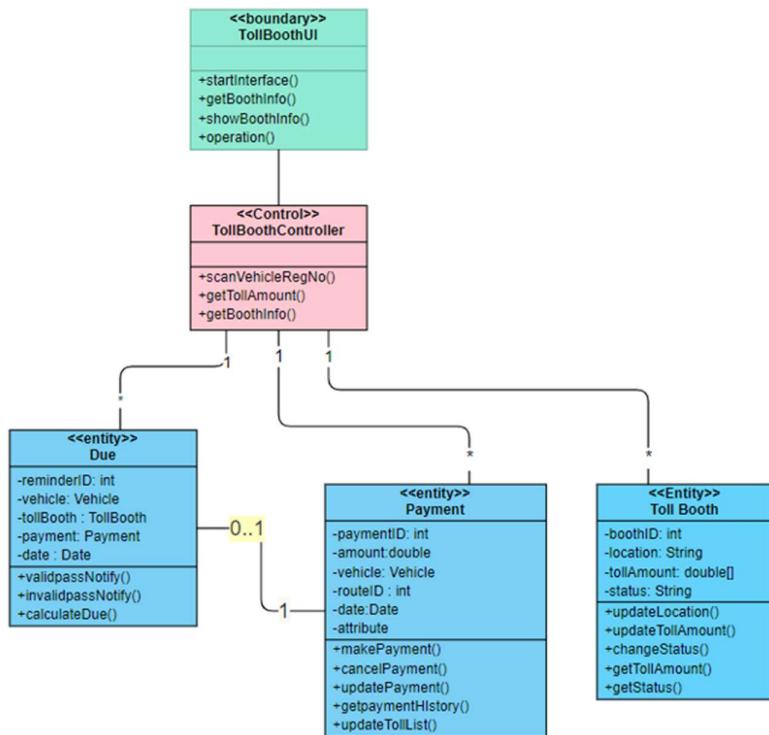


4.2.5 Financial Management

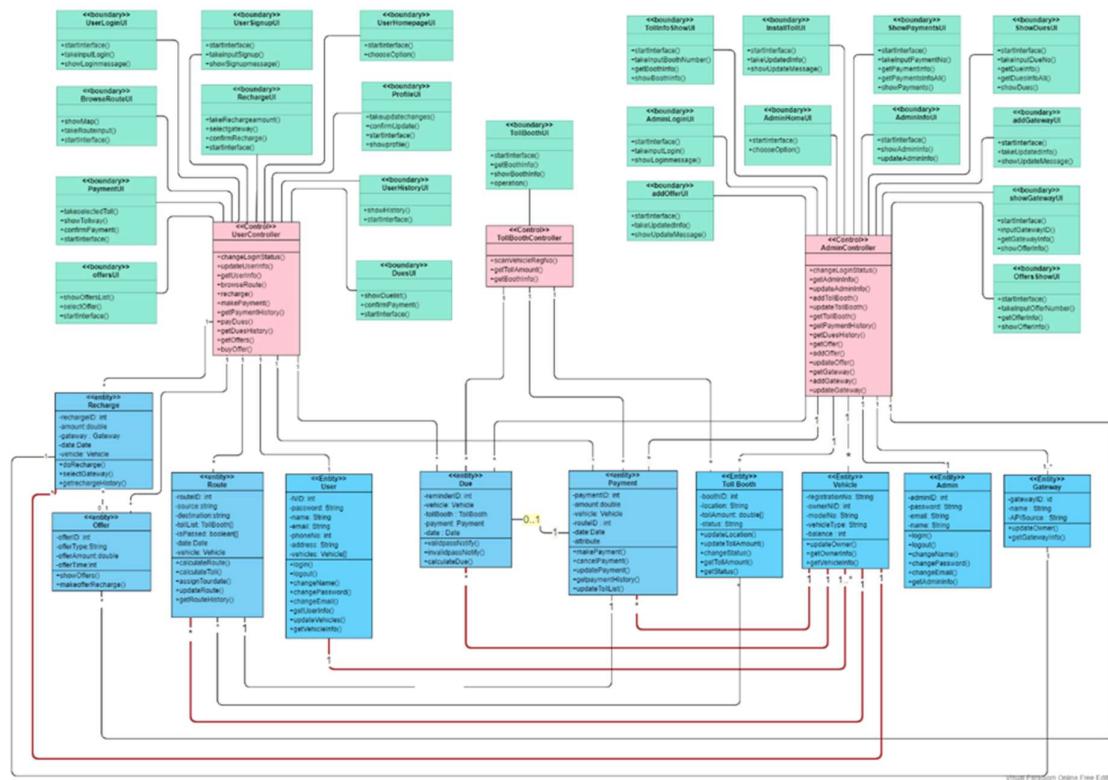


4.3 Toll Booth

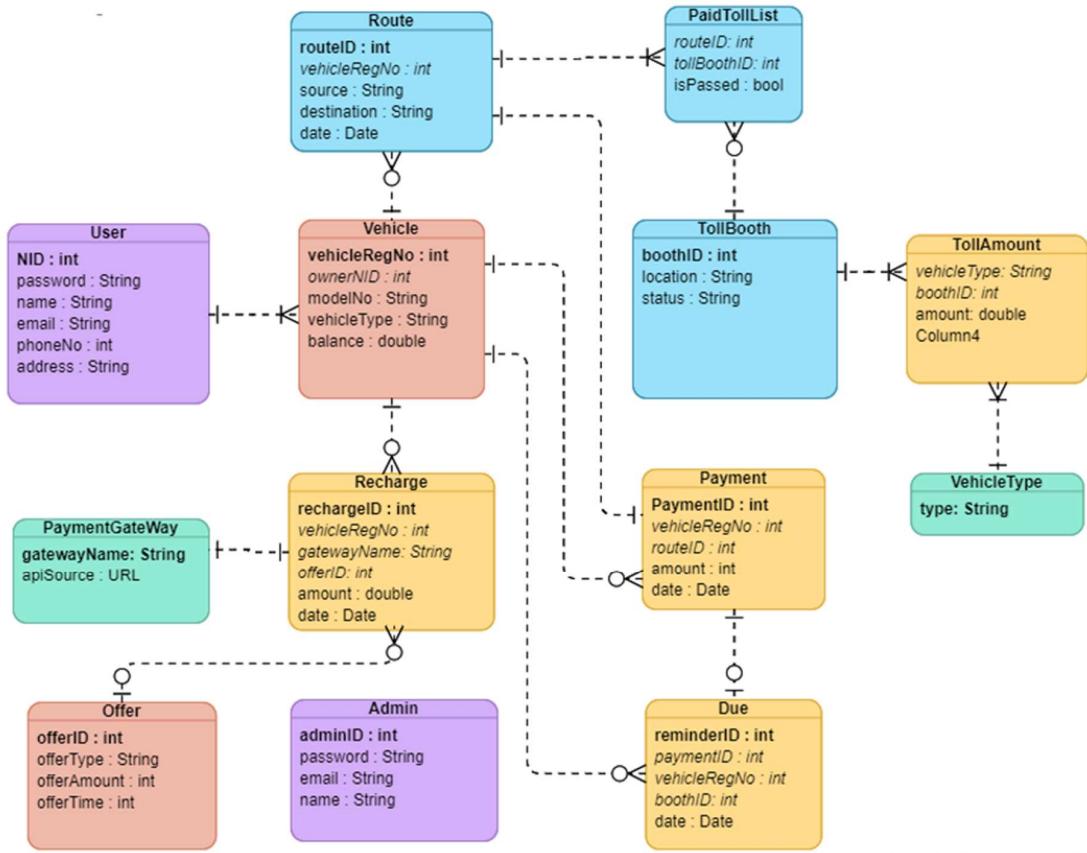
4.3.1 Cash Management



4.4 Full Diagram



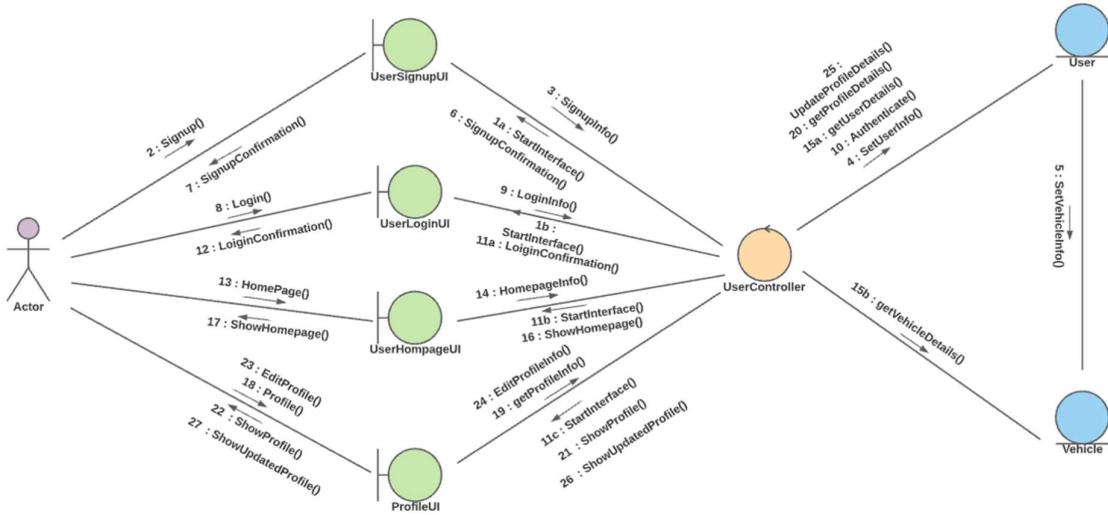
5 ER Diagrams



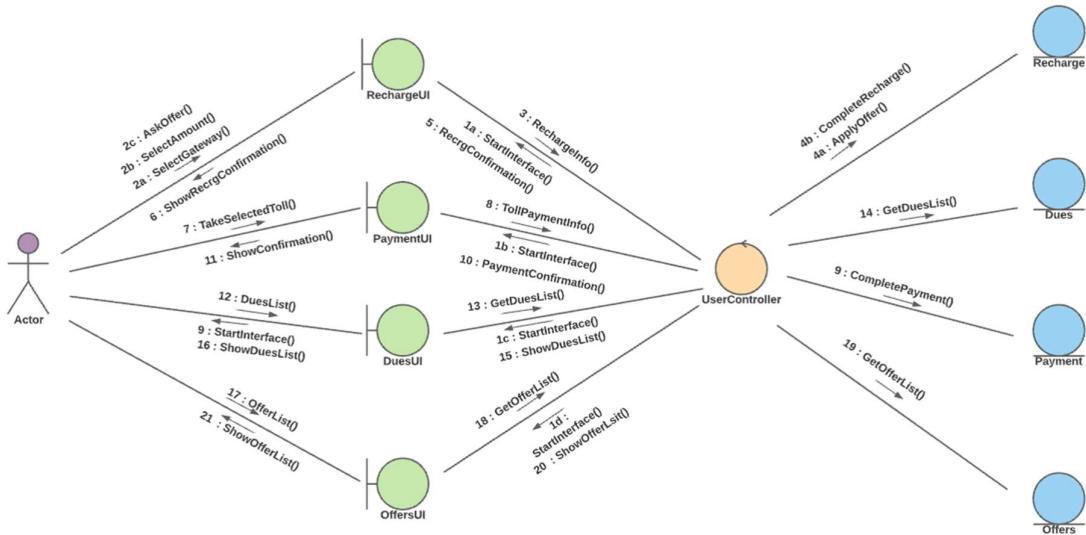
6 Collaboration Diagrams

6.1 User

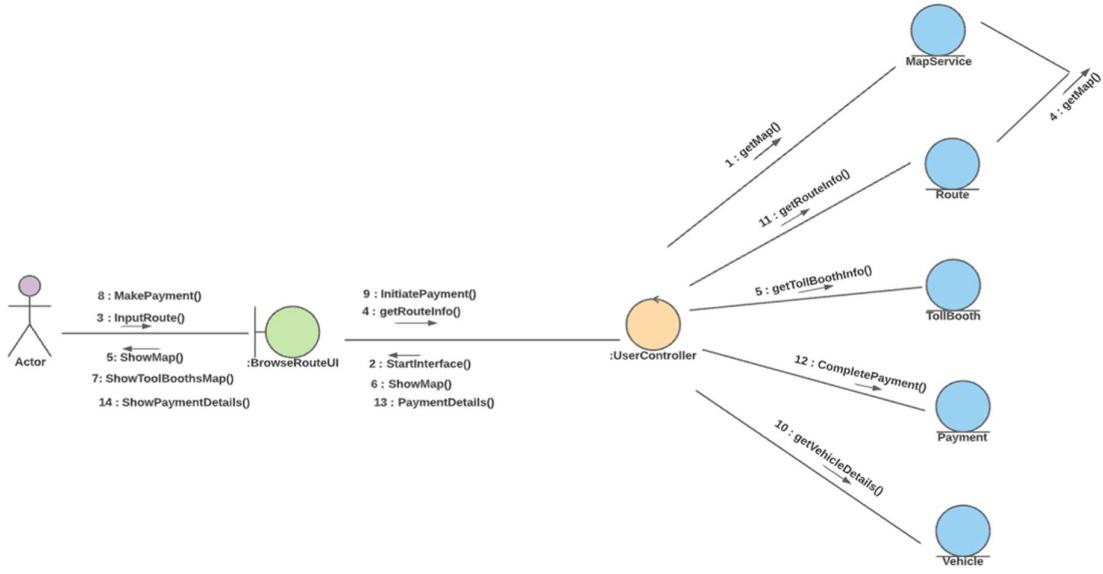
6.1.1 Profile Management



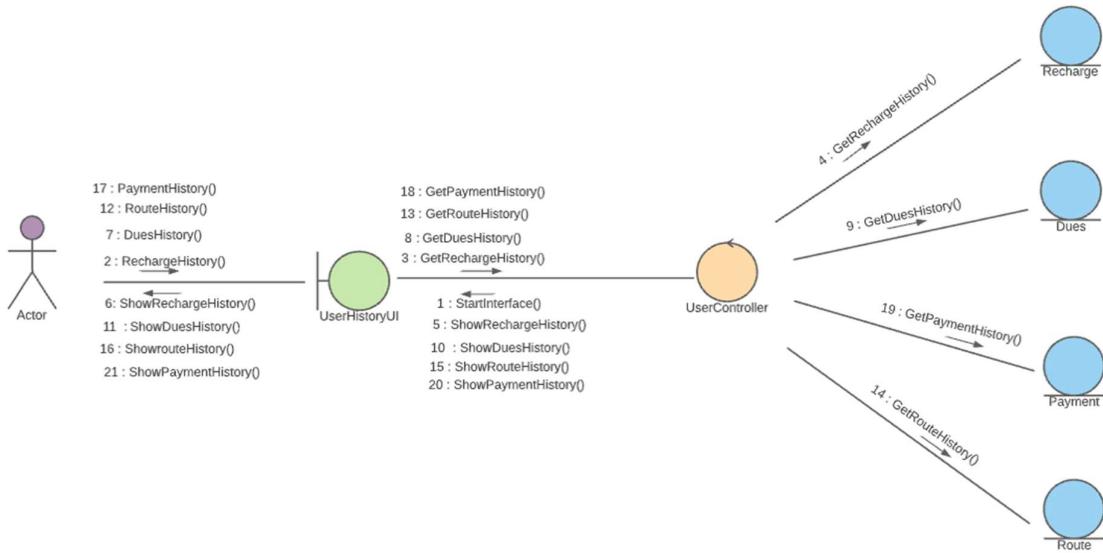
6.1.2 Financial Management



6.1.3 Route Management

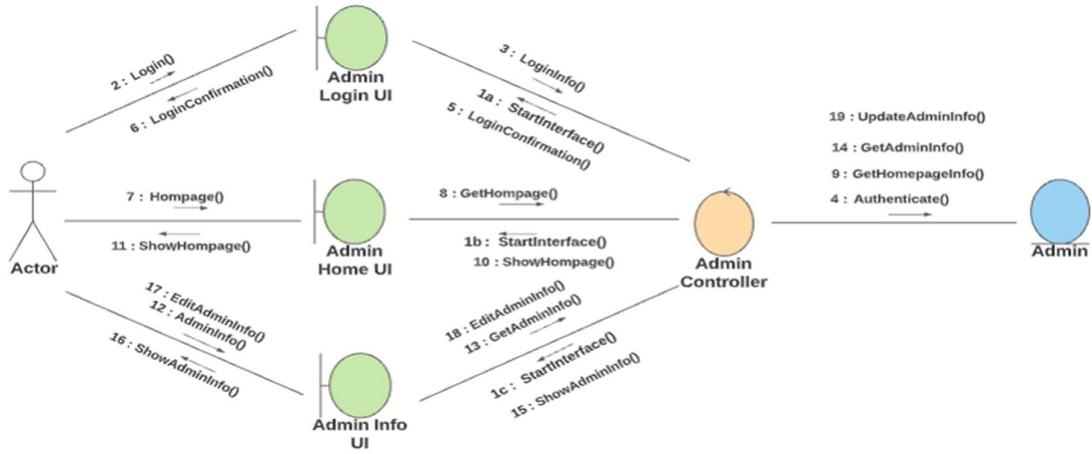


6.1.4 User History

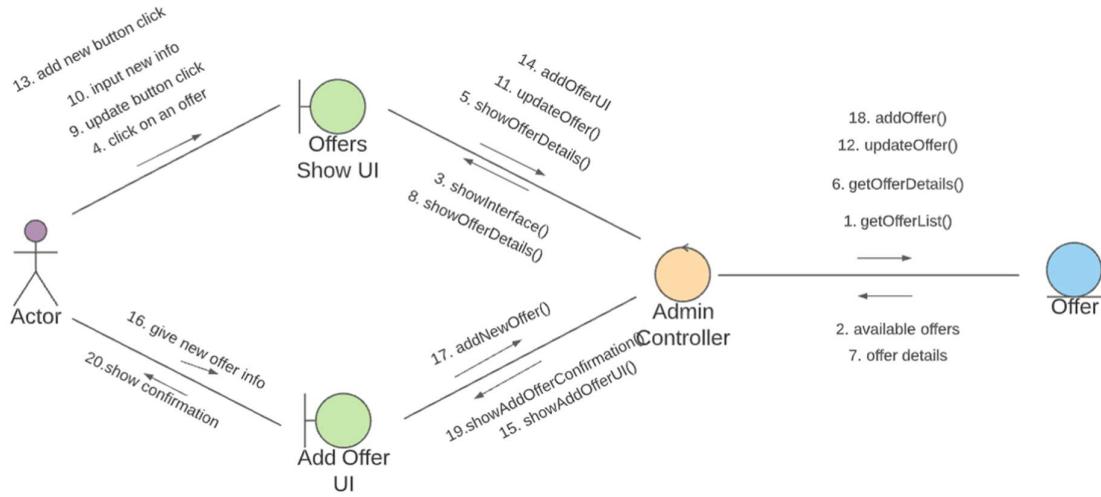


6.2 Admin

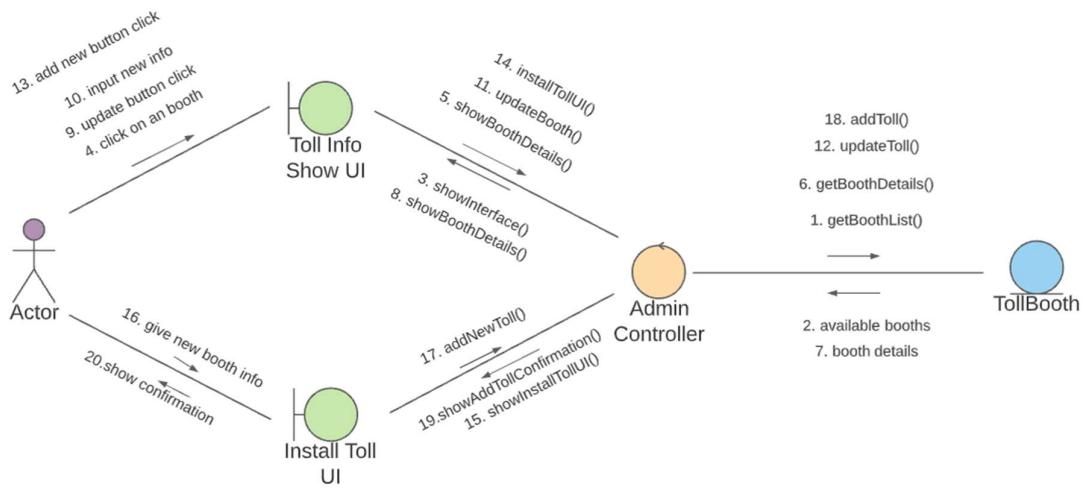
6.2.1 Profile Management



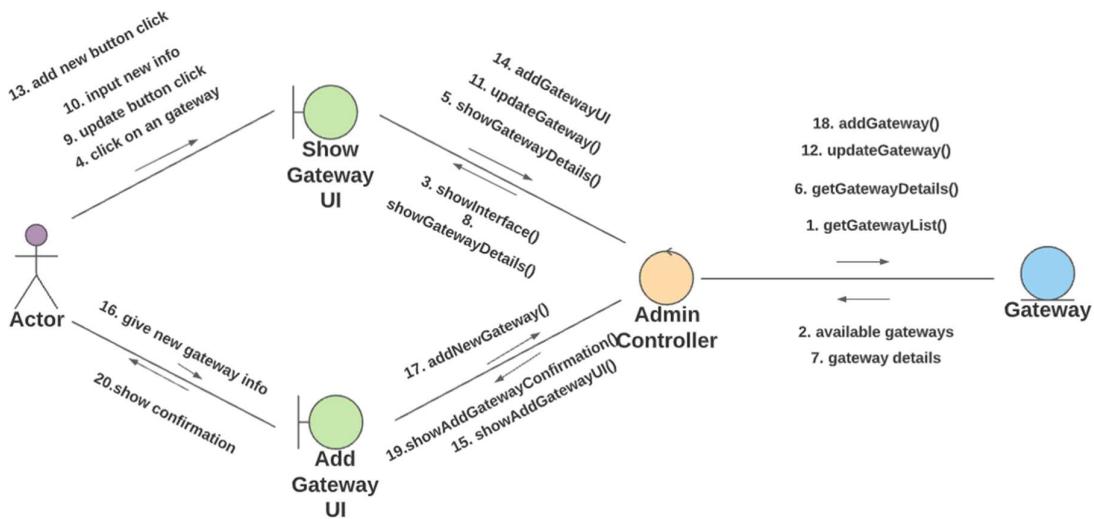
6.2.2 Offer Management



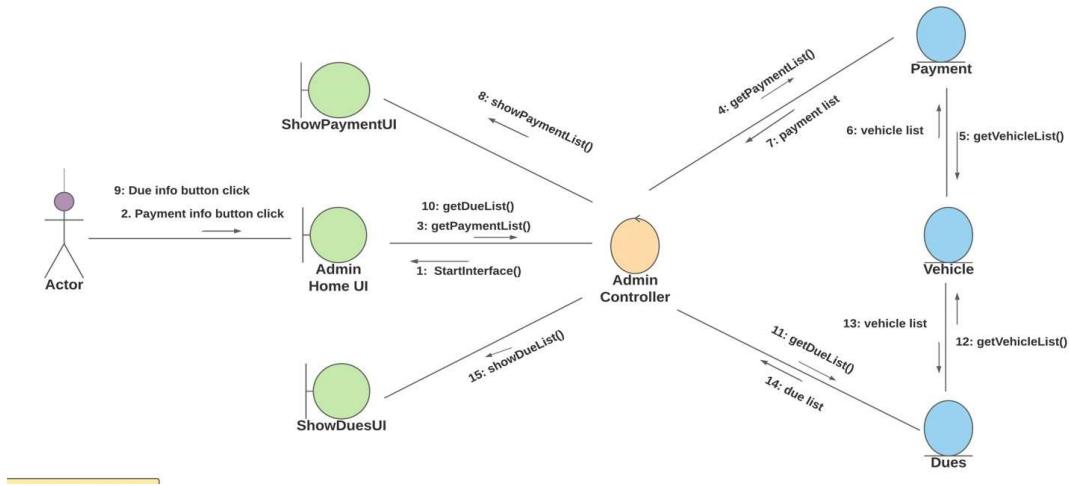
6.2.3 Toll Booth Management



6.2.4 Gateway Management

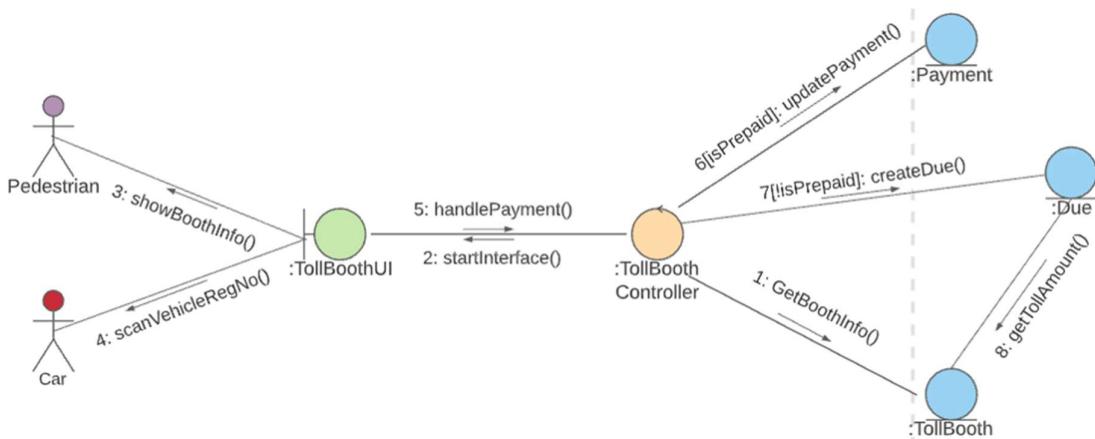


6.2.5 History



6.3 Toll Booth

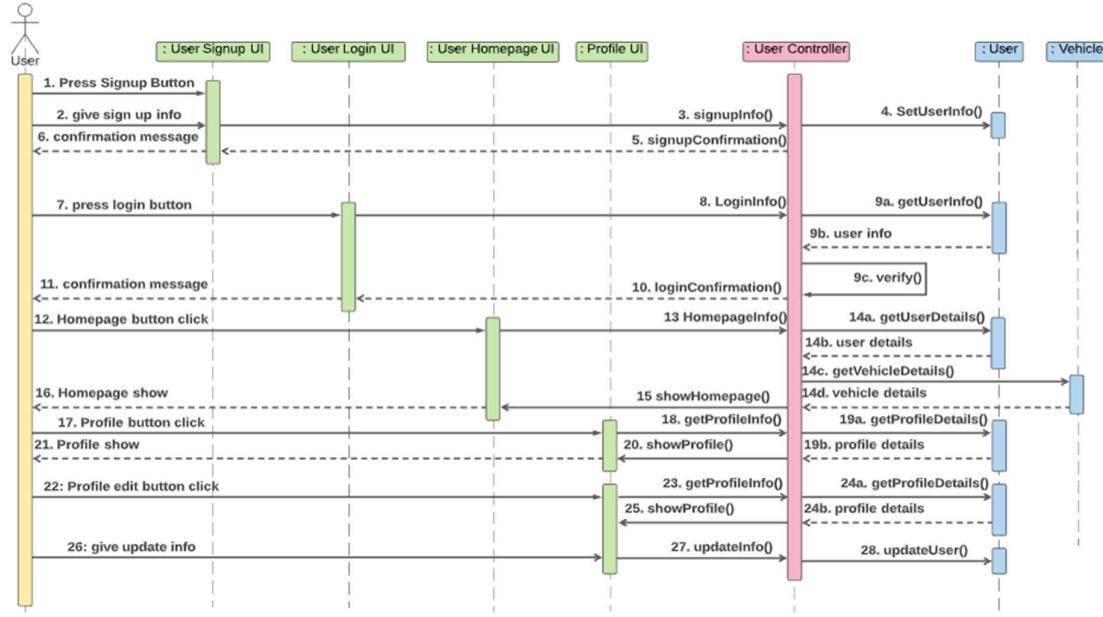
6.3.1 Finance Management



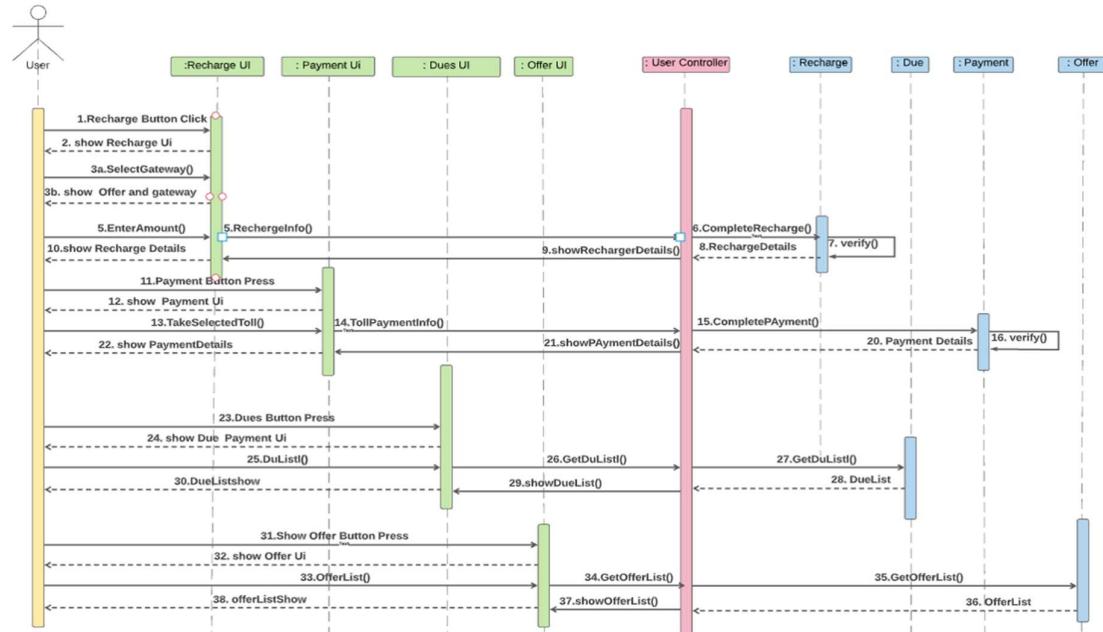
7 Sequence Diagrams

7.1 User

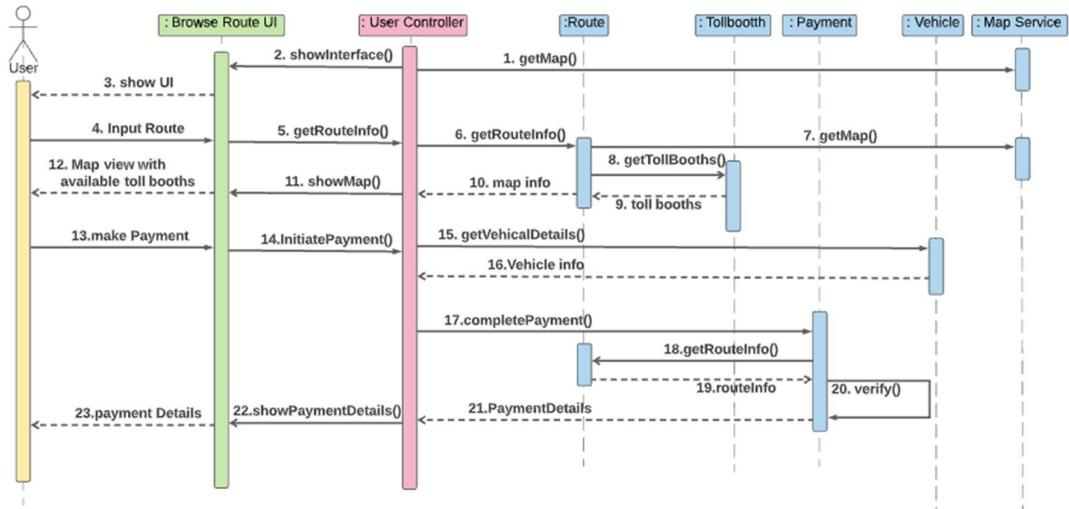
7.1.1 Profile Management



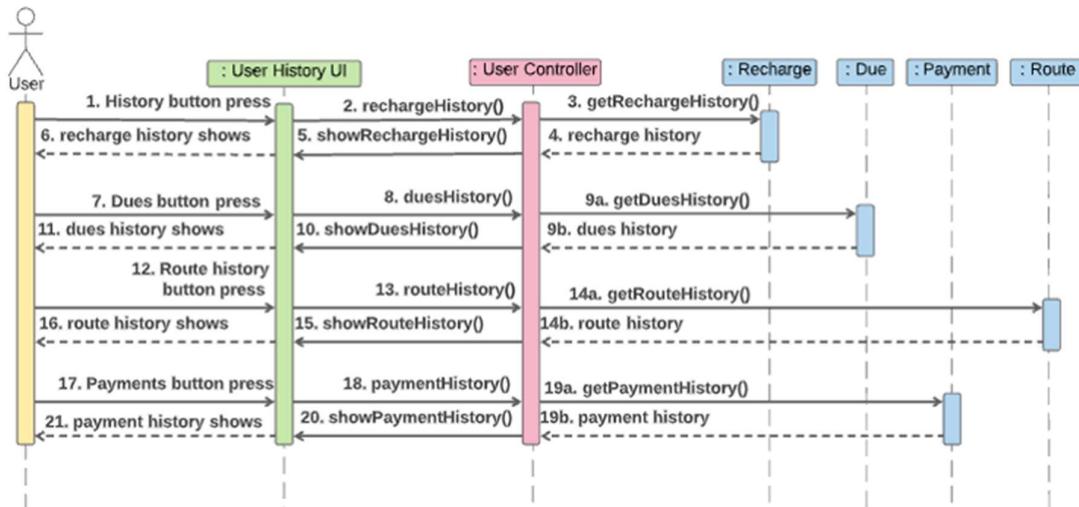
7.1.2 Financial Management



7.1.3 Route Management

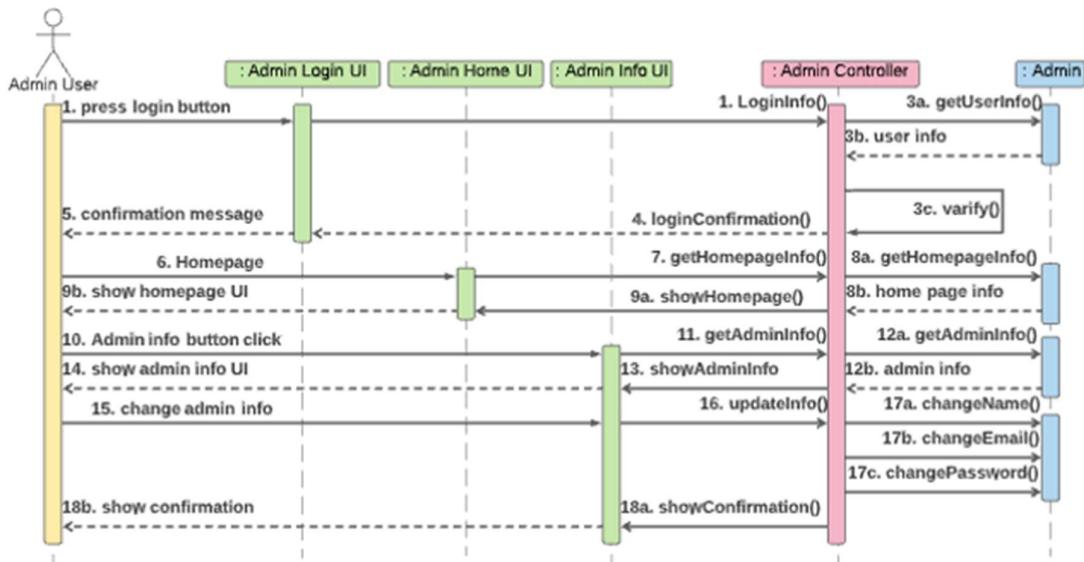


7.1.4 User History

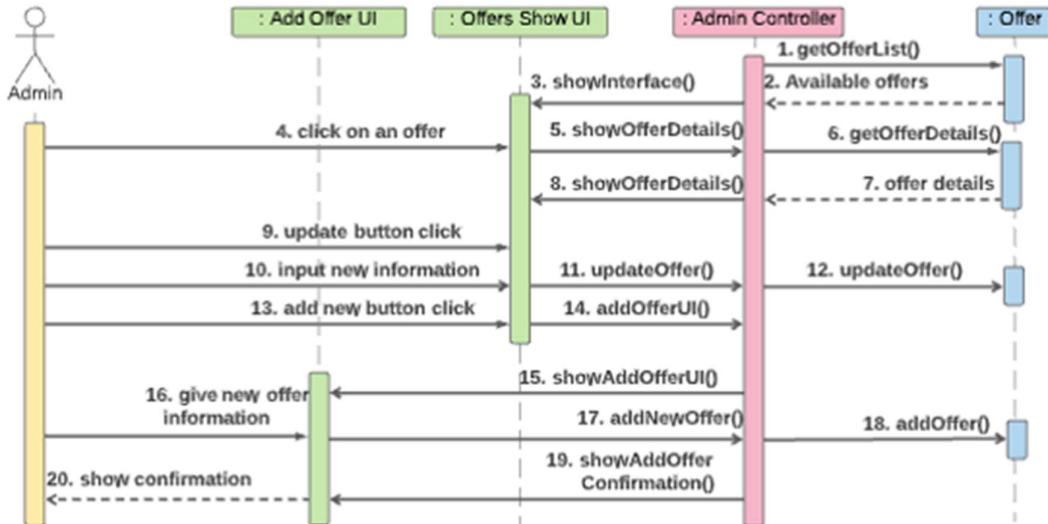


7.2 Admin

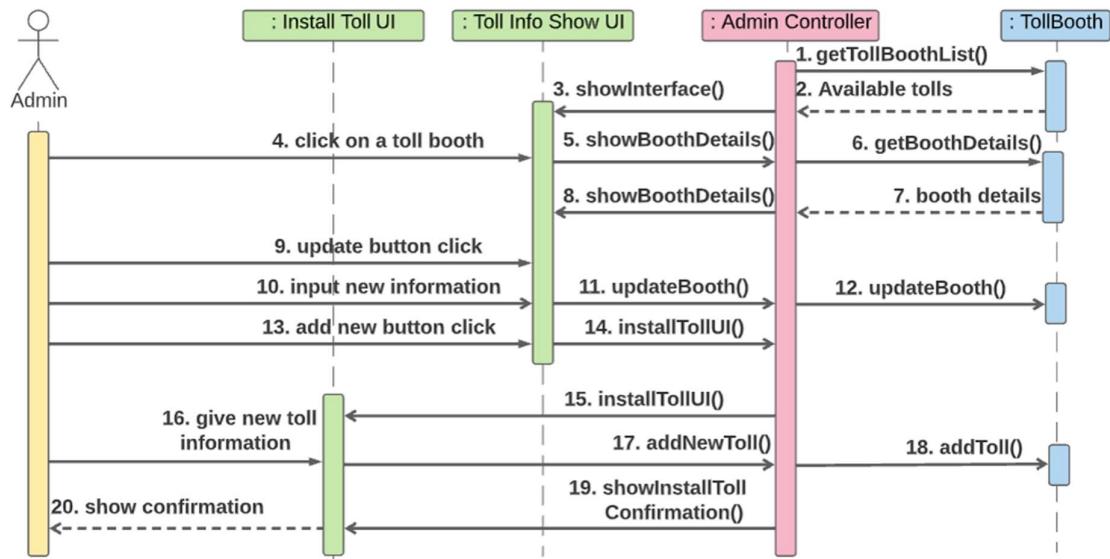
7.2.1 Profile Management



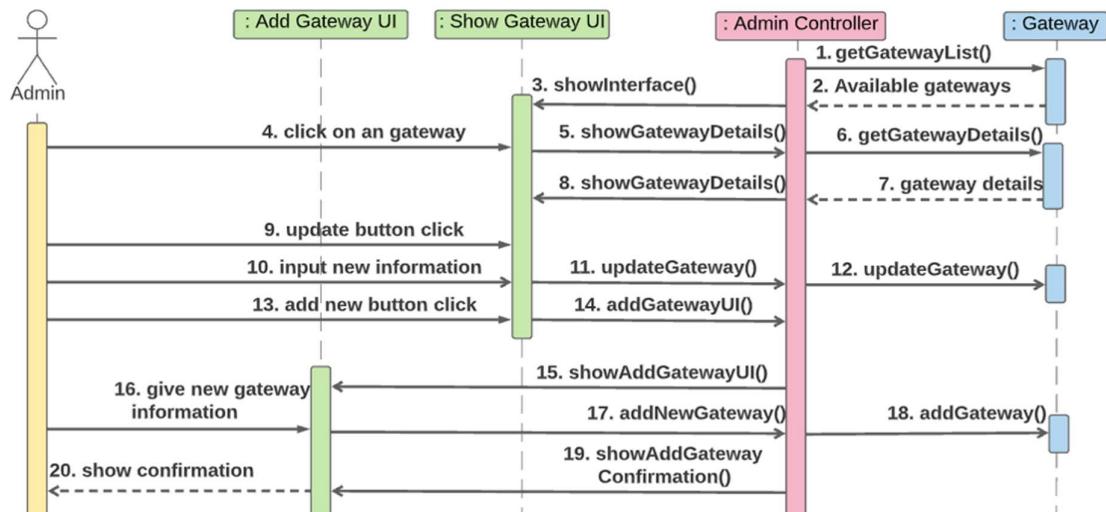
7.2.2 Offer Management



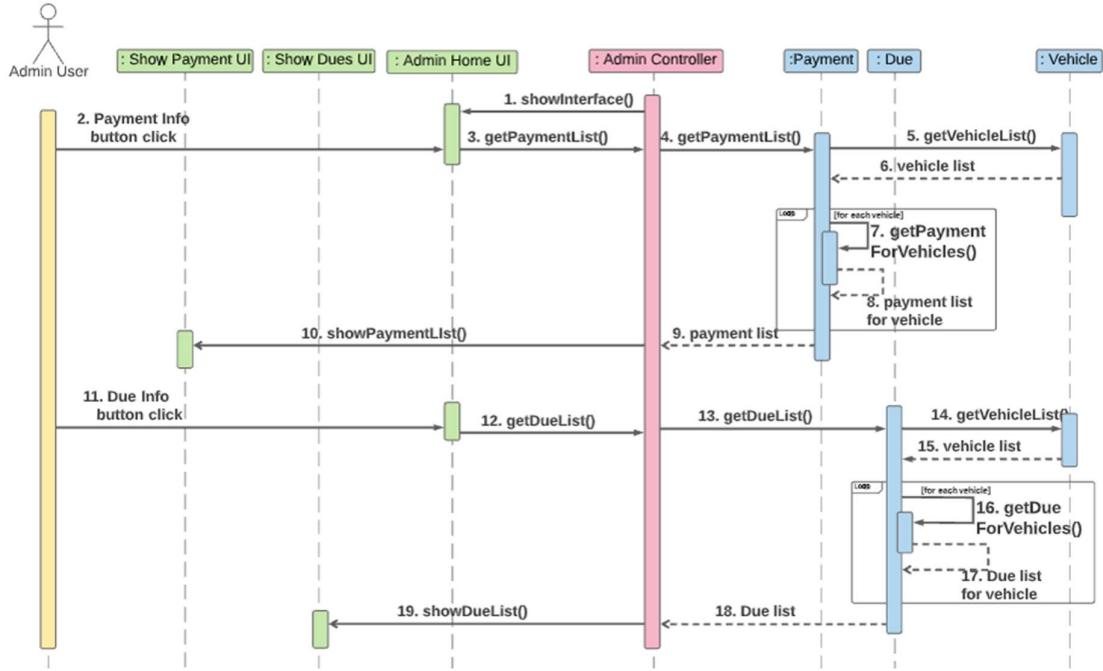
7.2.3 Toll Booth Management



7.2.4 Gateway Management

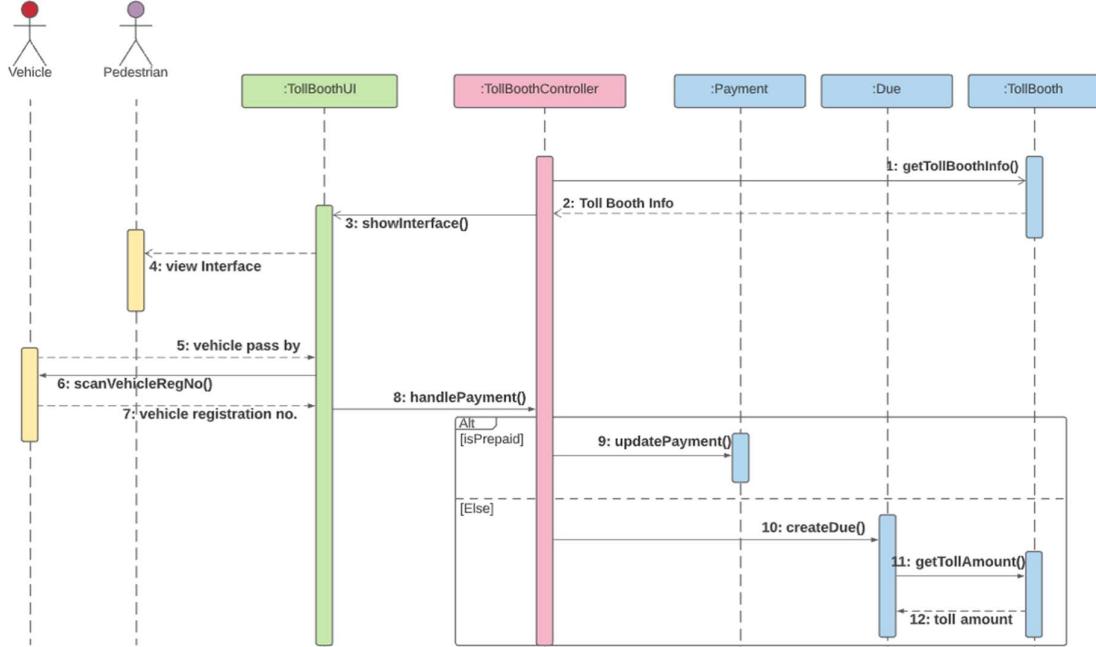


7.2.5 History



7.3 Toll Booth

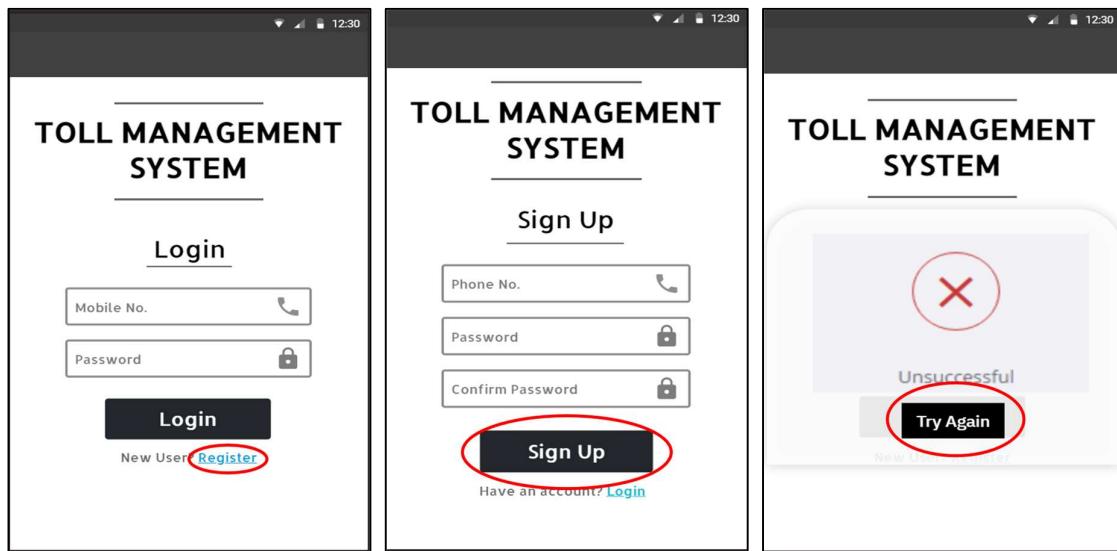
7.3.1 Finance Management



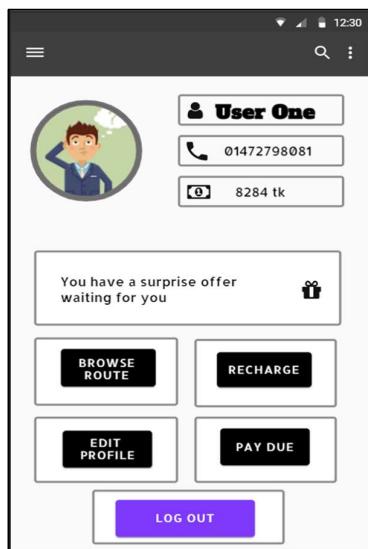
8 Mock UI

8.1 User Module

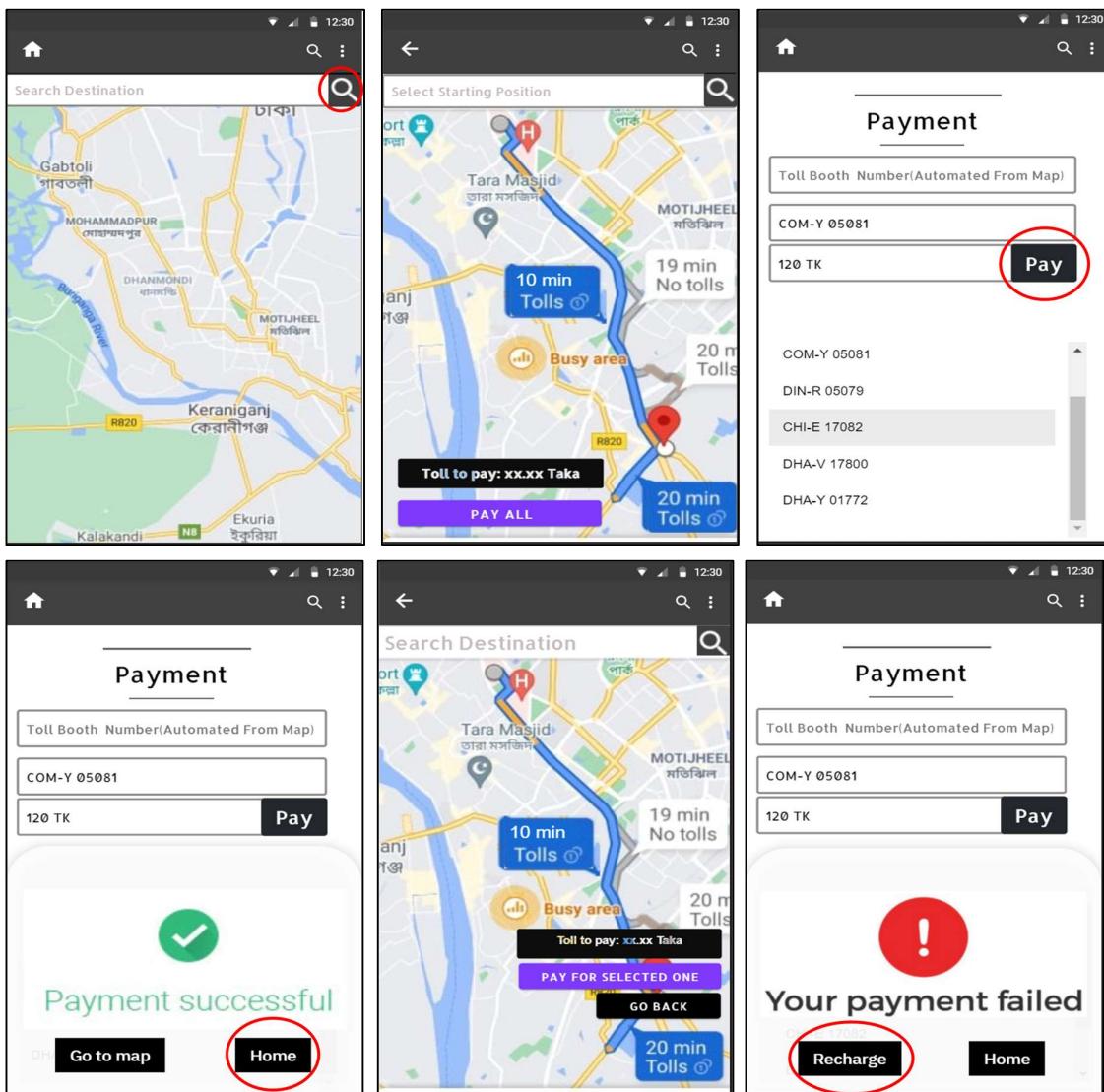
8.1.1 Login & Signup



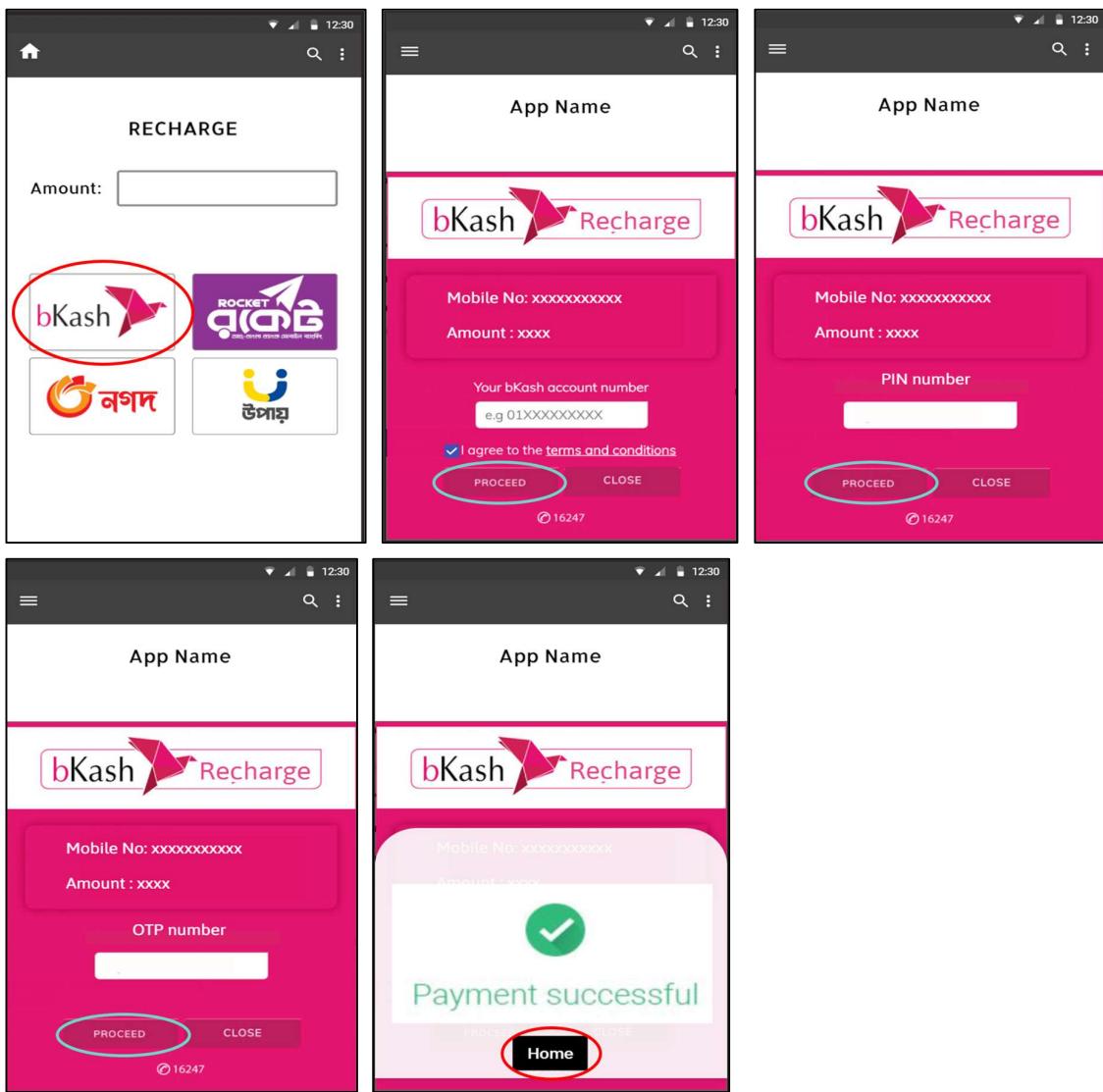
8.1.2 Homepage



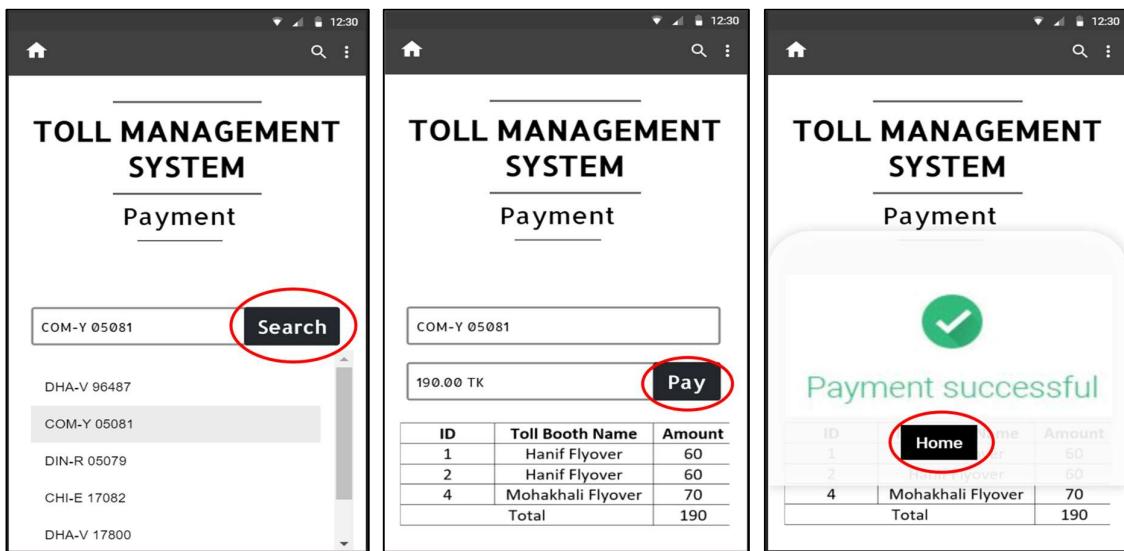
8.1.3 Browsing Route



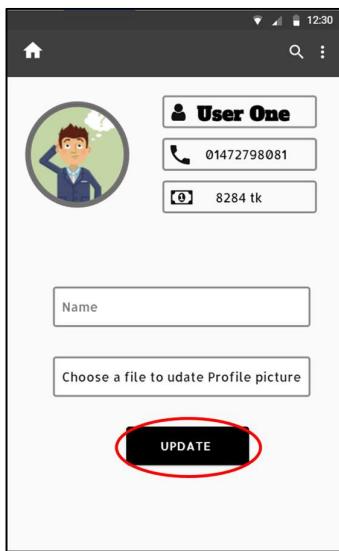
8.1.4 Recharge



8.1.5 Due Payment

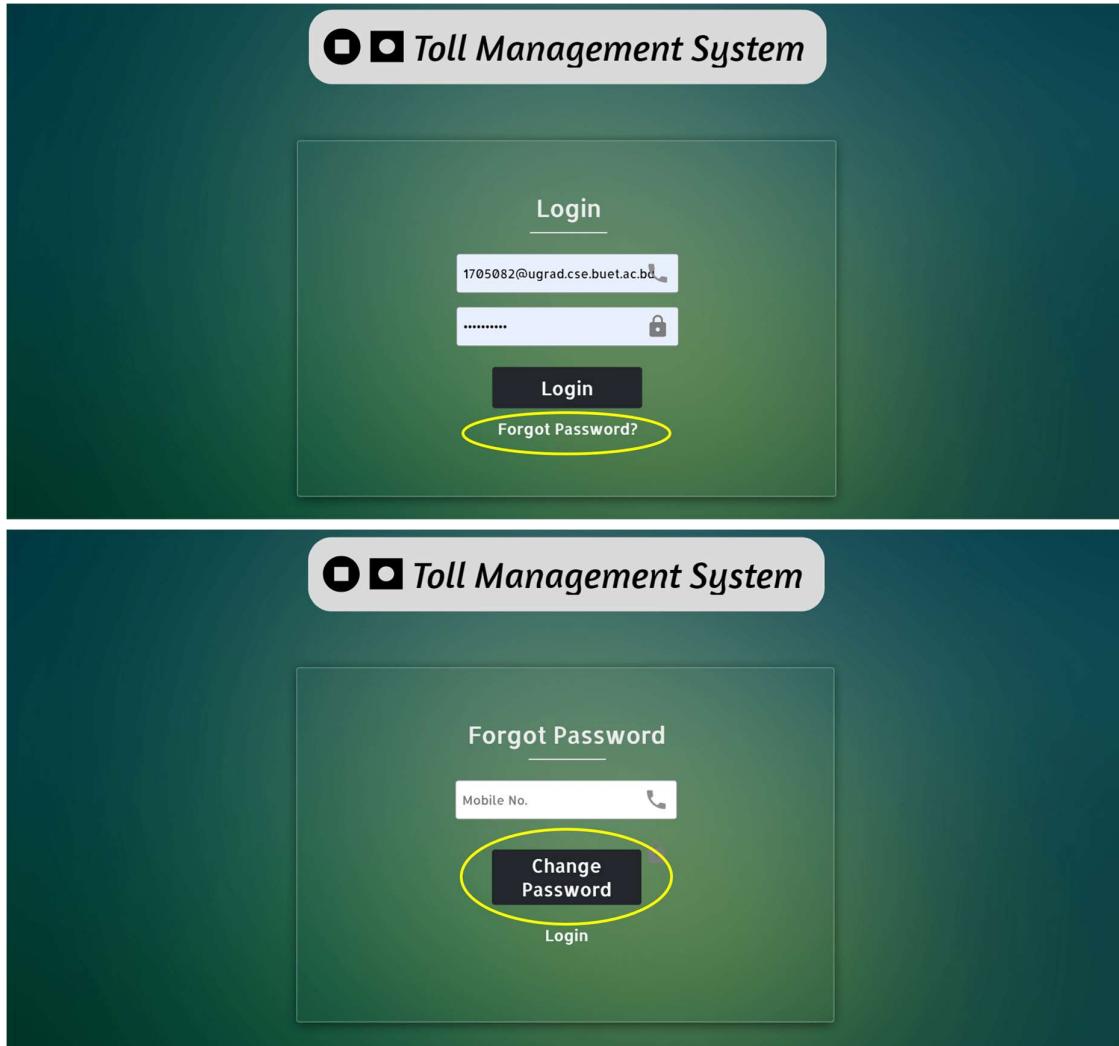


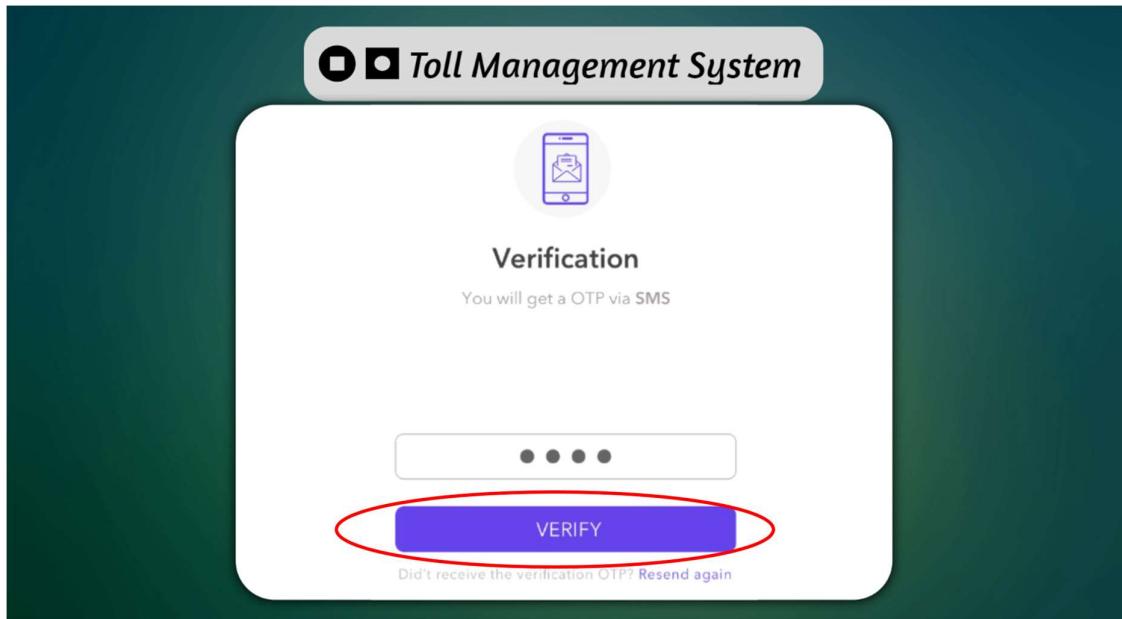
8.1.6 Edit Profile



8.2 Admin

8.2.1 Login & Forgot Password





8.2.2 Homepage



8.2.3 Add Toll Booth

The image shows the 'Add Toll Booth' page of the system. The top navigation bar is identical to the homepage. The main area has a 'Select Location' heading and a map of a city with various landmarks and roads. On the left, there is a form with fields for 'Toll Booth Name' and three buttons for selecting vehicle types ('Car', 'Bus', 'Truck') and their corresponding 'Amount'. Below these buttons are two large buttons: 'Save' (highlighted with a red circle) and 'Cancel'. The 'Save' button is highlighted with a red circle.

8.2.4 Toll List

Toll Management System

- [Add Toll Booth](#)
- [Tolls](#)
- [Payments](#)
- [Dues](#)
- [Logout](#)

ID	Toll booth name	Location	Action
1	Hanif Flyover	Jatrabari	Edit
2	Hanif Flyover	Dolaripar	Edit
3	Hanif Flyover	Sayedabad	Edit
4	Mohakhali Flyover	Mohakhali	Edit
5	Banani Overpass	Banani	Edit

[Go to home](#)

8.2.5 Payment List

Toll Management System

- [Add Toll Booth](#)
- [Tolls](#)
- [Payments](#)
- [Dues](#)
- [Logout](#)

Payment List

Vehicle Number	Toll Booth ID	Toll Booth Name	Payment Time	Arrival Time	Passed
DHA-1070	2	Hanif Flyover	2021-12-11 01:30:23	2021-12-12 02:30:23	Yes
CHI-1125	1	Hanif Flyover	2021-12-19 01:30:23		No
DHA-9810	3	Sayedabad	2021-12-19 01:30:23		No
CHI-8828	4	Mohakhali Flyover	2021-12-19 01:30:23	2021-12-19 01:40:23	Yes

[Go to home](#)

8.2.6 Dues List

 **Toll Management System**

Add Toll Booth Tolls Payments Dues Logout

Passed But Payment Due

Vehicle Number	Toll Booth ID	Toll Booth Name	Arrival Time	Owner Phone Number
DHA-1070	2	Hanif Flyover	2021-12-11 01:30:23	017-XXXX-XXXX
CHI-1125	1	Hanif Flyover	2021-12-19 01:30:23	017-XXXX-XXXX
DHA-9810	3	Sayedabad	2021-12-19 01:30:23	017-XXXX-XXXX
CHI-8828	4	Mohakhali Flyover	2021-12-19 01:30:23	017-XXXX-XXXX

[Go to home](#)

9 Snippets of Implemented Module

MVC architecture is used to implement our project. Besides:

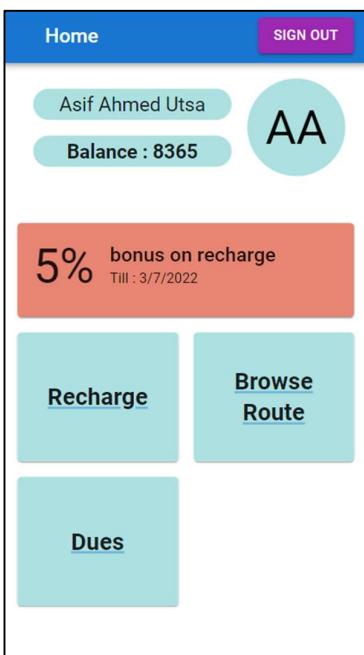
- Backend : Django
- Database : MySQL on Online Server
- Frontend : ReactJS

Views are below:

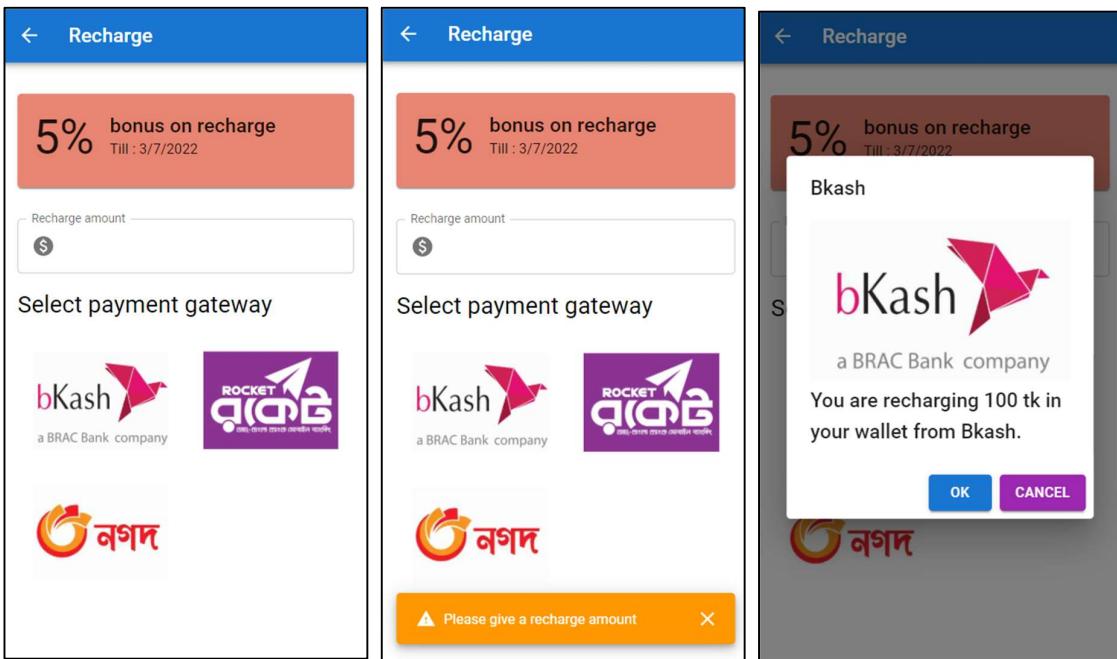
9.1 Login & Signup

The image displays three separate wireframe views of a mobile application's login and sign-up screens. The first view on the left shows a 'Sign in' screen with fields for 'Vehicle no *' and 'Password *', and a blue 'SIGN IN' button. The second view in the middle shows a 'Sign Up' screen with fields for 'Vehicle no *', 'Vehicle type *', 'NID card no *', 'First name *', 'Last name *', 'Mobile no *', and 'Email *'. The third view on the right shows a continuation of the sign-up process with fields for 'Last name *', 'Mobile no *', 'Email *', 'Address *', 'Password *', and 'Password (again) *', followed by a blue 'SIGN UP' button.

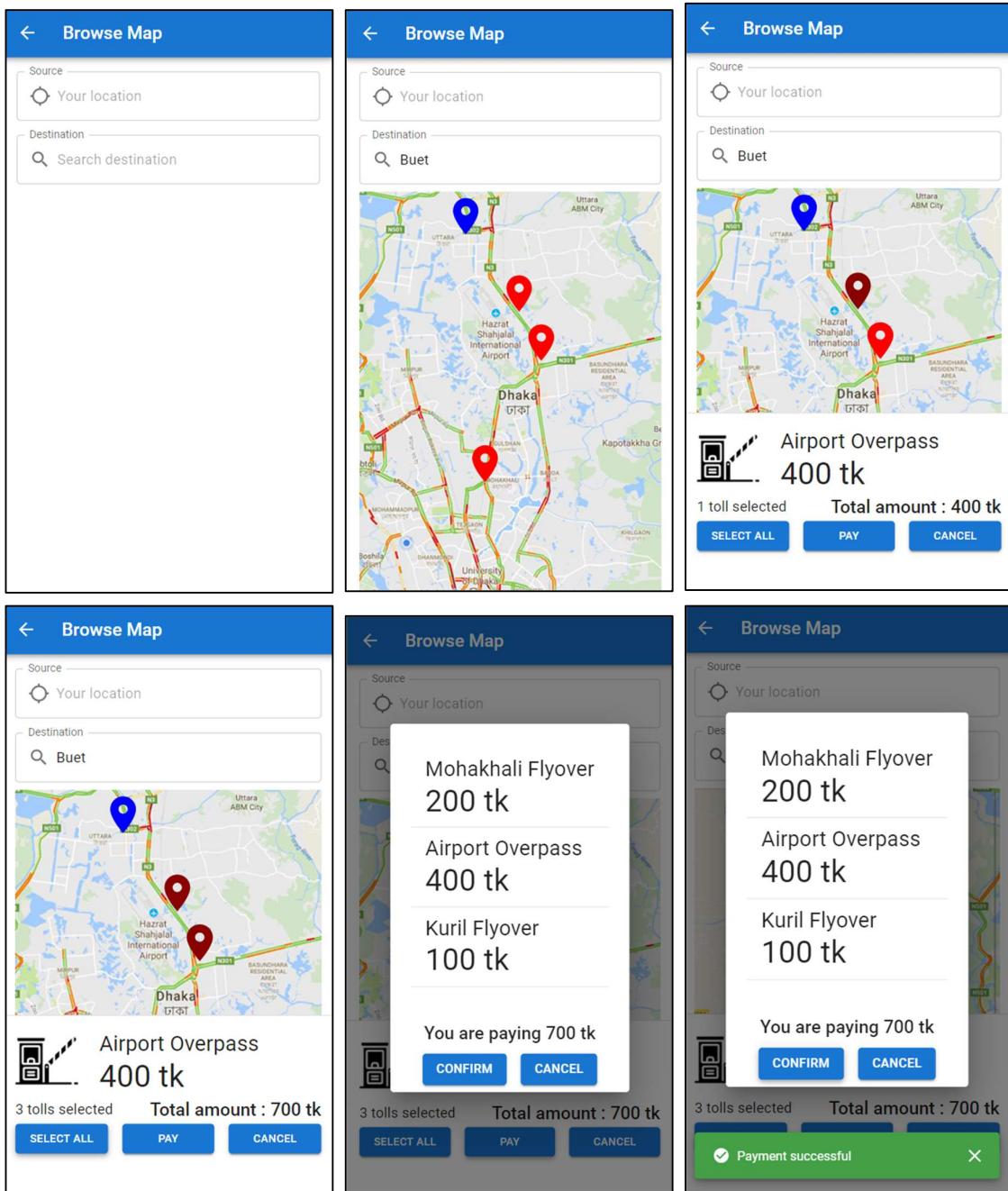
9.2 Homepage



9.3 Recharge



9.4 Route browsing



9.5 Dues History

The screenshots illustrate a mobile application interface for managing dues history and making payments.

Screenshot 1: Shows a list of dues history items. Each item includes the booth name, due amount, and a "SEE DETAILS" button. A large blue "PAY ALL" button is at the bottom.

Booth name	Due
Mohakhali Flyover	200
Airport Overpass	400
Kuril Flyover	100
Airport Overpass	400
Airport Overpass	400

Screenshot 2: Displays a detailed view of a due entry. It shows the booth name, due amount, vehicle number, date, and the amount being paid (200). Below this, a message says "You are paying 200 tk" with "CONFIRM" and "CANCEL" buttons.

Screenshot 3: Shows a confirmation dialog box. It displays the booth name, due amount, vehicle number, date, and the amount being paid (200). Below this, a message says "You are paying 200 tk" with "CONFIRM" and "CANCEL" buttons. At the bottom right, there is a green success message: "Payment successful" with a checkmark icon.

Screenshot 4: Shows a summary of total dues information. It lists two entries: Mohakhali Flyover (due 200) and Airport Overpass (due 400). Below this, a message says "You are paying 1500 tk" with "CONFIRM" and "CANCEL" buttons.

Total Due Information

Booth name	Due
Mohakhali Flyover	200
Airport Overpass	400

You are paying 1500 tk

10 Major Feedback

10.1 Major Feedback on BPMN Diagram

- We didn't show the arrows properly from where it comes and where it goes.
- In some modules (Payment, Reminder), there we didn't connect two nodes by arrow. It looks like floating. We should make a flow between all nodes.

10.2 Mock UI

- We made login system using Mobile no and Password. But we are suggested to take Vehicle no and Password to make Login system.
- We use this feedback in implemented module. In implemented module we take Vehicle no and Password for login.