



Module Code & Module Title

CS6PO5NT-Final Year Project

Assessment Weightage & Type

Final Year Project Proposal (25%)

Year and Semester

2024-25 Autumn

Student Name: Rabin Rai

London Met ID: 22073081

College ID: NP05CP4A220095

Assignment Submission Date: 8 January 2025

Internal Supervisor: Mr. Sonam Rai

External Supervisor: Mr. Utsav Dhungana

Title: MeroBus

I confirm that I understand my coursework needs to be submitted online via Google Classroom under the relevant module page before the deadline for my assignment to be accepted and marked. I am fully aware that late submissions will be treated as non-submission and a mark of zero will be awarded.

Page 1 of 49 - Cover Page

Untitled document



Islington College,Nepal

1 Document Details

Submission ID trn:oid:::3618:78101052

Submission Date

Jan 8, 2025, 11:36 AM GMT+5:45

41 Pages

Download Date

Jan 8, 2025, 11:38 AM GMT+5:45

5,009 Words

File Name

Untitled document

26,125 Characters

File Size

31.1 KB

Page 1 of 49 - Cover Page

2 25% Overall Similarity

The combined total of all matches, including overlapping sources, for each database.

Match Groups

-  **81** Not Cited or Quoted 22%
Matches with neither in-text citation nor quotation marks
-  **1** Missing Quotations 0%
Matches that are still very similar to source material
-  **11** Missing Citation 2%
Matches that have quotation marks, but no in-text citation
-  **2** Cited and Quoted 1%
Matches with in-text citation present, but no quotation marks

Top Sources

- 9%  Internet sources
- 1%  Publications
- 24%  Submitted works (Student Papers)

Integrity Flags

0 Integrity Flags for Review

Our system's algorithms look deeply at a document for any inconsistencies that would set it apart from a normal submission. If we notice something strange, we flag it for you to review.

A Flag is not necessarily an indicator of a problem. However, we'd recommend you focus your attention there for further review.

Match Groups

-  **81** Not Cited or Quoted 22%
Matches with neither in-text citation nor quotation marks
-  **1** Missing Quotations 0%
Matches that are still very similar to source material
-  **11** Missing Citation 2%
Matches that have quotation marks, but no in-text citation
-  **2** Cited and Quoted 1%
Matches with in-text citation present, but no quotation marks

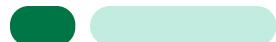
Top Sources

- 9%  Internet sources
- 1%  Publications
- 24%  Submitted works (Student Papers)

Top Sources

The sources with the highest number of matches within the submission. Overlapping sources will not be displayed.

1 Submitted works**islingtoncollege** on 2025-01-06 2%**2** Internet**www.globenewswire.com** 1%**3** Internet**www.coursehero.com** 1%**4** Submitted works**Softwarica College Of IT & E-Commerce** on 2021-10-04 1%**5** Submitted works**Blue Mountain Hotel School** on 2024-12-01 1%**6** Submitted works**University of Keele** on 2005-03-17 1%**7** Submitted works**nsbm** on 2020-11-09 1%**8** Submitted works**Al Akhawayn University** in Ifrane on 2019-05-07 1%**9** Submitted works**St. Xavier's College** on 2016-03-11 1%**10** Submitted works**King's Own Institute** on 2021-05-16 1%



Internet**0**

%

0

%

 Submitted works

0%
t

2.1
echnologyadvice.com 1%

0

%

0

%

	Submitted works	0%
12	Submitted works	
	Asia Pacific University College of Technology and Innovation (UCTI) on 2020-11-06	1%
13	Internet	
	www.diva-portal.org	1%
14	Submitted works	
	Gulf College Oman on 2014-07-06	0%
15	Submitted works	
	Higher Education Commission Pakistan on 2011-05-13	0%
16	Submitted works	
	University of Northumbria at Newcastle on 2024-08-22	0%
17	Submitted works	
	University of Wolverhampton on 2020-06-07	0%
18	Submitted works	
	Monash University on 2023-07-16	0%
19	Submitted works	
	University of Greenwich on 2018-04-28	0%
20	Submitted works	
	Turku University of Applied Sciences on 2024-11-25	0%
21	Submitted works	
	University of Ulster on 2024-12-05	0%
22	Submitted works	
	University of Bolton on 2024-06-06	0%
23	Submitted works	%
	University of Greenwich on 2017-12-09	0%

**0%**

Submitted works**University of Houston Clear Lake on 2024-04-01****0****%**

0**%**



Submitted works

0%

2.2 Bradford College, West Yorkshire on 2023-04-19

0

%

0

%

	Submitted works	0%
	Submitted works	0%
Canterbury Christ Church University on 2024-07-29		0%
	Submitted works	0%
The British College on 2023-07-21		0%
	Submitted works	0%
islingtoncollege on 2025-01-08		0%
	Submitted works	0%
Singapore Institute of Technology on 2019-08-02		0%
	Submitted works	0%
Saxion Brightspace on 2024-12-18		0%
	Submitted works	0%
Softwarica College Of IT & E-Commerce on 2021-10-04		0%
	Submitted works	0%
Dudley College on 2023-11-13		0%
	Submitted works	0%
Macquarie University on 2023-04-05		0%
	Submitted works	0%
Universiti Tenaga Nasional on 2019-08-31		0%
	Submitted works	0%
University of Greenwich on 2024-04-26		0%
	Submitted works	0%
Colorado Technical University Online on 2024-08-17		0%
	Submitted works	0%
Kaplan College on 2024-08-07		0%
		0%
		%



0%

Submitted works

The British College on 2020-07-05



0

%



Submitted works

0%

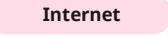
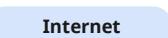
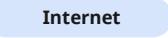
2.3 University of Wales Institute, Cardiff on 2023-05-14

0

%

0

%

	 Submitted works	0%
40	 Submitted works	0%
University of Wolverhampton on 2021-05-07		0%
41	 Internet	0%
cynoteck.com		0%
42	 Internet	0%
fastercapital.com		0%
43	 Submitted works	0%
Capella University on 2023-11-24		0%
44	 Submitted works	0%
University of Melbourne on 2021-09-14		0%
45	 Internet	0%
actabio.pl		0%
46	 Internet	0%
pdfcoffee.com		0%
47	 Submitted works	0%
AUT University on 2017-10-08		0%
48	 Submitted works	0%
Arab Open University on 2024-11-07		0%
49	 Submitted works	0%
Colorado Technical University Online on 2024-08-17		0%
50	 Submitted works	0%
Coventry University on 2011-01-21		0%
51	 Submitted works	0%
		0%
		0%

 Submitted works

0%

2.4 Ghana Technology University College on 2021-11-08

 52 Submitted works

2.5 Torrens Global Education Services Pty Ltd on 2024-08-27

0

%

0

%

Submitted works**0%****islingtoncollege on 2024-12-24****54****Submitted works****Kingston University on 2019-04-29****0%****55****Submitted works****Middle East College on 2025-01-02****0%****56****Submitted works****NCC Education on 2023-02-09****0%****57****Submitted works****Park Lane College on 2017-03-10****0%****58****Submitted works****The British College on 2024-05-26****0%****59****Submitted works****Westcliff University on 2021-11-15****0%****60****Publication****rizki wahyudi. "Implementing Forward, Backward Chaining and Certainty Factor i..." 0%****61****Submitted works****Arab Open University on 2024-11-07****0%****62****Submitted works****Gulf College Oman on 2016-01-30****0%****63****Submitted works****Roehampton University on 2019-12-15****0%****64****Submitted works****University of Bolton on 2024-04-20****0****0%****65****Submitted works****University of Greenwich on 2022-11-27****0****%**

**0%**

Submitted works

2.6 Amity University on 2015-04-03

0**%**

0

%

European University on 2017-01-10

68	Submitted works	
HTM (Haridus- ja Teadusministeerium)	on 2023-12-25	0%
<hr/>		
69	Submitted works	
City University of Hong Kong	on 2013-07-11	0%
<hr/>		
70	Submitted works	
2.7	University	of
Wolverhampton	on 2021-05-07	0%

Table of Contents

1	Document Details	2
2	25% Overall Similarity.....	3
2.1	technologyadvice.com 1%.....	7
2.2	Bradford College, West Yorkshire on 2023-04-19.....	10
2.3	University of Wales Institute, Cardiff on 2023-05-14	13
2.4	Ghana Technology University College on 2021-11-08.....	15
2.5	Torrens Global Education Services Pty Ltd on 2024-08-27	15
2.6	Amity University on 2015-04-03	17
2.7	University of Wolverhampton on 2021-05-07 0%.....	18
1	Introduction	1
1.1	Project Description	1
1.2	Current Scenario	2
1.3	Problem domain and project as a solution	2
1.3.1	Problem domain	2
1.3.2	Project as a solution	3
1.4	Aims and objective	4
1.4.1	Aims	4
1.4.2	Objective	4
2	Background	5
2.1	About the client/end-user	5
2.2	Benefits of apps like MeroBus	5
2.3	Challenges in MeroBus	5

2.4	Similar projects	6
2.4.1	BusSewa	6
2.4.2	NagarBus	7
2.4.3	Travel Nepal Bus.....	8
2.5	Comparison	8
3	Development	9
3.1	Methodology	9
3.1.1	Considered Methodology	9
3.1.2	Selected Methodology.....	10
3.1.3	Reason for choosing and rejecting methodology	11
3.2	Use case diagram.....	12
3.3	Collaboration diagram	12
3.4	Sequence diagram	13
3.5	Data Flow Diagram.....	13
3.6	Entity Relationship diagram.....	13
3.7	Class diagram.....	14
3.8	Code Screenshot.....	15
3.9	Commit	17
4	SRS	18
5	Pre-survey	18
6	Progress Analysis	20
6.1	Progress Review	20
6.1.1	Sprint 0: Initial Planning	20
6.1.2	Sprint 1: Authentication	20
6.1.3	Sprint 2: Map Integration and Location Tracking	20

6.1.4	Sprint 3: Driver Details Verification.....	20
6.2	Progress Table	21
6.3	Product Backlog	22
6.4	Wireframe	22
6.5	UI/UX Design.....	22
7	Further Work.....	23
7.1	Contingency Plan	24
8	References	25
9	Appendix.....	26
9.1	Survey	26
9.2	Product Backlog	30
9.3	Collaboration Diagram.....	31
9.4	Sequence Diagram.....	35
9.5	Data flow diagram.....	38
9.6	Wireframe	39
9.7	UI/UX Design.....	50
9.8	SRS	61
9.8.1	Introduction.....	61
9.8.2	Product Description.....	61
9.8.3	User Requirements	62
9.8.4	System Requirements	64

Table of Figures

Figure 1: Bus Station (The kathmandu post, 2020)	2
Figure 2 Similar project -1	6
Figure 3 Similar Project -2	7
Figure 4 Similar Project -3	8
Figure 5: Scrum Methodology (Scrum.org, 2024).....	10
Figure 6 Use case Diagram	12
Figure 7 Initial ERD.....	13
Figure 8 Class Diagram9	14
Figure 9 Frontend code	15
Figure 10 Backend Code	16
Figure 11: GitHub commit	17
Figure 12 Overall response for my FYP survey form.....	18
Figure 13 Survey question -1	19
Figure 14 Survey question – 2	26
Figure 15 Survey question – 3	27
Figure 16 Survey Question – 4	27
Figure 17 Survey Question – 5	28
Figure 18 Survey Feedback.....	29
Figure 19 Collaboration Diagram – becomeDriver	31
Figure 20 Collaboration Diagram - trackBus.....	32
Figure 21 Collaboration Diagram – bookBus	32
Figure 22 Collaboration Diagram - manageRoute	33
Figure 23 Collaboration Diagram – doChat	33
Figure 24 Collaboration Diagram – makePayment.....	34
Figure 25 Sequence Diagram - BecomeDriver.....	35
Figure 26 Sequence Diagram - TrackBus	35
Figure 27 Sequence Diagram - BookBus	36
Figure 28 Sequence Diagram - ManageRoute	36
Figure 29 Sequence Diagram - DoChat	37
Figure 30 Sequence Diagram – MakePayment.....	37

Figure 31 Data flow Diagram - Level 0	38
Figure 32 Wireframe - Login	39
Figure 33 Wireframe - Register.....	40
Figure 34 Wireframe - Forgot password	42
Figure 35 Wireframe - OTP insertion.....	44
Figure 36 Wireframe - change password.....	46
Figure 37 Wireframe - Profile Screen	47
Figure 38 Wireframe - Map Screen	48
Figure 39 Wireframe - Edit Profile	49
Figure 40 UI/UX - Get Started	50
Figure 41 UI/UX - Register	51
Figure 42 UI/UX - Login	52
Figure 43 UI/UX - Forgot Password.....	53
Figure 44 UI/UX - Verify OPT	54
Figure 45 UI/UX - Change password.....	55
Figure 46 UI/UX - Profile.....	56
Figure 47 UI/UX - Be Driver.....	57
Figure 48 UI/UX - After Role Switch	58
Figure 49 UI/UX - Edit Profile	59
Figure 50 UI/UX - Map	60

List of Table

Table 1: Comparison Table	8
Table 2: Progress Table	21
Table 3 Functional Requirement.....	62

1 Introduction

Transportation plays a crucial role in our daily lives. It enables us to travel efficiently to reach our destinations. In Nepal, roadways are the most common mode of transportation, which includes buses, taxis, and other vehicles. These vehicles can be accessed at bus stations or stops. The information about the routes is typically provided by the staff working in the sector of transportation. Travelers often rely on vehicle owners to track the current location of the vehicles.

To enhance the experience of traveling, this is the proposal for the development of a mobile application called MeroBus. It will offer real-time tracking of vehicles along specific routes. This application will provide users with live updates of the vehicles they want to take, enabling them to easily plan their journey. The application will provide detailed information about the vehicles, allowing users to get informed about the vehicles beforehand making traveling decisions. Through this application, the way travelers interact with the transportation system will change, making travel more efficient and reliable.

1.1 Project Description

MeroBus is a mobile application designed to improve the public transportation experience in Nepal by offering real-time tracking of vehicles along with specific routes. This application will provide users with live updates of the vehicles they want to take, enabling them to easily plan their journey. Through this application, the way travelers interact with the transportation system will change, making travel more efficient and reliable.

1.2 Current Scenario

According to Statista, the number of people using public transportation in Nepal is expected to reach 8.44 million by 2029 (statista, 2025). The most popular mode of transport in Nepal is via road. Public transportation can be a bus, minibus, or taxi. Local buses serve mainly the shorter and remote routes. The bus is usually overloaded. According to the Kathmandu Post, 'From 2005 to 2018, vehicle registration in Nepal increases at an annual growth rate of 14 percent. The growth indicates how rapidly urbanization has driven motorization across the country. In 2018, according to the Department of Transport Management, 96% of passenger vehicles were registered. As the numbers show, a vast majority of people rely on public transportation (thekathmandupost, 2020).



Figure 1: Bus Station (The kathmandu post, 2020)

1.3 Problem domain and project as a solution

1.3.1 Problem domain

Public transportation is the main transport system used and preferred by all citizens. It is used by millions of people every day. However, passengers often face different challenges that impact the efficiency and convenience of their travel.

The major issue is that everyone needs to rely on the static schedules of the buses or any other public transport. These schedules can be efficient only on the time when no external forces cause the delay but if any causes then the time cannot be accurate and

can cause a lot of time waste and long waiting time at bus stops for citizens. (Himalayan News Service, 2019)

When any person is traveling to unfamiliar places, they struggle to identify the correct transport for their travel, which can lead to missing buses as they are unfamiliar with the bus timing. The inefficiency of public transport leads people to rely on their own private vehicles. In 2018, 96% of registered passenger vehicles were private, with public transport vehicles constituting only 4% of the total fleet. (The kathmandu post, 2020)

This leads to an increase in traffic and crowding on the road and causes a lot of hazards.

1.3.2 Project as a solution

The problem scenario clearly shows the problem faced by public transportation users. To address this problem, this project as an innovative solution that can help to address the problem and solve the issues on those problems. This project will allow users to have more reliable, accessible, and efficient public transportation services. This project will help to get the users with live updates on the transport location and timing. It will decrease the reliance on static schedules of any transport and allow for more dynamic access to the schedules for the passengers.

The solution will help in the following ways: -

1. The travelers can track the real-time location of the buses, eliminating uncertainty and reducing waiting times.
2. The real-time update on the arrival of the transport can help users to plan their journey more efficiently.
3. Travelers traveling to unfamiliar places can find the desired vehicles easily.

1.4 Aims and objective

1.4.1 Aims

This project aims to develop a mobile application that will help users view the real-time location of the vehicles on the designated routes and allow users to plan their travel more efficiently

1.4.2 Objective

The objectives of this project are: -

1. Develop user-friendly mobile applications.
2. To learn about the mobile application development.
3. To integrate a real-time tracking system for vehicles.
4. To allow passengers to book seats on the vehicles.

2 Background

2.1 About the client/end-user

The “MeroBus” is a mobile application being developed for users to know about the live location of transport. The focus of the development is to allow drivers to share their location through this application and let the passengers view their live updates. Transportation management is crucial for any passenger to achieve a proper traveling experience. This application will aim to solve those problems. The users will be able to search for any route they want to take, and the application will show all the transports available on that route. The users will be able to choose any transport they want to take from the list of vehicles, and they should be able to view the details related to the vehicles just by tapping on the icon of those vehicles. They will be able to chat with other passengers through the chatting section of each vehicle. The users will be able to book vehicles for long routes.

2.2 Benefits of apps like MeroBus

MeroBus is an application that is being developed to help passengers or travelers to track down any transports going through their location. The drivers can share their location through the application, which will help them to get more passengers who are using the application. The passengers will have better control over their timing on reaching the bus stop and do not need to wait for longer if they arrive earlier than the arrival time.

2.3 Challenges in MeroBus

The application is workable if only the network is available else it will not function. Travelers with normal phones and living in areas with a lack of internet services cannot utilize this application. It requires drivers to be connected to the internet all the time to share their location, which can be costly for drivers, and they may not want to do so.

2.4 Similar projects

2.4.1 BusSewa

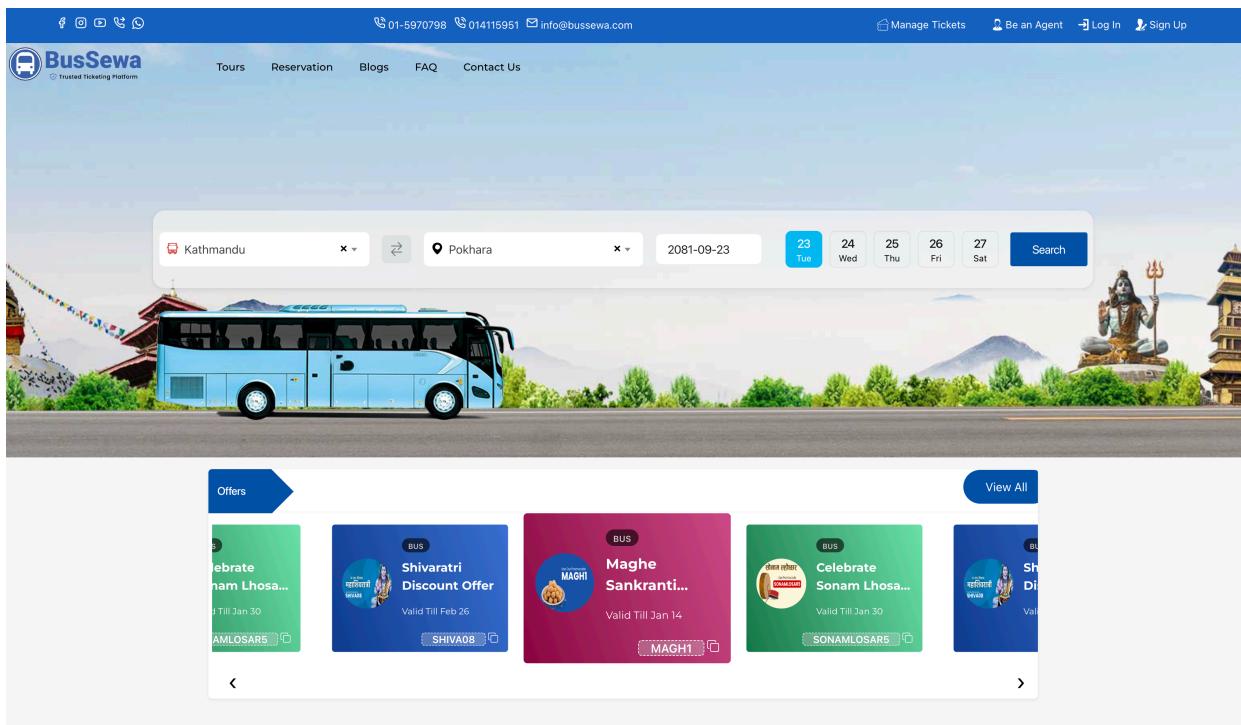


Figure 2 Similar project -1

BusSewa is a web and application-based software where users can book buses for all routes over Nepal from both website and application. It provides multiple price offers coupons. On this website, users can not only book buses, but they can also reserve vehicles for rent on an hourly basis, for airport pickup, and for tours. It has 300+ bus routes, 50k daily inventory with 300+ bus partners and 1k daily buses on the road. It is the fastest-growing online ticket-booking platform.

2.4.2 NagarBus

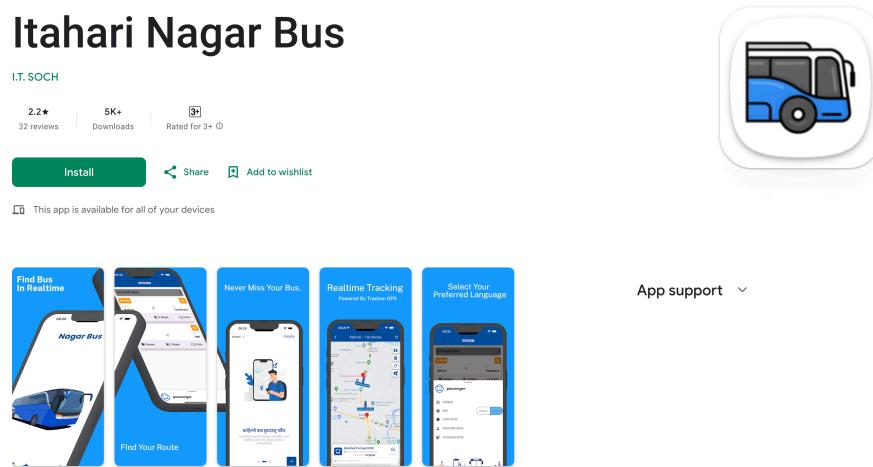


Figure 3 Similar Project -2

It is a real-time bus monitoring application where users can view the live location of the buses. This project was developed by the government of the Itahari, Sunsari. It is great work done by the government side for the user, due to this application, many users from Itahari find it easier to travel within their town. Its key features are real-time bus routes, live bus location tracking, and comprehensive bus stop points.

2.4.3 Travel Nepal Bus

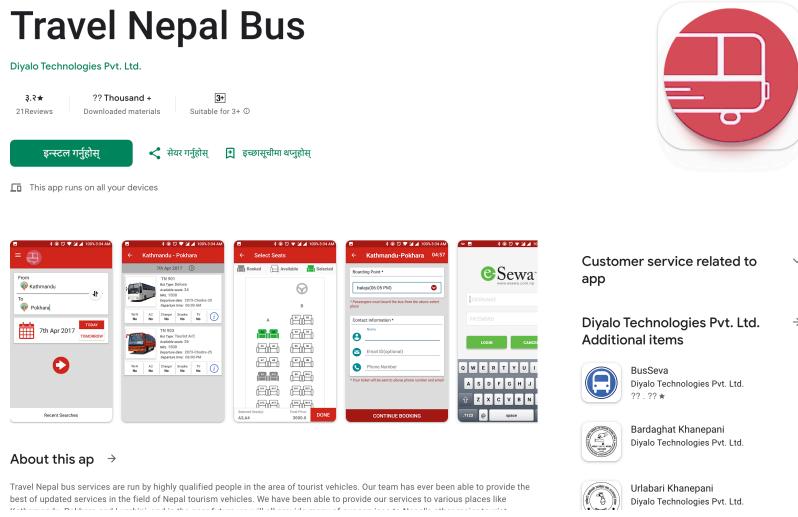


Figure 4 Similar Project -3

Travel Nepal Bus mobile-based bus booking application that mostly targets tourists. It provides services in Kathmandu, Pokhara, and Lalitpur and in the near future planning to provide service in major tourist places. It provides features like booking buses, selecting seats, online payment, and a list of buses.

2.5 Comparison

Table 1: Comparison Table

S.N.	Features	BusSewa	NagarBus	Travel Nepal Bus	Mero Bus
1.	Register	Yes	No	No	Yes
2.	Login	Yes	No	No	Yes
3.	Password Reset	Yes	No	No	Yes
4.	Bus booking	Yes	No	Yes	Yes
5.	Live tracking	Yes	Yes	No	Yes
6.	Payment	Yes	No	Yes	Yes
7.	Chatting between users	No	No	No	Yes
8.	Map View	No	Yes	No	Yes
9.	Bus Review	No	No	No	Yes

3 Development

3.1 Methodology

3.1.1 Considered Methodology

3.1.1.1 Rational Unified Process (RUP)

Rational Unified Process (RUP) is a software development methodology that helps assign tasks and develop high-quality software according to users' needs. It leverages team productivity and creates and maintains a model. (Mrsic, 2024)

Its advantages are: -

1. It allows flexibility in the requirement development changes.
2. It helps to break the project into manageable iterations, which helps identify and resolve risks.
3. It divides the project into different phases ensuring structured software development.

3.1.1.2 Kanban

Kanban is a lean workflow management strategy that originated in Agile and DevOps software development teams to support continuous delivery. The word kanban comes from the Japanese word, which means “card” or “billboard”. (Sherrer, 2023)

Its advantages are: -

1. It helps to visualize workflows.
2. It increases transparency in the assignment allocation of the tasks.
3. It decreases overworking for employees.

3.1.2 Selected Methodology

3.1.2.1 Scrum

After considering different methodologies, Scrum methodology was selected as the development methodology. Scrum is a process framework for managing product development and knowledge work, emphasizing practical approaches and flexibility. It is a way to do a work in small pieces at a time. It is executed in a small block of time, usually 2-4 weeks, called Sprint.

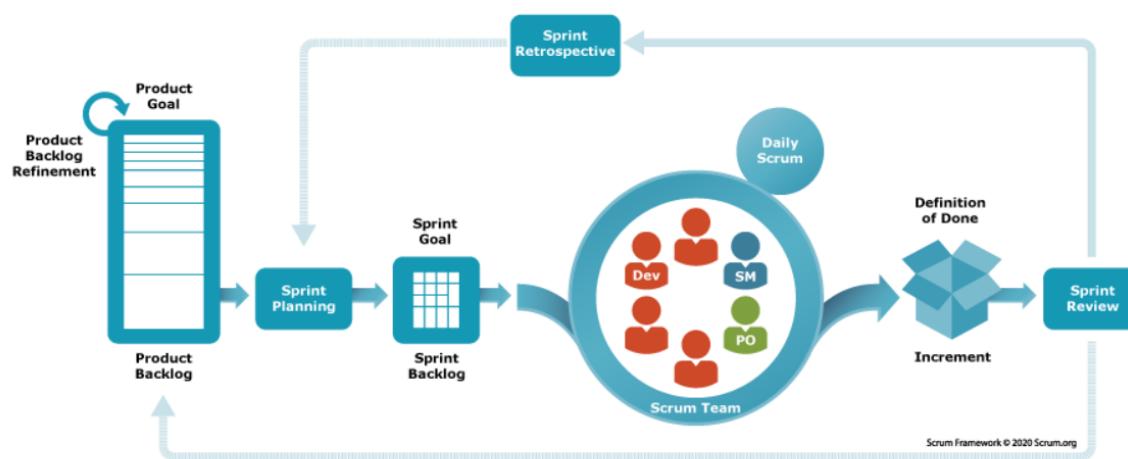


Figure 5: Scrum Methodology (Scrum.org, 2024)

Scrum Artifacts are used in this methodology to ensure transparency and provide critical information involved in the development process. These artifacts serve as the base for understanding progress, planning, and goal alignment within this framework. (Malsam, 2023)

1. Product Backlog: - This is a list of features, requirements, and tasks that need to be completed for the product.
2. Sprint Backlog: - It is a specific Product Backlog selected to do on the ongoing Sprint.
3. Product Increment: - It is the total completed Product Backlog items during a Sprint.

Scrum Events: -

1. Sprint Planning: - It's a meeting where the team plans the tasks and goals for the upcoming Sprint, selecting tasks from the Product Backlog to work on.
2. Daily Scrum Meeting: - This is a daily meeting during a Sprint where the team gathers to discuss progress and identify any problems.
3. Sprint Review: - It's a meeting at the end of the Sprint to inspect the Product Increment and gather feedback.
4. Sprint Retrospective: - It's a reflective meeting where the team evaluates the Sprint process to find what went well and discuss areas for improvement for upcoming Sprints.

3.1.3 Reason for choosing and rejecting methodology

Reason for rejecting RUP:

1. It consumes a lot of time through documentation, extensive planning, and iterative development cycles.
2. It is less flexible compared to agile methodology, especially in adapting to rapid changes.

Reason for rejecting Kanban:

1. It does not enforce deadlines or sprints, which can lead to delays and procrastination.
2. It relies heavily on discipline and self-management, which can be challenging for fast adaptability if there are some changes in the project.

3.2 Use case diagram

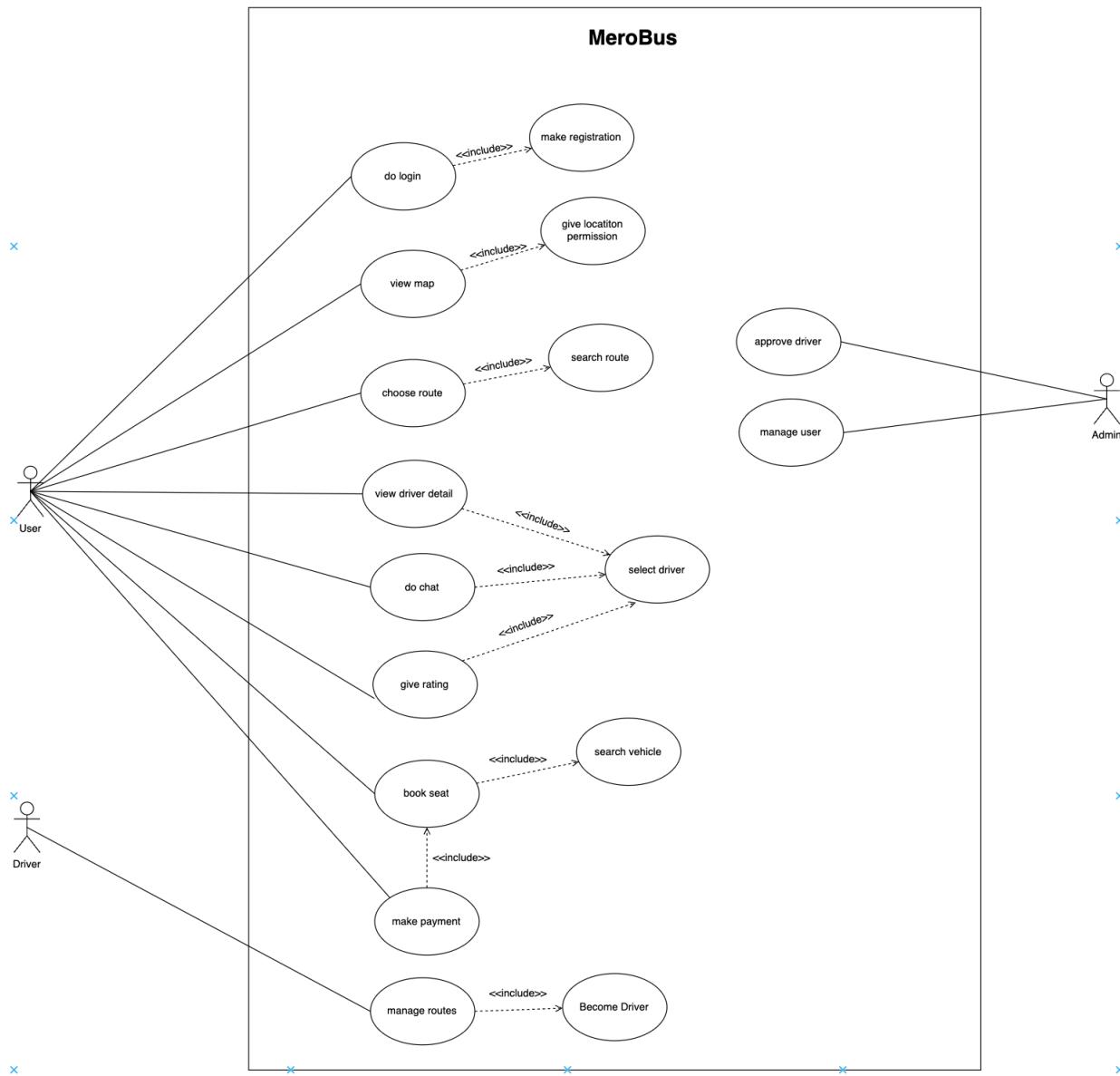


Figure 6 Use case Diagram

3.3 Collaboration diagram

Link: [Collaboration Diagram](#)

3.4 Sequence diagram

Link: [Sequence Diagram](#)

3.5 Data Flow Diagram

Link: [Data flow diagram](#)

3.6 Entity Relationship diagram

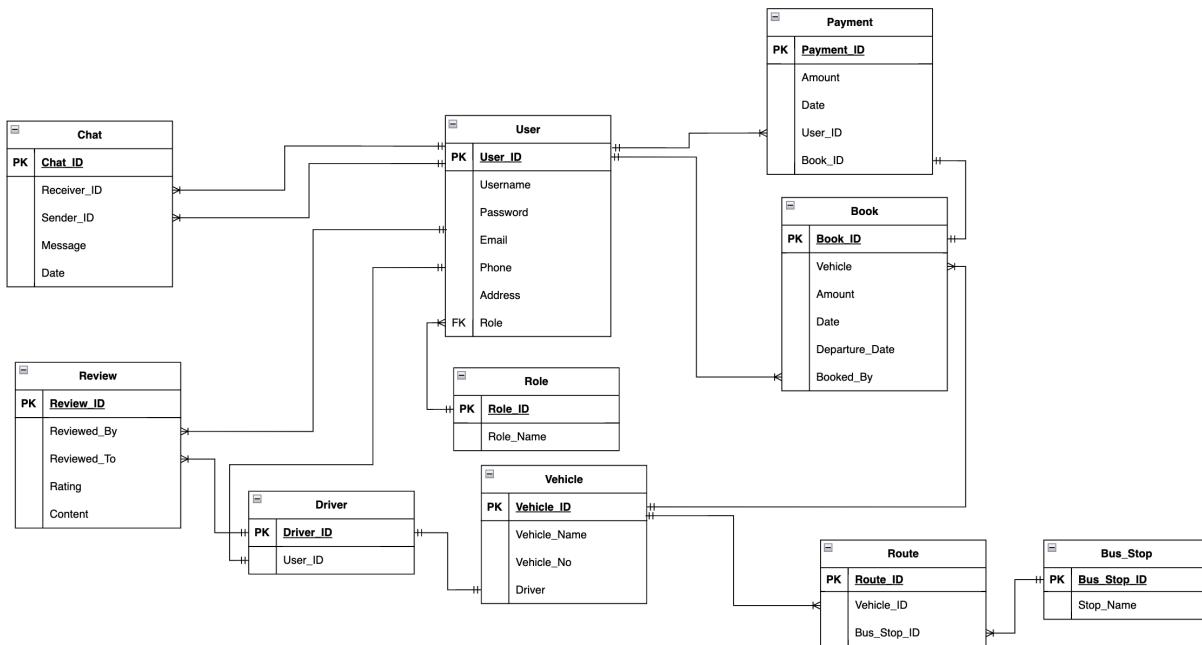


Figure 7 Initial ERD

3.7 Class diagram

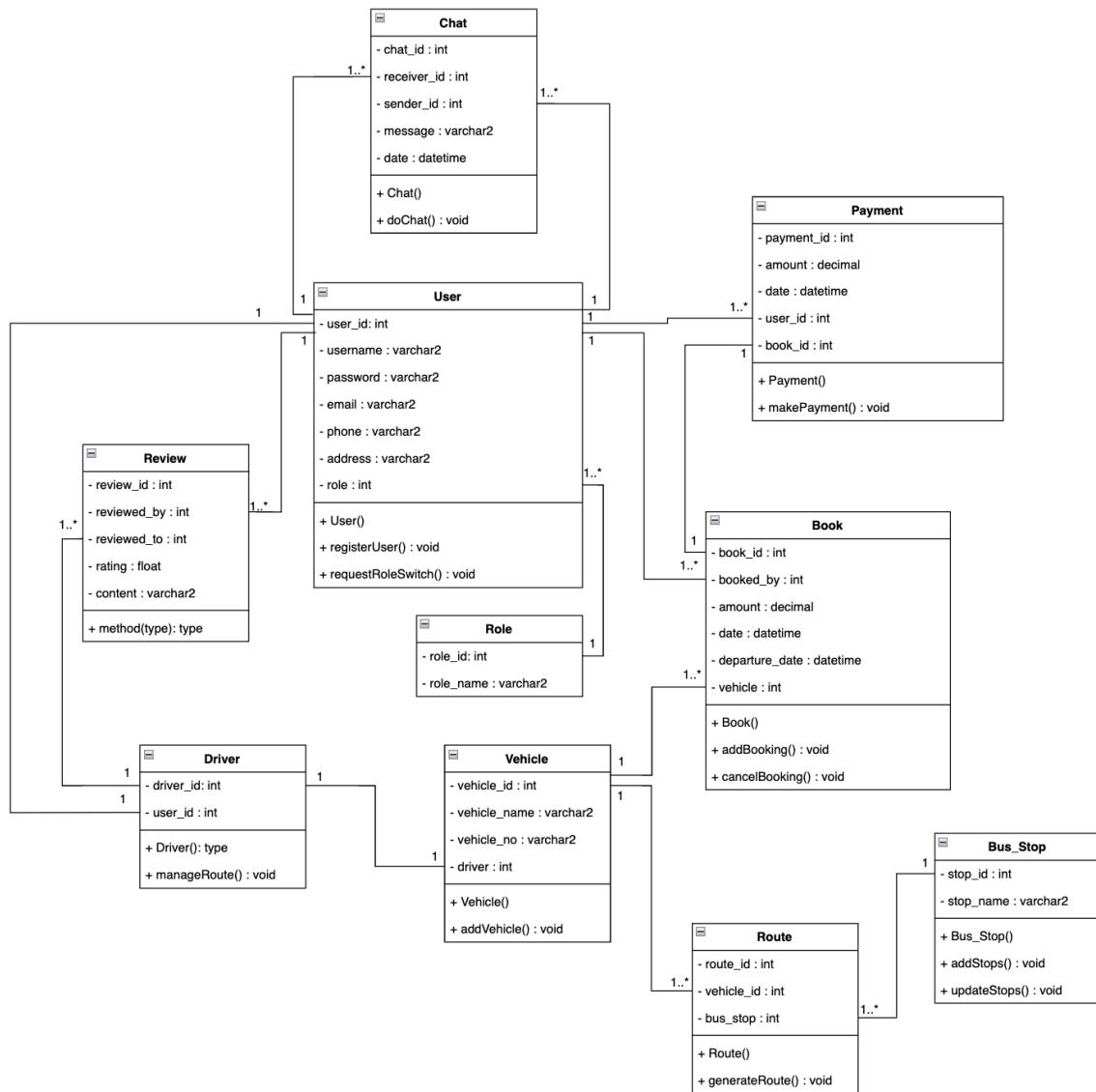


Figure 8 Class Diagram9

3.8 Code Screenshot

The screenshot shows a Flutter application structure in the Explorer panel on the left. The current file, `sign_in.dart`, is open in the main editor area. The code implements a `SignIn` widget and its `_SignInState` state class. It includes logic for handling user authentication, such as reading from shared preferences and calling the `authNotifier.login()` method. A tooltip is visible over the `authNotifier` variable, providing information about the `AuthNotifier` class.

```
merobus> lib> Screens> Authentication> signin.dart> _SignInState
You, last week | 2 authors (rabin2059 and one other)
1 import 'package:flutter/cupertino.dart';
2 import 'package:flutter/material.dart';
3 import 'package:flutter_riverpod/flutter_riverpod.dart';
4 import 'package:flutter_screenutil/flutter_screenutil.dart';
5 import 'package:go_router/go_router.dart';
6 import 'package:shared_preferences/shared_preferences.dart';
7 import '../../../../../Components/AppColors.dart';
8 import '../../../../../Components/CustomButton.dart';
9 import '../../../../../Components/CustomTextField.dart';
10 import '../../../../../providers/auth_provider.dart';
11 import 'forgot.dart';
12
You, last week | 2 authors (rabin2059 and one other) | Codemod: Refactor | Explain
13 class SignIn extends ConsumerStatefulWidget {
14   const SignIn({super.key});
15
16   @override
17   _SignInState createState() => _SignInState();
18 }
You, last week | 2 authors (rabin2059 and one other) | Codemod: Refactor | Explain
19 class _SignInState extends ConsumerState<SignIn> {
20   final TextEditingController emailController = TextEditingController();
21   final TextEditingController passwordController = TextEditingController();
22
23   bool isLoading = false;
24
25   Codemod: Refactor | Explain | Generate Function Comment | X
26   void _loginUser() async {
27     setState(() {
28       isLoading = true;
29     });
30
31     try {
32       final authNotifier = ref.read(authNotifierProvider.notifier);
33
34       final prefs = await SharedPreferences.getInstance();
35       final role = prefs.getInt('userRole');
36
37       // Await the result from register()
38       final success = await authNotifier.login(
39         emailController.text.trim(),
40         passwordController.text.trim(),
41       );
42
43       if (success) {
44         final role = ref.read(authNotifierProvider).userRole;
45         context.goNamed('navigation', extra: role);
46         // context.go('/login');
47       } else {
48         ScaffoldMessenger.of(context).showSnackBar(
49           const SnackBar(
50             content: Text('All Field Are Required'),
51           ),
52         );
53       }
54     } catch (e) {
55       print(e);
56     }
57   }
58 }
```

Figure 9 Frontend code

```

You, 2 weeks ago | 2 authors (abin2059 and one other)
You, 3 weeks ago + (Authentication) Dif Solved
1 // Import required dependencies
2 const prisma = require("../utils/prisma.js");
3 const bcrypt = require("bcrypt");
4 const validator = require("validator");
5 const jwt = require("jsonwebtoken");
6
7 // Handle user signup
8 const signUp = async (req, res) => {
9   try {
10     // Extract user details from request body
11     const {username, email, password, confirmPassword} = req.body;
12     console.log(req.body);
13
14     // Validate required fields
15     if (!username || !email || !password || !confirmPassword) {
16       return res.status(400).json({ message: "All fields are required" });
17     }
18
19     if (!validator.isEmail(email)) {
20       return res.status(400).json({ message: "Invalid email address" });
21     }
22
23     if (!validator.isStrongPassword(password)) {
24       return res.status(400).json({ message: "Password is not strong" });
25     }
26
27     // Check if passwords match
28     if (password !== confirmPassword) {
29       return res.status(400).json({ message: "Password didn't match !" });
30     }
31
32     // Check if user already exists
33     const existingUser = await prisma.user.findFirst({
34       where: {
35         email: email,
36       },
37     });
38
39     if (existingUser) {
40       return res.status(400).json({ message: "User already exists" });
41     }
42
43     // Hash password before storing
44     const hashPassword = await bcrypt.hash(password, 10);
45     console.log(hashPassword);
46
47     // Create new user in database
48     const user = await prisma.user.create({
49       data: {
50         username: username,
51         email: email,
52       },
53     });
54
55     // Generate JWT token
56     const token = jwt.sign({ id: user.id }, process.env.JWT_SECRET);
57
58     // Set cookie
59     res.cookie("token", token, {
60       httpOnly: true,
61       maxAge: 1000 * 60 * 60 * 24 * 7,
62     });
63
64     // Return response
65     return res.json({ message: "User signed up successfully", token });
66   } catch (error) {
67     console.error(error);
68     return res.status(500).json({ message: "Internal server error" });
69   }
70 }

```

Figure 10 Backend Code

3.9 Commit

The screenshot shows a GitHub commit history for the 'main' branch. The commits are organized by date, with a summary of changes and detailed commit messages.

- Commits on Dec 28, 2024:**
 - Merge pull request #2 from rabin2059/forgot · Verified · 9858f2a · < · Merge pull request #2 from rabin2059/forgot · rabin2059 authored 2 weeks ago
- Commits on Dec 22, 2024:**
 - (Data Flow) Made data flow of the users · 861179c · < · (Data Flow) Made data flow of the users · rabin2059 committed 2 weeks ago · 0 / 1
- Commits on Dec 20, 2024:**
 - (UI) Profile Screen · 85c5565 · < · (UI) Profile Screen · rabin2059 committed 3 weeks ago · 0 / 1
- Commits on Dec 19, 2024:**
 - (Map Added Google Map) · b82cbf8 · < · (Map Added Google Map) · rabin2059 committed 3 weeks ago · 0 / 1
 - (Change Role) minor change in the code for change role · fbf089b · < · (Change Role) minor change in the code for change role · rabin2059 committed 3 weeks ago · 0 / 1
- Commits on Dec 17, 2024:**
 - (User) update user · 5065a84 · < · (User) update user · rabin2059 committed 3 weeks ago · 0 / 1
- Commits on Dec 15, 2024:**
 - (Authentication) Otp Solved · 756d684 · < · (Authentication) Otp Solved · rabin2059 committed 3 weeks ago
 - (Map) Added Map · 57ae8df · < · (Map) Added Map · rabin2059 committed 3 weeks ago
- Commits on Dec 12, 2024:**
 - (Map Integration) initialize map integration · 0a09bb8 · < · (Map Integration) initialize map integration · rabin2059 committed last month
- Commits on Dec 9, 2024:**
 - (Error) · a0dd438 · < · (Error) · rabin2059 committed last month
- Commits on Dec 8, 2024:**
 - (Authentication) minor navigation change · 3f0caac · < · (Authentication) minor navigation change · rabin2059 committed on Dec 8, 2024

Figure 11: GitHub commit

4 SRS

Link: [SRS](#)

5 Pre-survey

The screenshot shows a Google Forms survey summary page. At the top, it displays "50 responses". There are three tabs: "Summary" (which is selected), "Question", and "Individual". A button labeled "Accepting responses" with a purple toggle switch is visible. Below the tabs, the heading "Who has responded?" is shown, followed by a list of 10 email addresses of respondents.

Email Address
np05ba4a220005@iic.edu.np
np05cp4a230045@iic.edu.np
arunshrestha588@gmail.com
rai000ranjana@gmail.com
khadkacshirrr@gmail.com
tamang18pradip@gmail.com
saujan538@gmail.com
pranayar228@gmail.com
munkunknow12345@gmail.com
<empty>

Figure 12 Overall response for my FYP survey form

The above figure displays the list of the people who participated in this survey. This survey helped to collect public opinion on the development of this project. It helped to get what the public will expect from this project in the future.

How often do you use public transportation?

50 responses

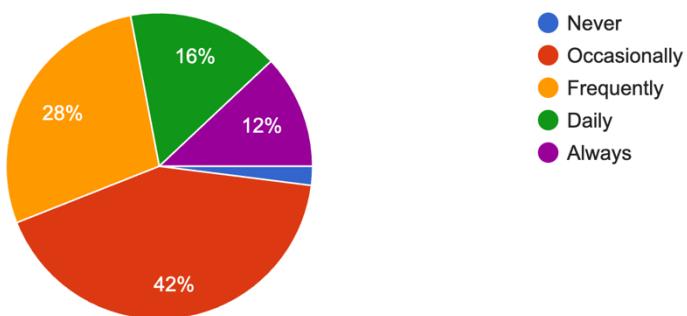


Figure 13 Survey question -1

The above figure shows that 42% of 50 people use public transport occasionally. Only 16% of 50 people use public transportation daily and 12% always use public transportation. Only 2% of them never take public transportation.

Link: [Survey](#)

6 Progress Analysis

6.1 Progress Review

6.1.1 Sprint 0: Initial Planning

In this stage, all the tasks related to the research on the project were done. The requirements gathering, feasibility analysis, survey, product backlog, and so on were the tasks that were completed at this stage.

6.1.2 Sprint 1: Authentication

In this stage, the users' authentication was done. The registration part and the login were developed and implemented in this stage. NodeMailer was used to mail and handle the OTP service for the forgotten password. The Sprint task was reviewed by the supervisor and was approved.

6.1.3 Sprint 2: Map Integration and Location Tracking

In this stage, the OpenStreetMap was used as the GoogleMap was paid. The map was integrated, and all the permissions were well handled. The search and polylines were also completed. The user can search any location and view that location.

6.1.4 Sprint 3: Driver Details Verification

For this stage, the users are able to apply for a role switch with all the required details. The admin can view the request, verify the details, and if correct approve for role switch. It is not fully completed.

6.2 Progress Table

This project is being developed following the Scrum Methodology. The Scrum Methodology has a sprint of a constant time interval, normally 2 or 3 weeks. This project has at most 10 sprints, and to this date, 3 of the sprints have been completed.

Table 2: Progress Table

S.N.	Tasks	Status	Progress
1.	Topic Selection	Completed	100%
2.	Feasibility Study	Completed	100%
3.	Requirement Gathering	Completed	100%
4.	Proposal	Completed	100%
5.	Develop use case diagram	Completed	100%
6.	Develop collaboration diagram	Completed	100%
7.	Develop sequence diagram	Completed	100%
8.	Develop ERD	Completed	100%
9.	Develop SRS Document	Completed	100%
10.	Research on similar project	Completed	100%
12.	Sprint 1: Authentication	Partially Complete	100%
13.	Sprint 2: Map Integration and Location tracking	In Progress	100%
14.	Sprint 3: Driver Details Verification	Not Completed	40%
15.	Sprint 4: Driver Details Display in map	Not Completed	0%
16.	Sprint 5: Bus Booking	Not Completed	0%
17.	Sprint 6: Rate Drivers and Application	Not Completed	0%
18.	Sprint 7: Payment	Not Completed	0%
19.	Sprint 8: Chatting between users	Not Completed	0%
20.	Sprint 9: Testing	Not Completed	0%
21.	Sprint 10: Deployment	Not Completed	0%

6.3 Product Backlog

Link: [Product Backlog](#)

6.4 Wireframe

Link: [Wireframe](#)

6.5 UI/UX Design

Link: [UI/UX Design](#)

7 Further Work

i. Sprint 3: Driver Details Verification

This part is done partially. For now, the user can apply to become a driver and the admin will just approve and the role will be changed. The role of the user who will be a driver will need to be both driver and passenger. In the coming days, the work will be done.

ii. Sprint 4: Driver Details Display on the map

This part is not started yet. The task will be carried out once the sprint 3 task is completed as the driver's details need to be present in the database to display their details on the map. Socket.IO will be used for live data sharing between the driver and the users.

iii. Sprint 5: Bus Booking

Once the sprint 4 tasks are completed, the booking system of the bus will be developed. In this part, the booking will only be possible for long route journeys i.e. Kathmandu to Itahari. Users will be able to choose vehicles from the devices and can see the available seats and choose as per their needs.

iv. Sprint 6: Rate Drivers and Application

The travelers can rate the experience with the application used or the drivers they traveled with. Based on the rating, the drivers will be categorized, and the users can find the best among them and choose that.

v. Sprint 7: Payment

For the payment part, Khalti API will be used. Payment is a part of booking, once the user books a seat, they can use this gateway to pay the price.

vi. Sprint 8: Chatting between users

Users can choose any vehicle they want to travel with and can find live updates from the passengers if they are also using the app. They can connect through the chat group for each driver.

vii. Sprint 9: Testing

Unit testing will be done in this sprint to find any bugs and errors and the code will be refined. All the frontend and backend will be integrated together and testing will be held.

viii. Sprint 10: Deployment

The backend will be deployed in Nginx and the frontend will be deployed in Play Store.

7.1 Contingency Plan

In case, any task fails to be finished in the given interval of sprint i.e. 2 weeks, the task will be completed in the coming sprint.

8 References

- Himalayan News Service, 2019. *Public transportation problems*. [Online] Available at: <https://thehimalayantimes.com/business/public-transportation-problems> [Accessed 1 12 2024].
- Malsam, W., 2023. *Scrum Methodology: An Introduction to the Scrum Process*. [Online] Available at: <https://www.projectmanager.com/blog/scrum-methodology> [Accessed November 2024].
- Mrsic, M., 2024. *Rational Unified Process (RUP)*. [Online] Available at: <https://activecollab.com/blog/project-management/rational-unified-process-rup> [Accessed 29 12 2024].
- Scrum.org, 2024. *What is Scrum?*. [Online] Available at: <https://www.scrum.org/resources/what-scrum-module> [Accessed 28 12 2024].
- Sherrer, K., 2023. *The Top Benefits of Kanban for Project Management*. [Online] Available at: <https://technologyadvice.com/blog/project-management/benefits-of-kanban/> [Accessed 29 12 2024].
- statista, 2025. *Public Transportation - Nepal*. [Online] Available at: <https://www.statista.com/outlook/mmo/shared-mobility/public-transportation/nepal#:~:text=Public%20Transportation%20%2D%20Nepal-,Nepal,through%20online%20sales%20by%202029> [Accessed 4 1 2025].
- The kathmandu post, 2020. *Restoring public transport*. [Online] Available at: <https://kathmandupost.com/editorial/2020/07/13/restoring-public-transport> [Accessed 1 12 2024].
- thekathmandupost, 2020. *Restoring public transport*. [Online] Available at: <https://kathmandupost.com/editorial/2020/07/13/restoring-public-transport> [Accessed 3 1 2025].

9 Appendix

9.1 Survey

Do you currently face any of these issues with public transportation? (Select all that apply)

50 responses

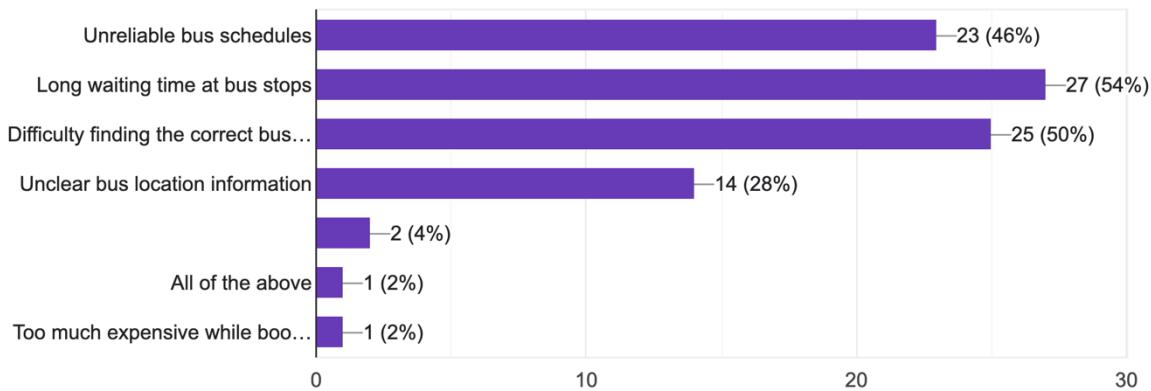


Figure 14 Survey question – 2

The above chart shows what kind of problems users face related to public transportation. It shows that 54% of them face the problem of long waiting at the bus stop 2% of them face the problem of all the problems mentioned and 2% of them face the problem of having too expensive booking.

What do you think about an application(MeroBus) that can help track any vehicle's live location?
50 responses

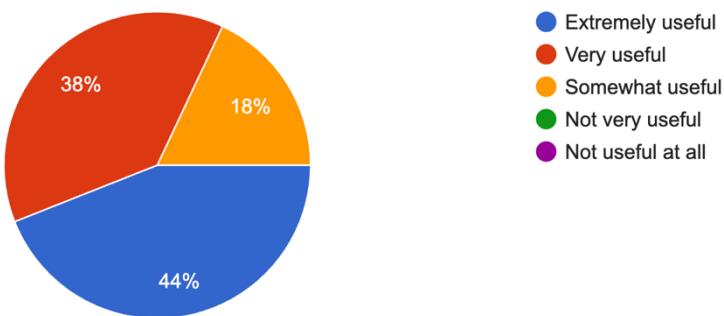


Figure 15 Survey question – 3

The above figure shows how people will think about this project. 44% of them think that the project will be extremely useful, 18% of them think that it will be somewhat useful and no one thinks that this will not be useful.

What are the features you would want to see in MeroBus?

50 responses

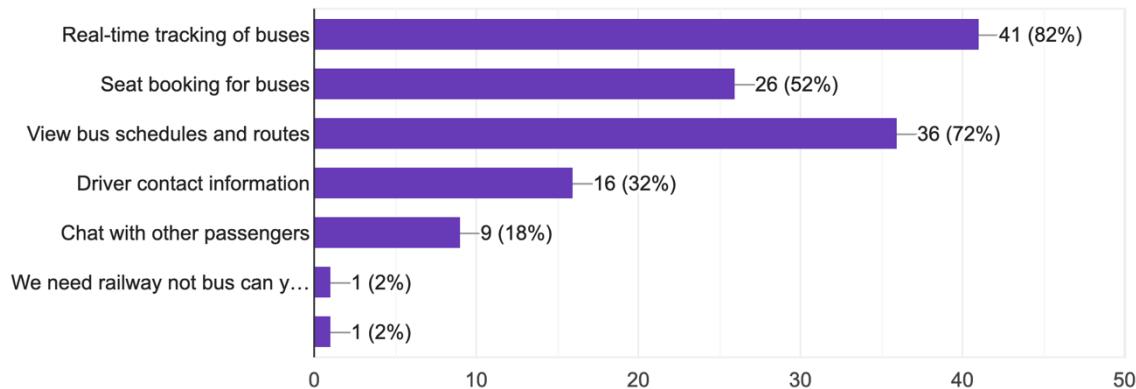


Figure 16 Survey Question – 4

The above figure shows what kind of features users will want to see in this application. It shows that most of the people want to have real-time tracking of buses and only a few of them want to have chatting features i.e. 82% and 18% respectively. And few of them suggested other options.

How satisfied are you with the current public transportation condition?

50 responses

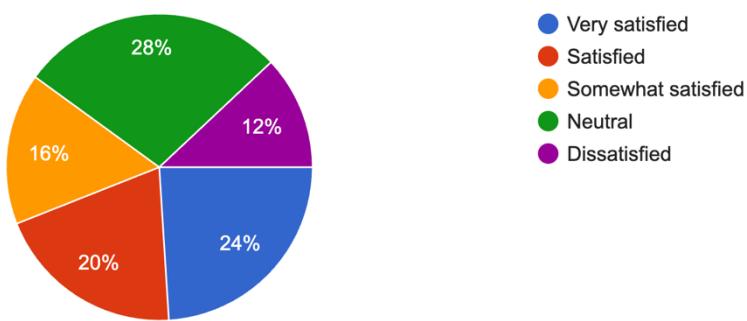


Figure 17 Survey Question – 5

The figure above shows how satisfied are the people with the current public transportation condition. It shows that 28% of them are neutral about this and 24% of them are very satisfied. Only 12% of them seem to be dissatisfied with the current condition of the transportation.

What are your thoughts about the development of this project? And what advice would you like to give me, please write down the comments

14 responses

It useful in cities like Kathmandu. In Kathmandu we really face challenges even after leaving for a month. That's why we have to use Pathao or indrive which is comparatively expensive.

Good

Thoughts of this project is very nice and it is a nice idea to know about the thoughts of other people too

About this app mero bus it's extremely useful and can help many other peoples at certain time and condition. I would recommend to create more of these kinds of app.

Keep Going

The development of a Mero Bus Tracker in Nepal is a brilliant idea, addressing a real and urgent issue. Public transport users, especially students, working individuals, and those facing emergencies like rushing to a hospital someone (who don't have any vehicles), often endure uncertainty and long waits for buses. This app could save valuable time, reduce stress, and provide reliability during critical moments—a much-needed solution for Nepal's everyday challenges.

Figure 18 Survey Feedback

The above figure shows what the people think about this project and what will be needed to be done in the development so that it can be useful to them. By the way, the public responded to the survey, it seems like this project is very likable to the public and they seem to be ready to use the application if their expectations of there is met.

9.2 Product Backlog

Epic 1: Authentication

User Story 1.1: As a user, I want to log in to the application using my credentials so that I can access the features of the application and access my account.

User Story 1.2: As a user, I want to reset my password if I forget it.

User Story 1.3: As a user, I want to have an app interface as per my role.

Epic 2: Map Integration

User Story 2.1: As a user, I want to routes displayed in map.

User Story 2.2: As a user, I want to view real-time updates of bus locations.

Epic 3: Payment System

User Story 3.1: As a user, I want to pay for the seat I am booking through secure gateway.

User Story 3.1: As a user, I want to view my transaction history.

Epic 4: Notification

User Story 4.1: As a user, I want to receive notification on every transactions.

User Story 4.2: As a driver, I want to receive notifications on every seat booked.

Epic 5: Rating and feedback

User Story 5.1: As a user, I want to rate the ride and send my review on the experience.

User Story 5.2: As a user, I want to give my valuable feedback on my application experience.

Epic 6: Driver Side

User Story 6.1: As a driver, I want to update my live locations for passengers.

User Story 6.2: As a driver, I want to manage my routes and personal details.

User Story 6.3: As a driver, I want to view all the seat-booked details.

Epic 7: Passenger Side

User Story 7.1: As a passenger, I want to search for the available vehicles on the route.

User Story 7.2: As a passenger, I want to book seats on any specific vehicle.

9.3 Collaboration Diagram

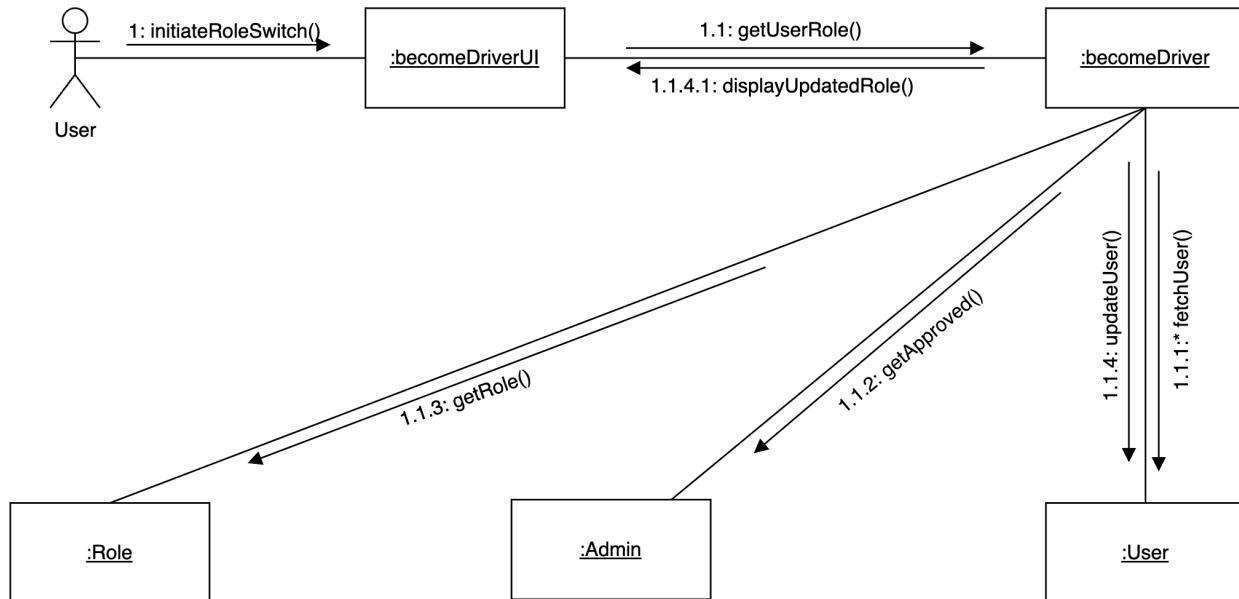
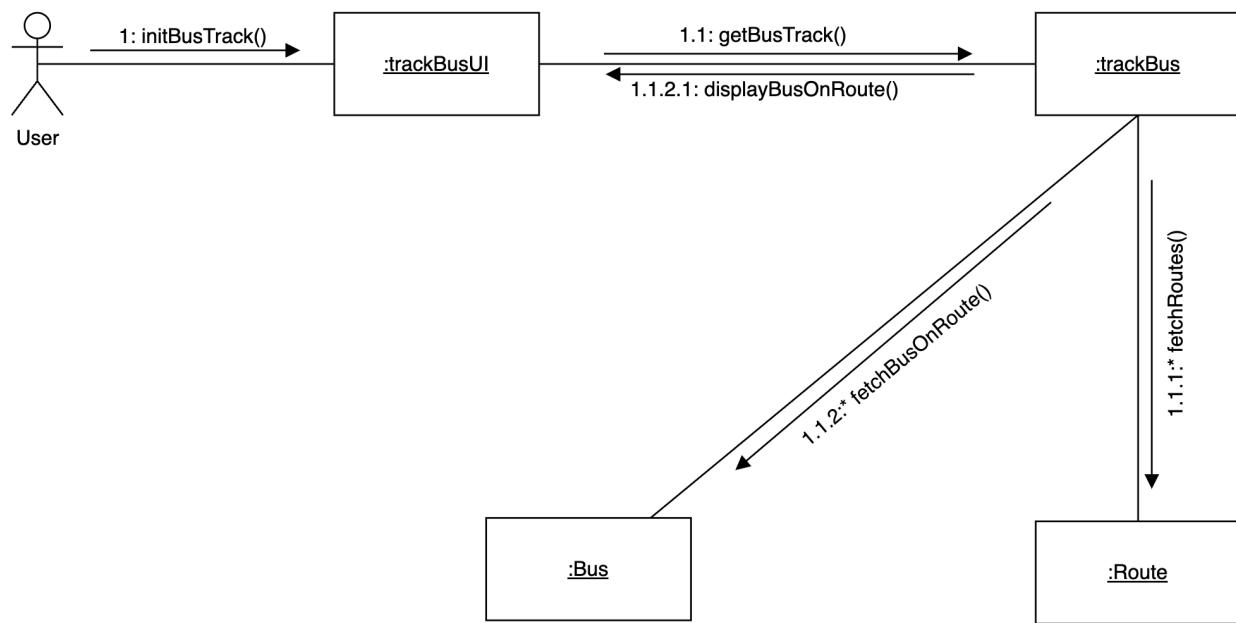
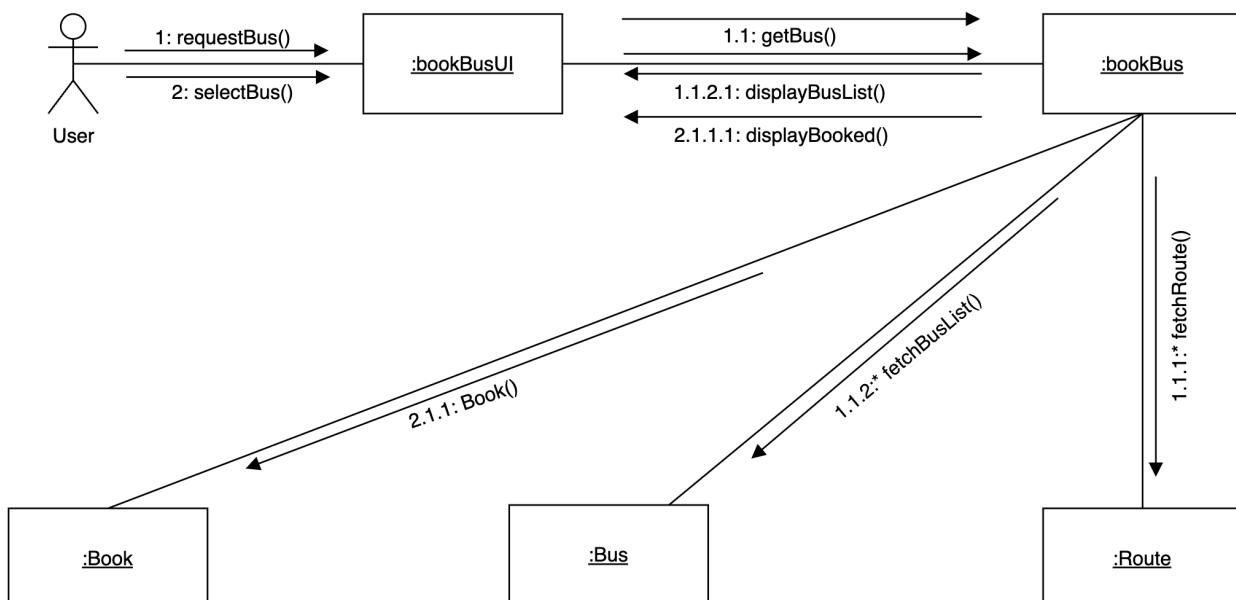


Figure 19 Collaboration Diagram – becomeDriver

Figure 20 Collaboration Diagram - *trackBus*Figure 21 Collaboration Diagram – *bookBus*

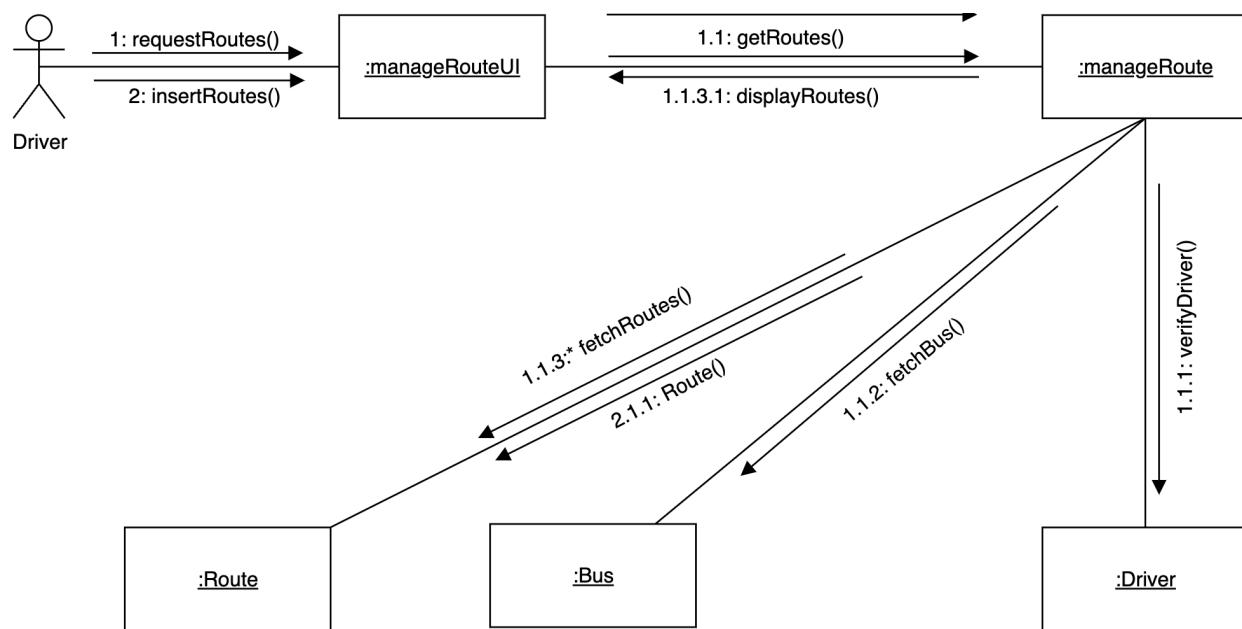


Figure 22 Collaboration Diagram - manageRoute

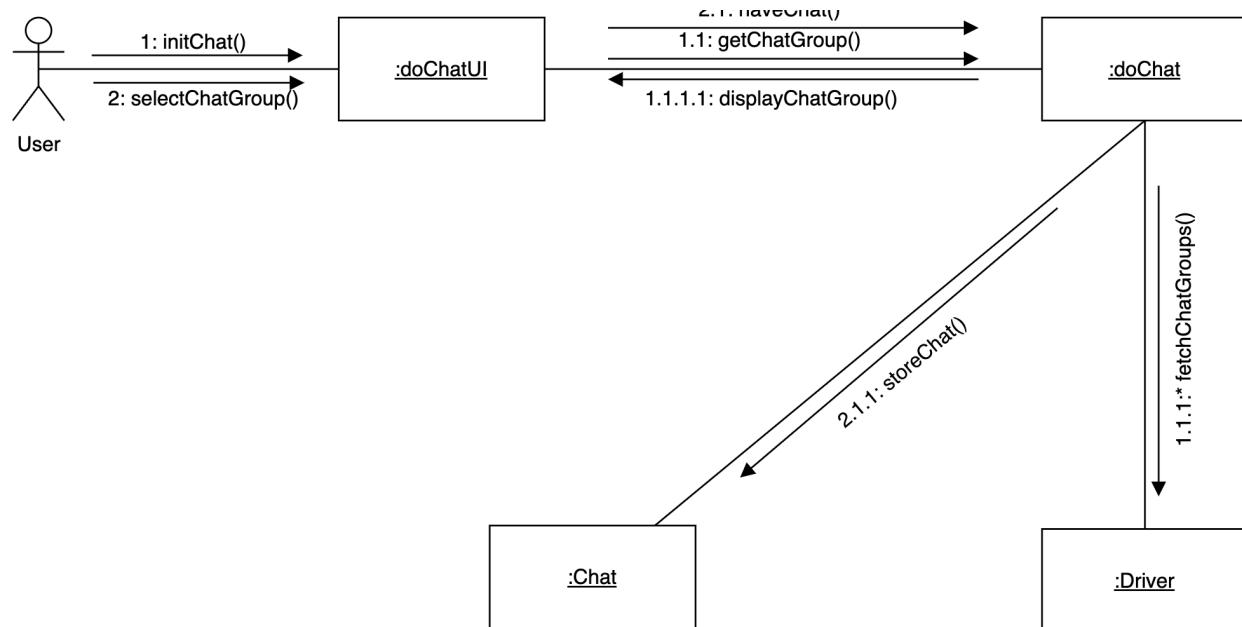
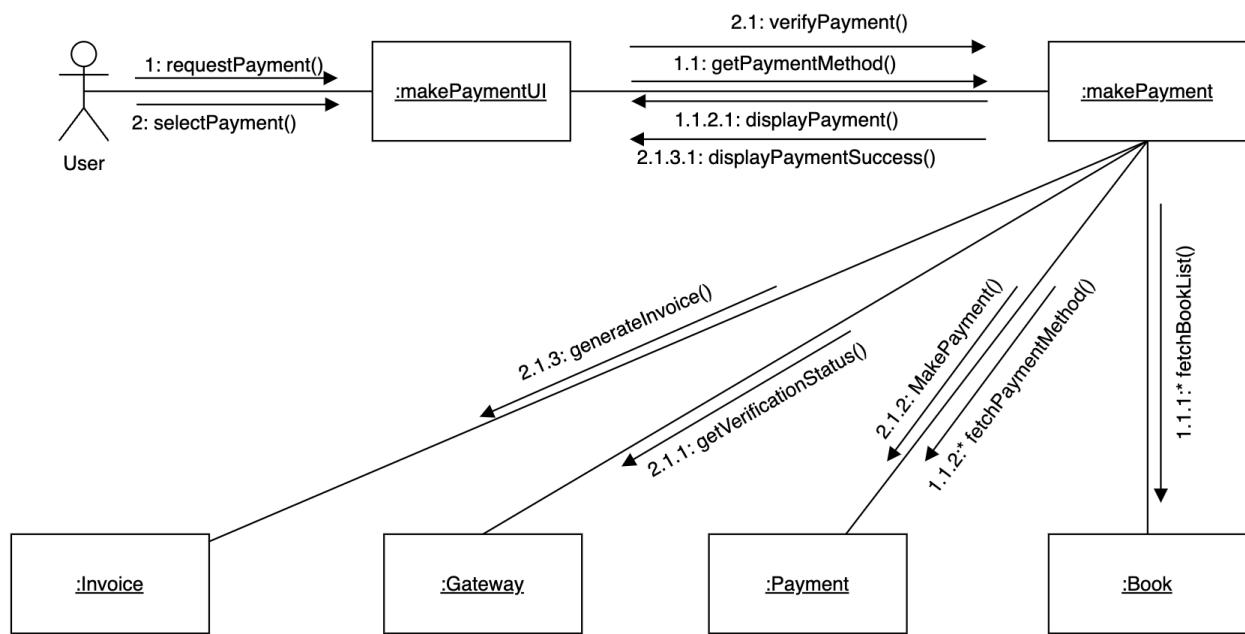


Figure 23 Collaboration Diagram – doChat

Figure 24 Collaboration Diagram – *makePayment*

9.4 Sequence Diagram

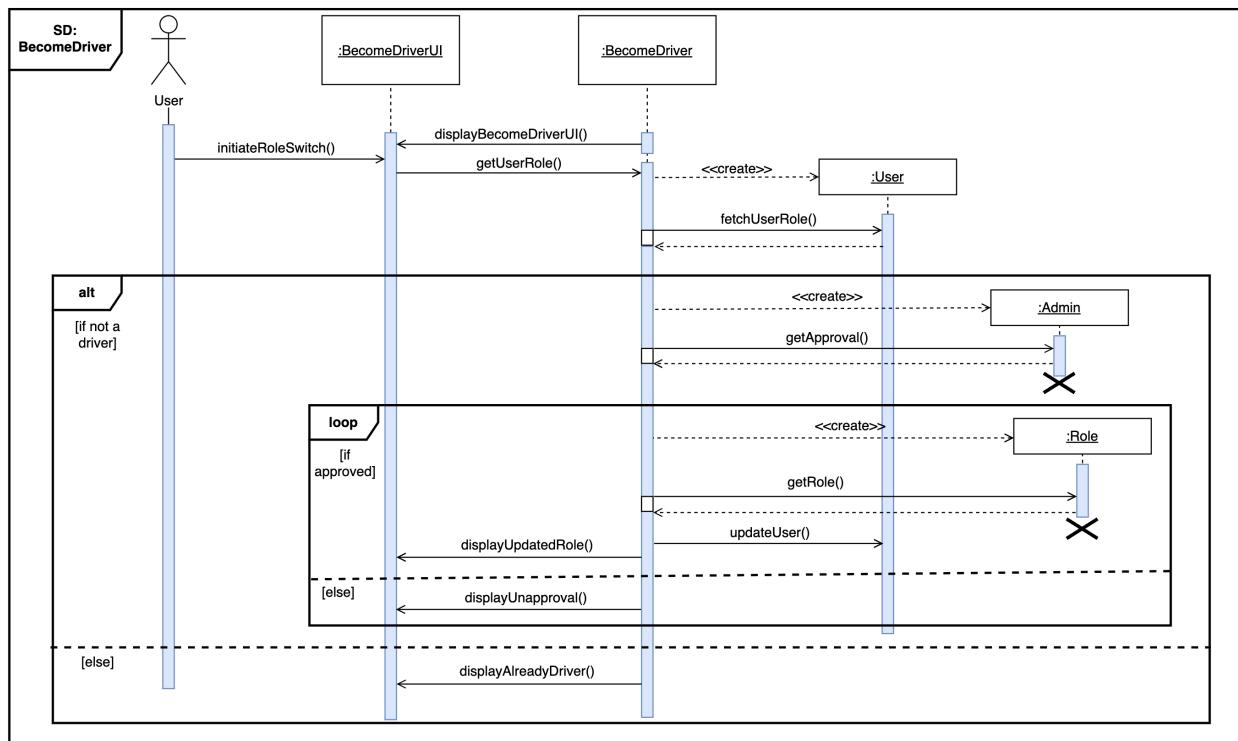


Figure 25 Sequence Diagram - BecomeDriver

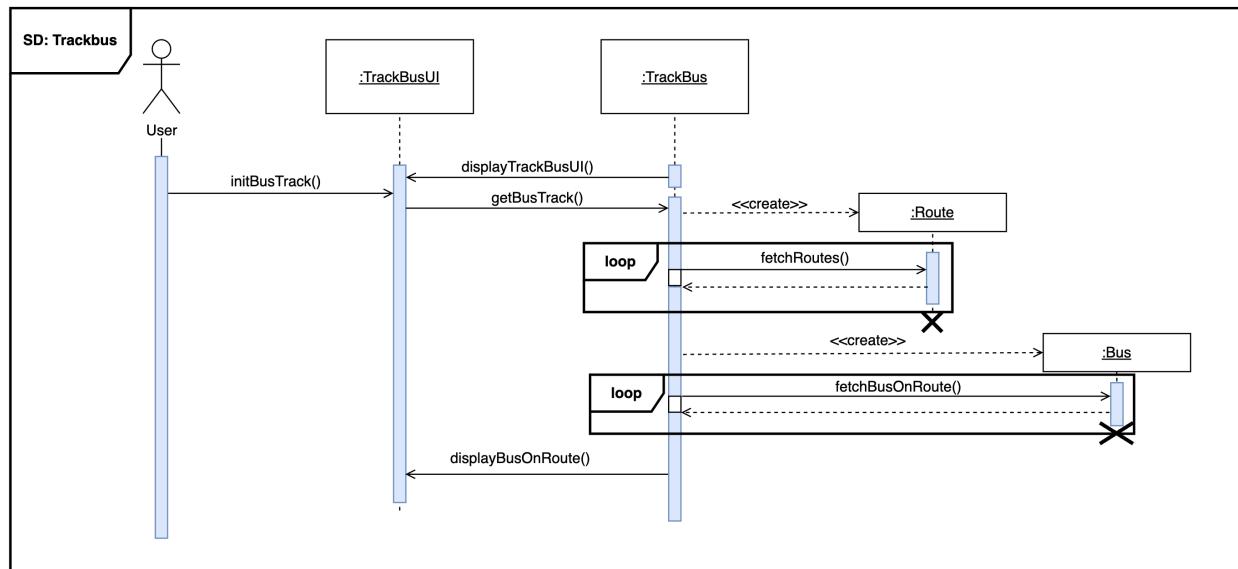


Figure 26 Sequence Diagram - TrackBus

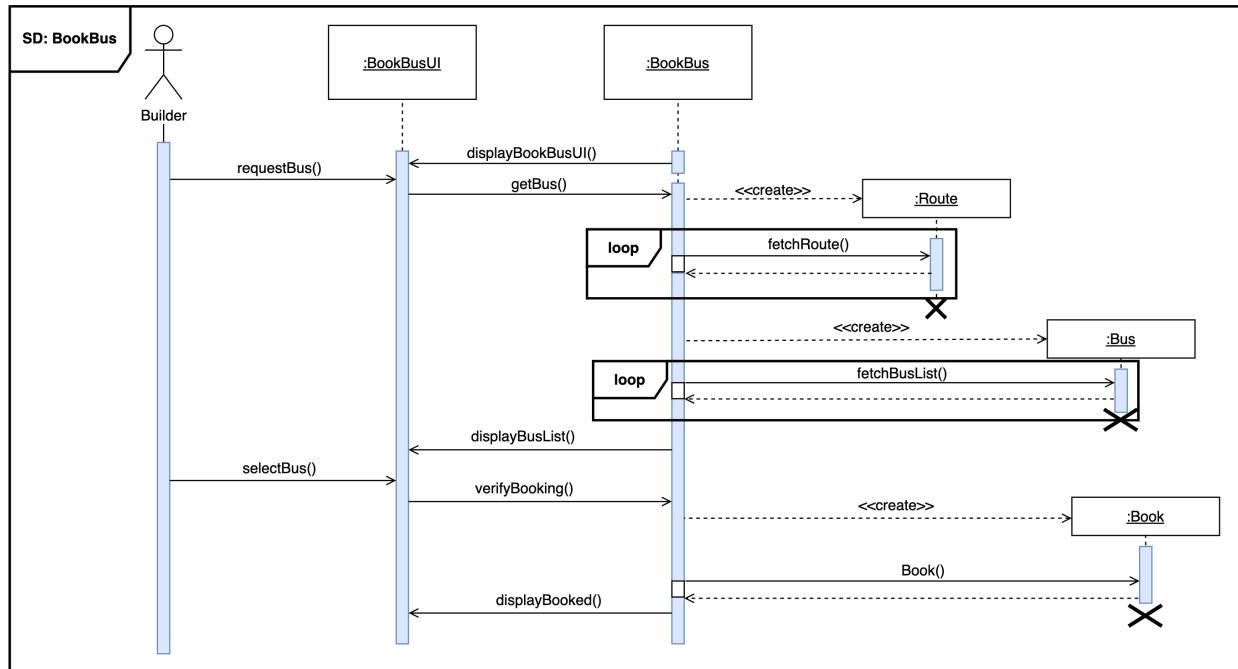


Figure 27 Sequence Diagram - BookBus

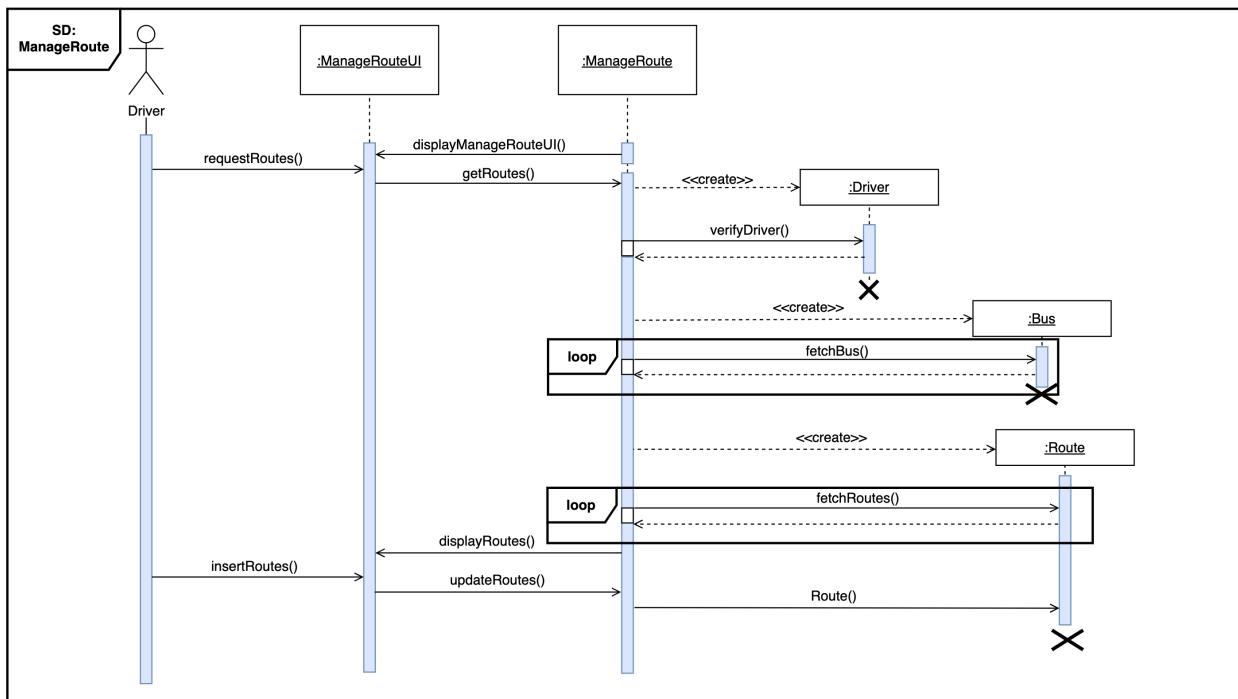


Figure 28 Sequence Diagram - ManageRoute

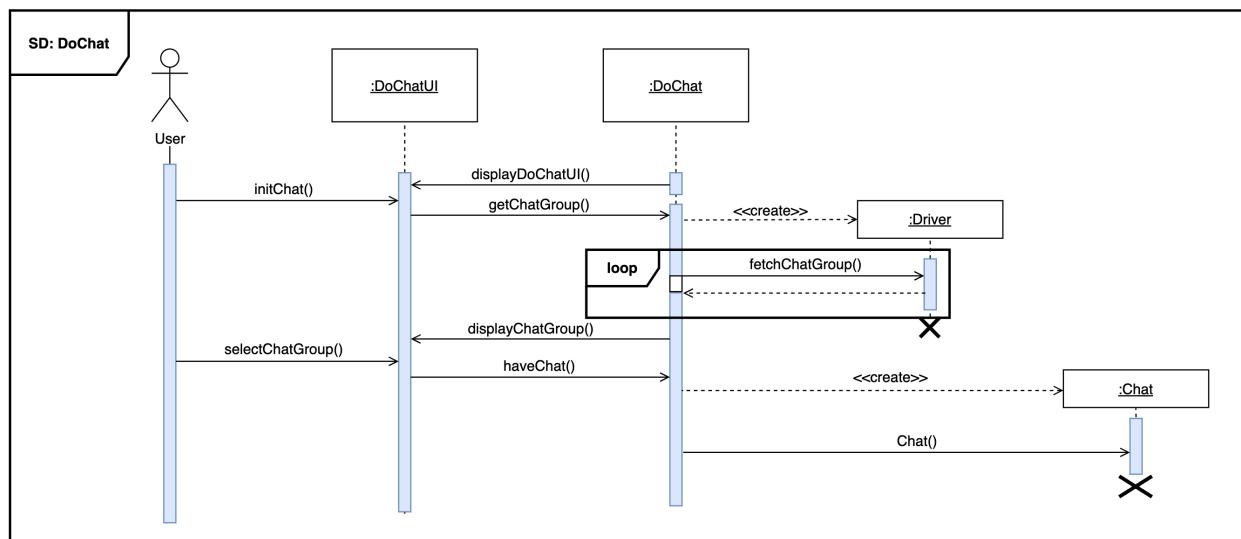


Figure 29 Sequence Diagram - DoChat

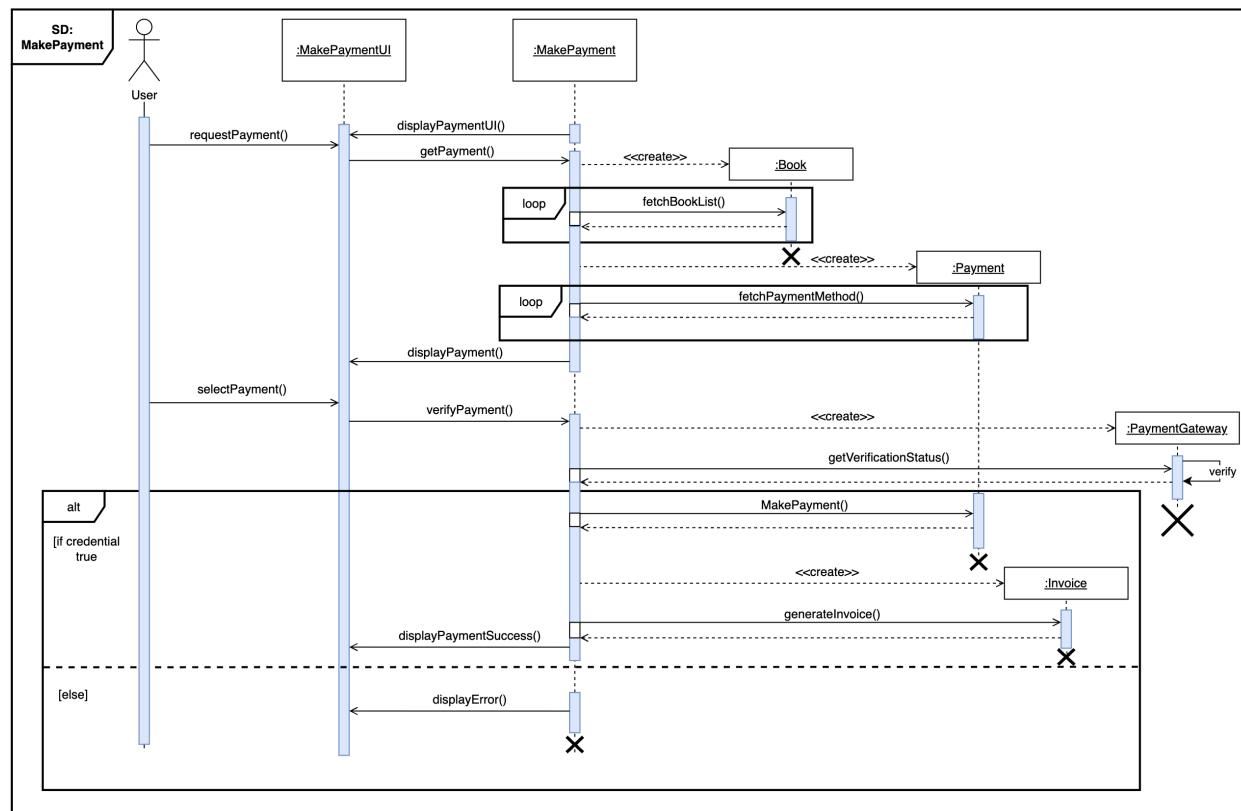


Figure 30 Sequence Diagram – MakePayment

9.5 Data flow diagram

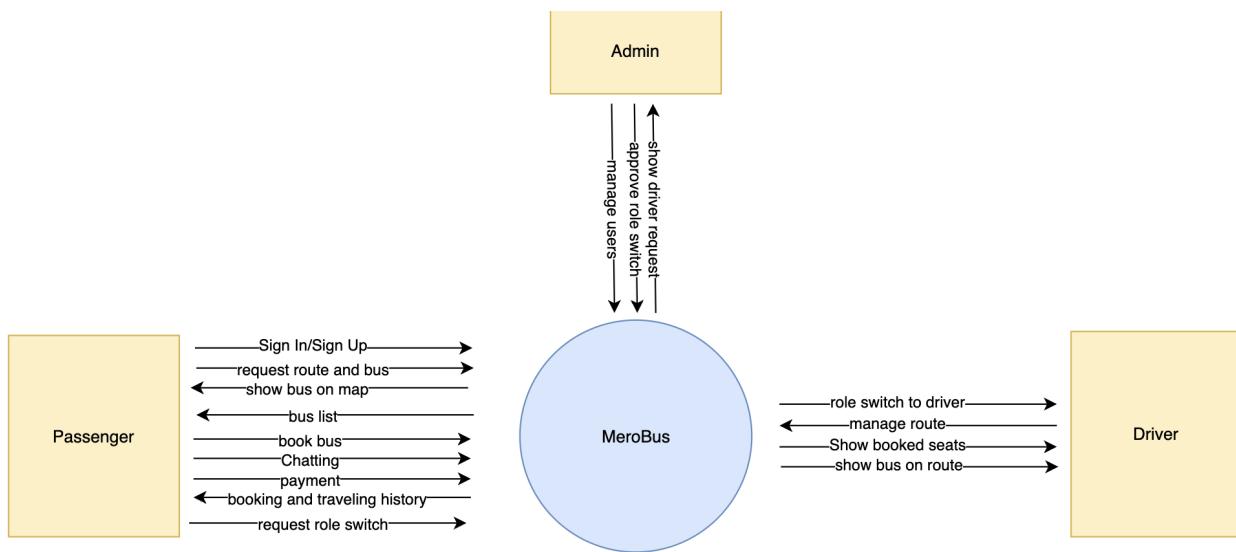


Figure 31 Data flow Diagram - Level 0

9.6 Wireframe

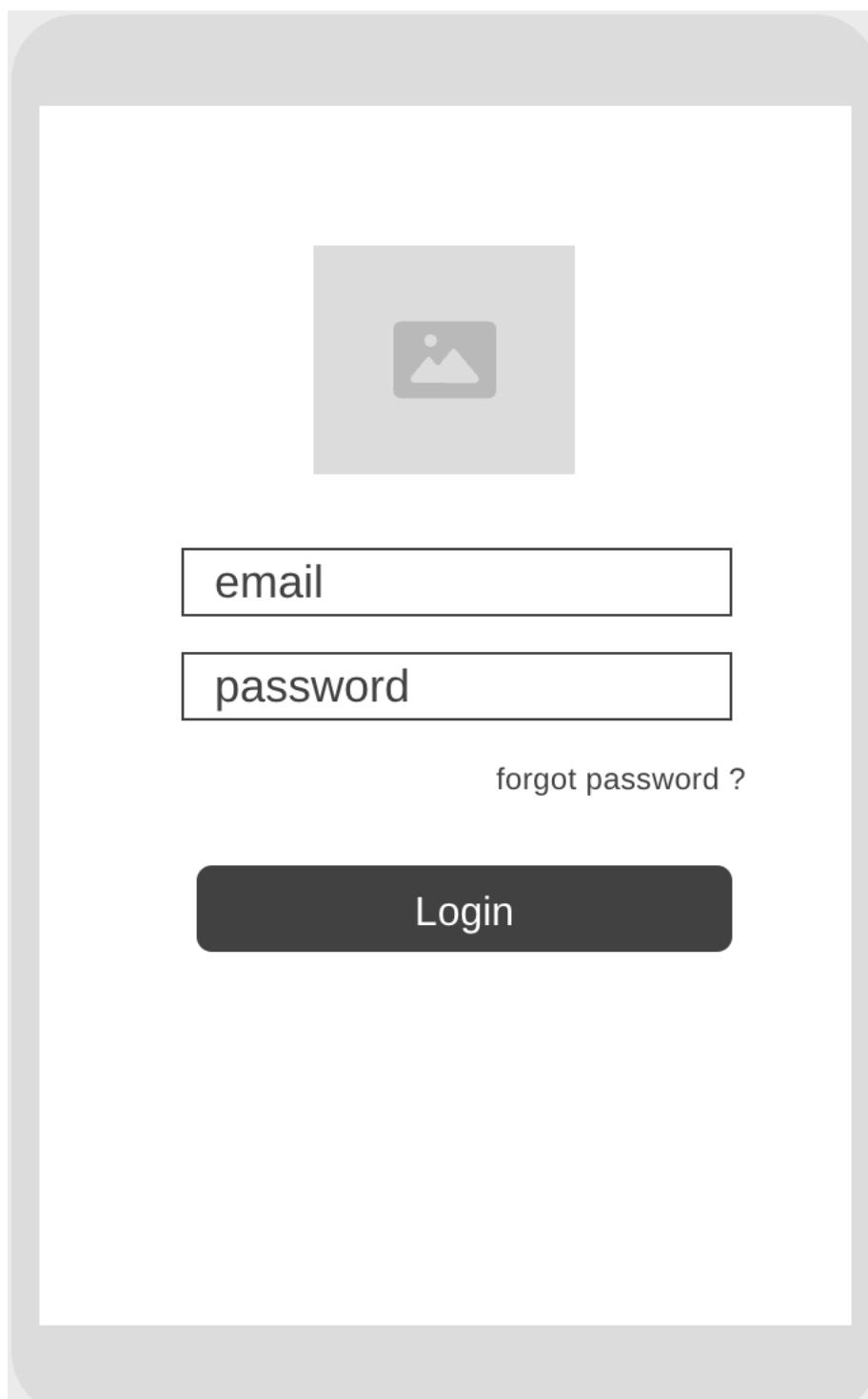


Figure 32 Wireframe - Login

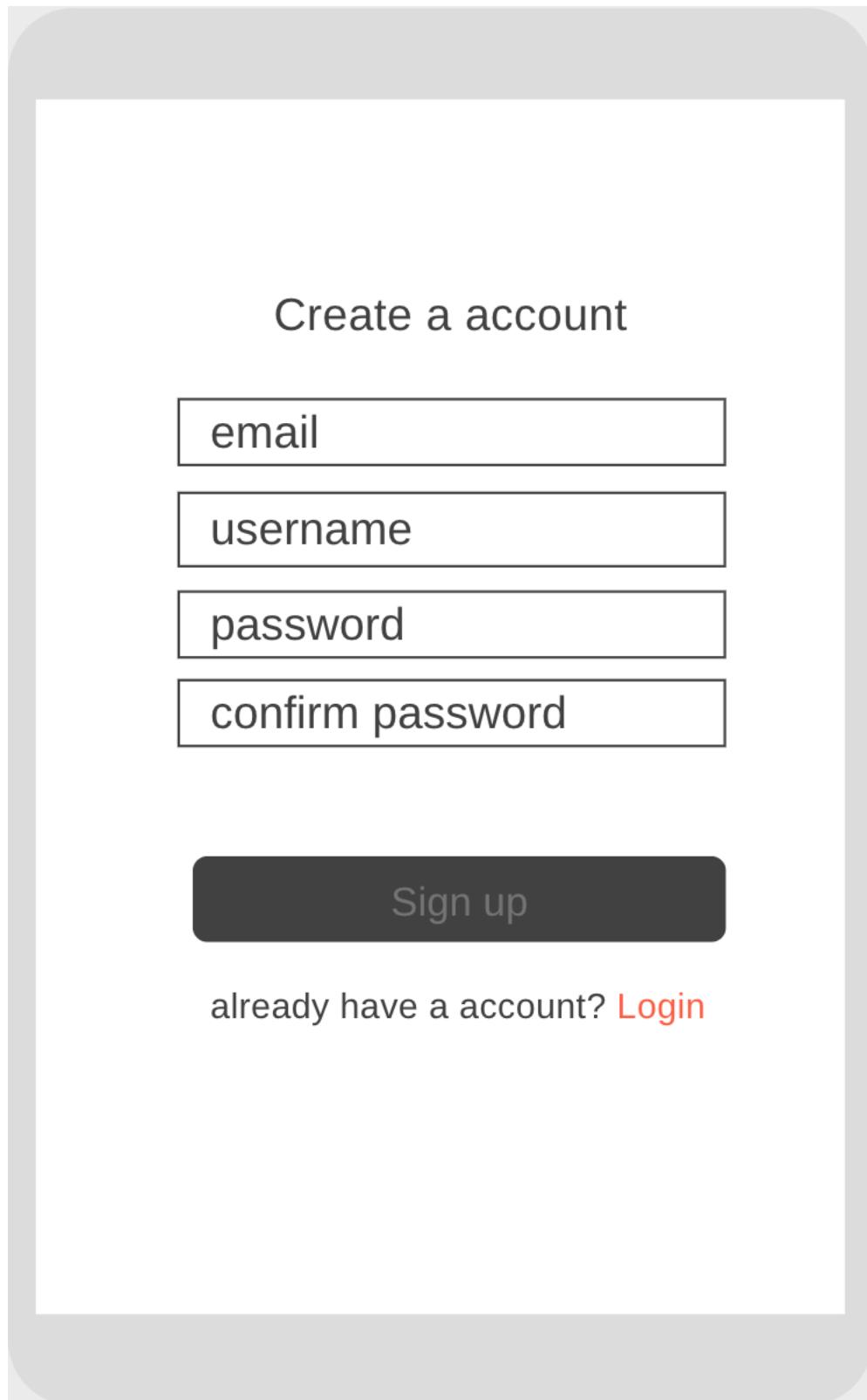


Figure 33 Wireframe - Register

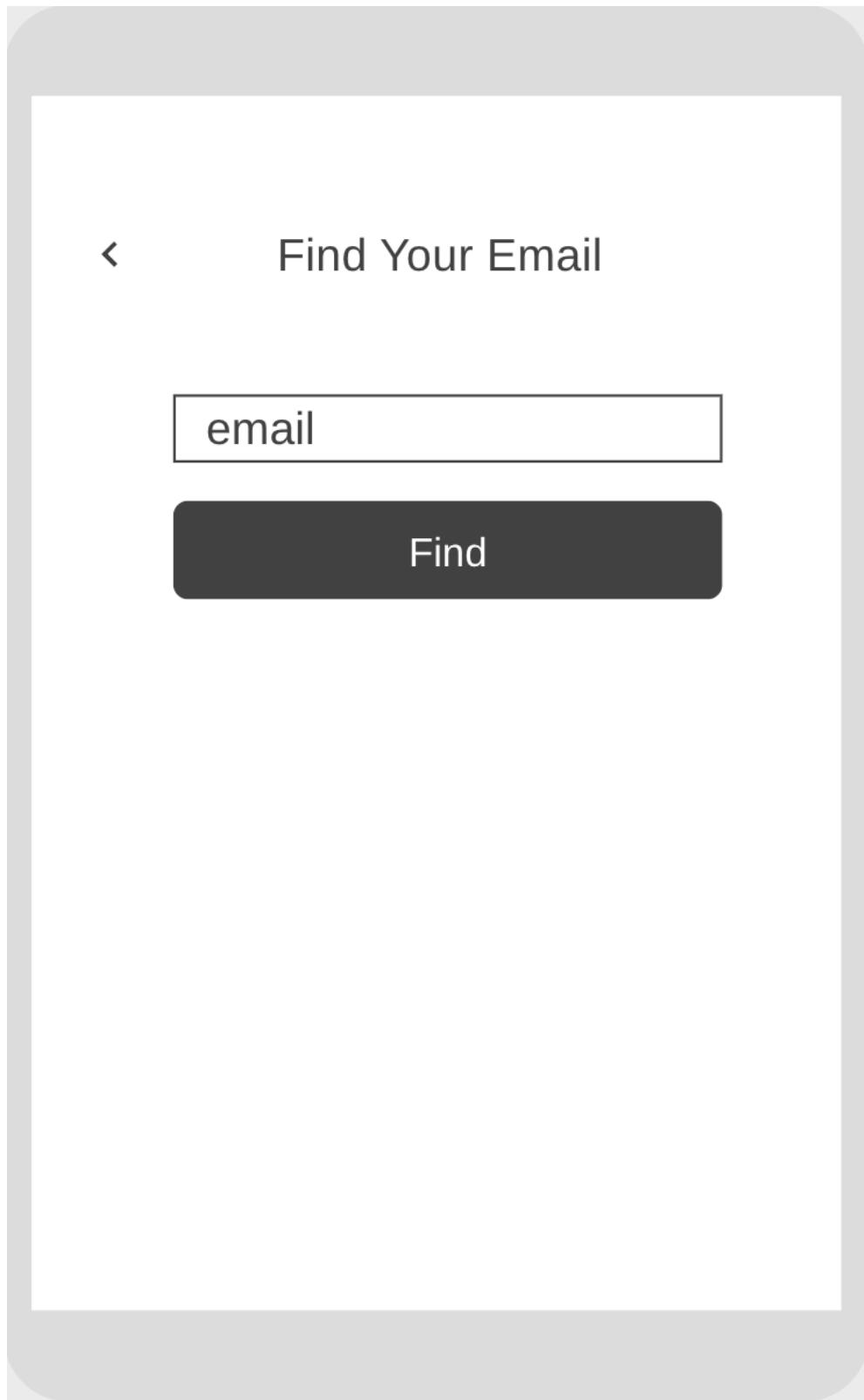


Figure 34 Wireframe - Forgot password

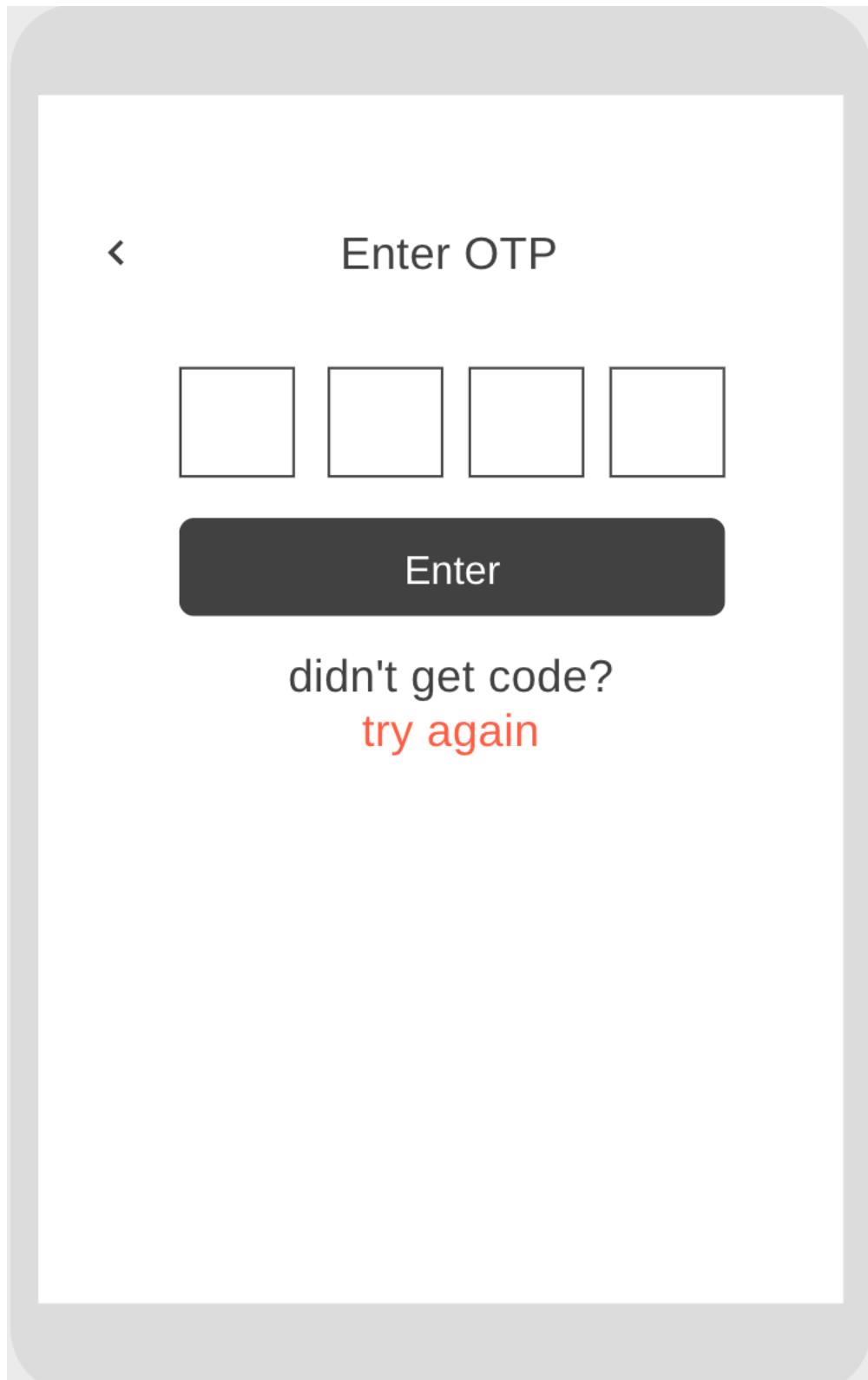


Figure 35 Wireframe - OTP insertion

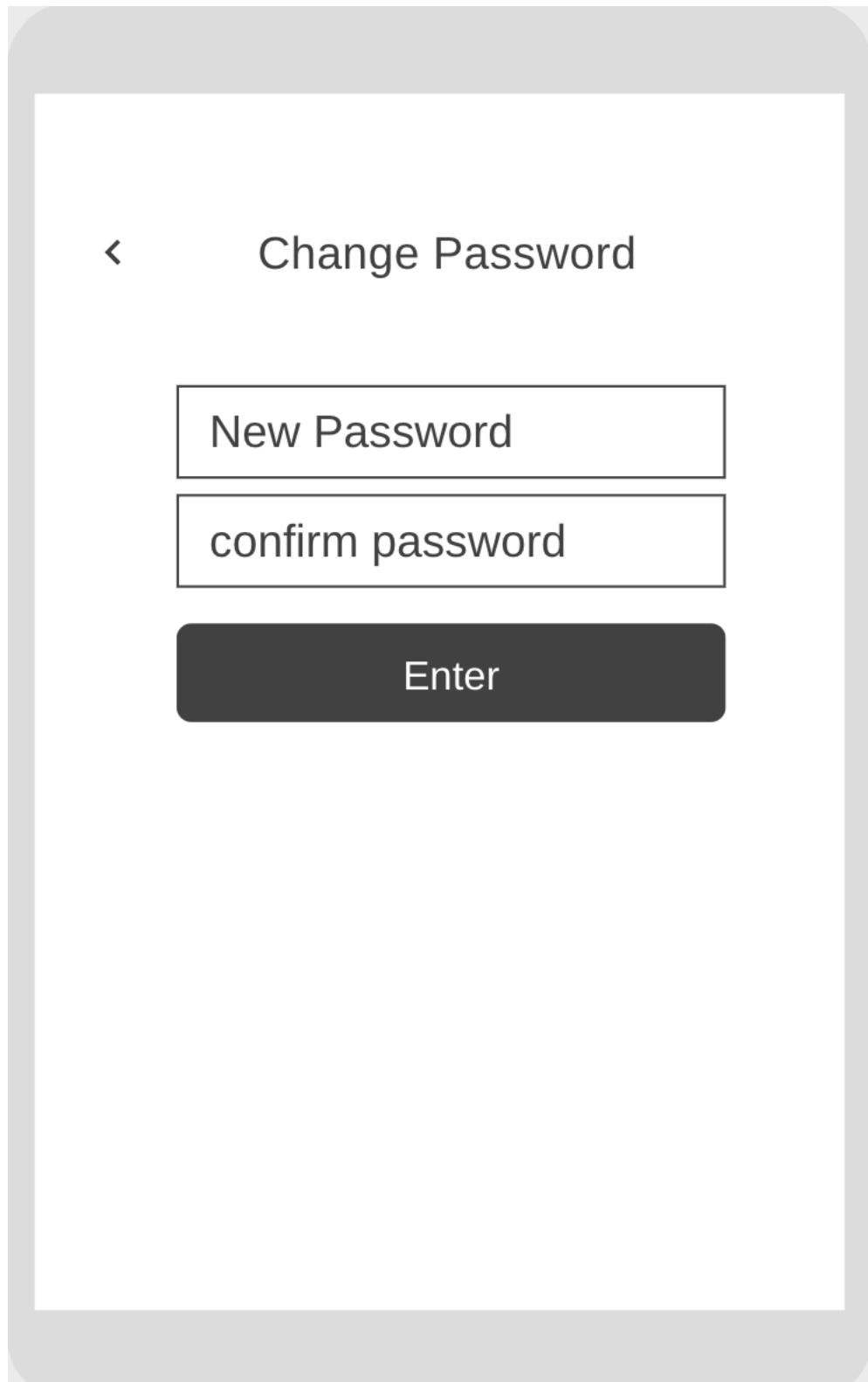


Figure 36 Wireframe - change password

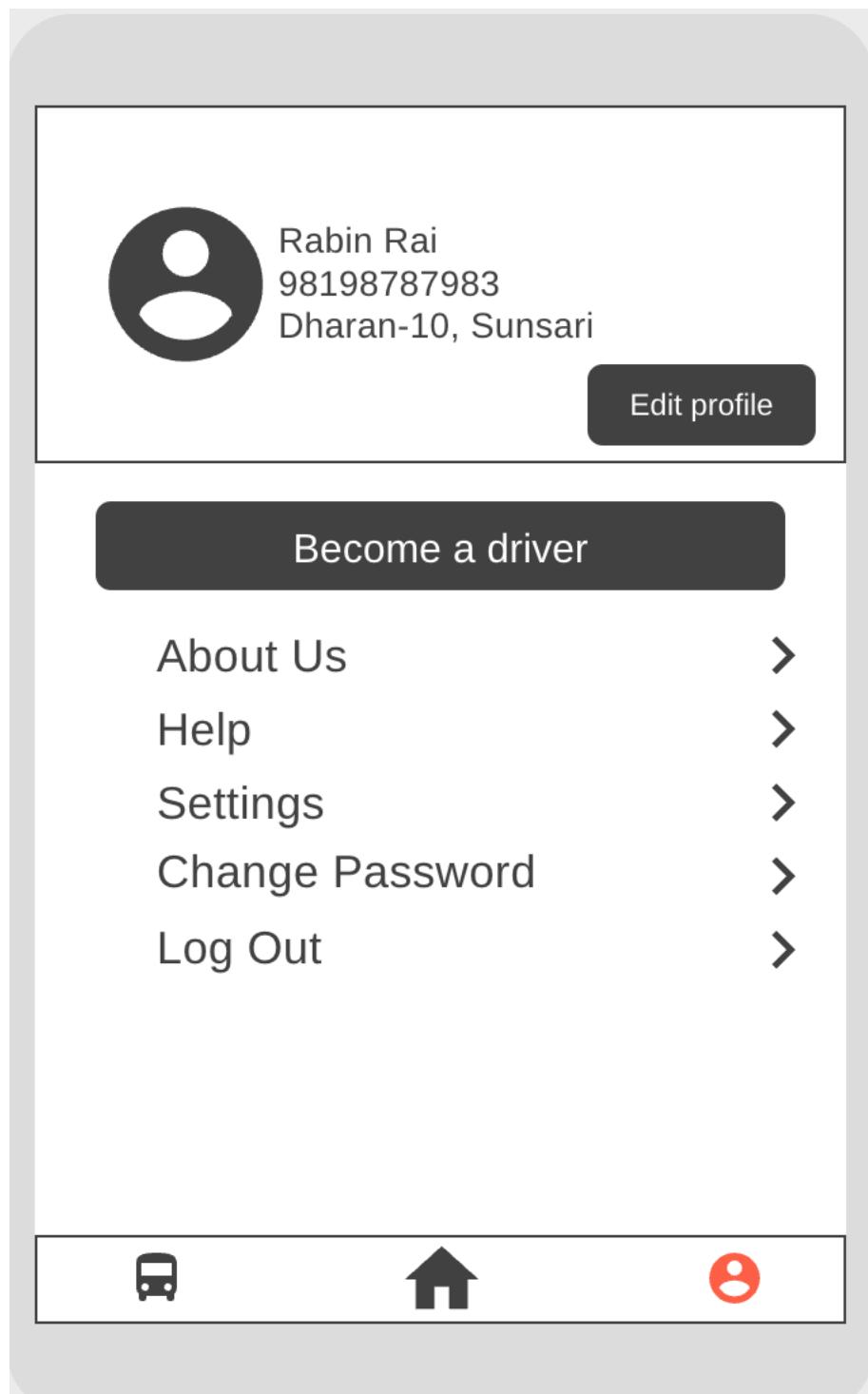


Figure 37 Wireframe - Profile Screen



Figure 38 Wireframe - Map Screen

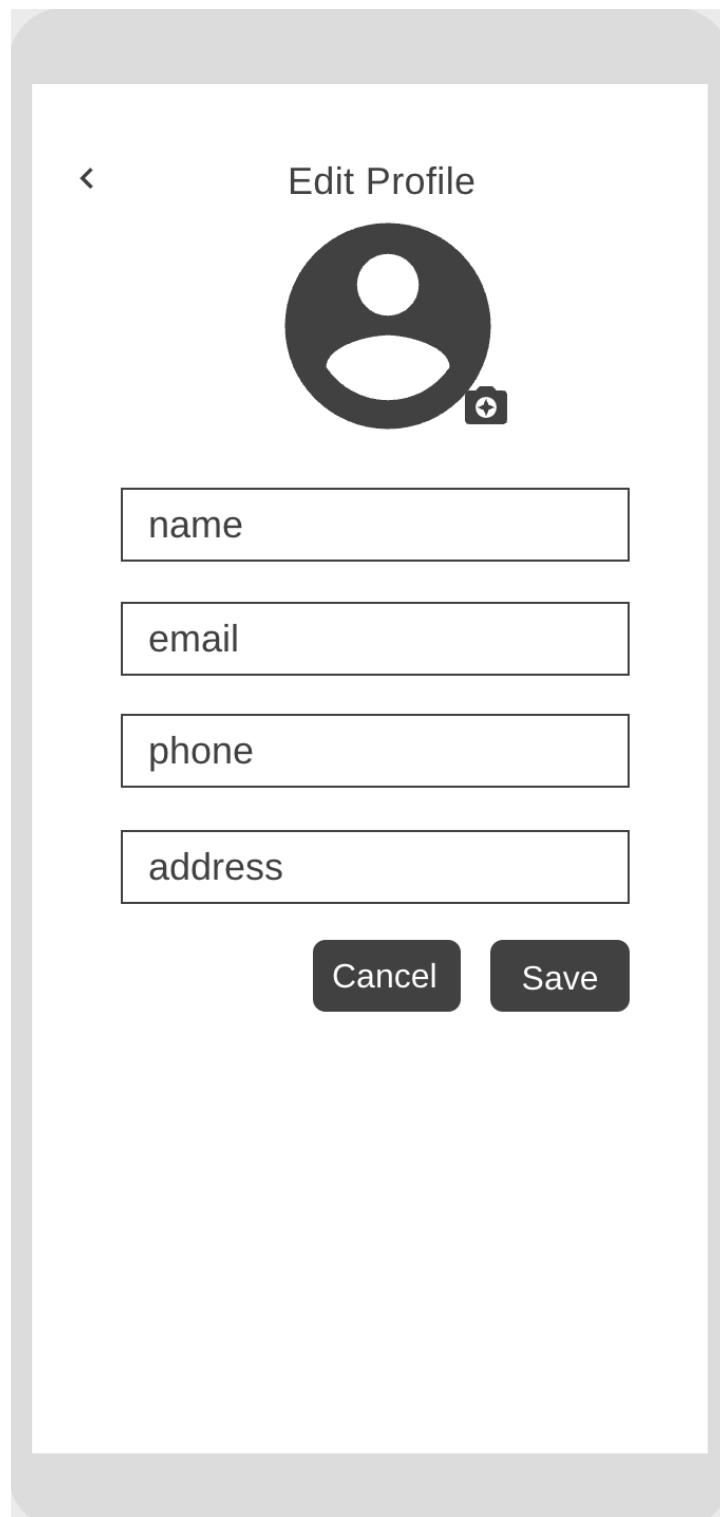
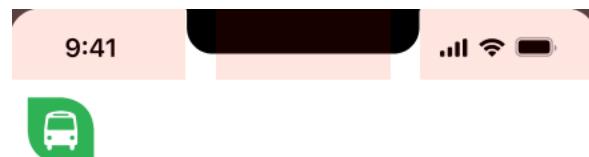


Figure 39 Wireframe - Edit Profile

9.7 UI/UX Design



**Find the exact ride for
your destination**

The location of the bus you
want at your pocket

Sign In

Don't have an account? [Sign Up](#)

Figure 40 UI/UX - Get Started

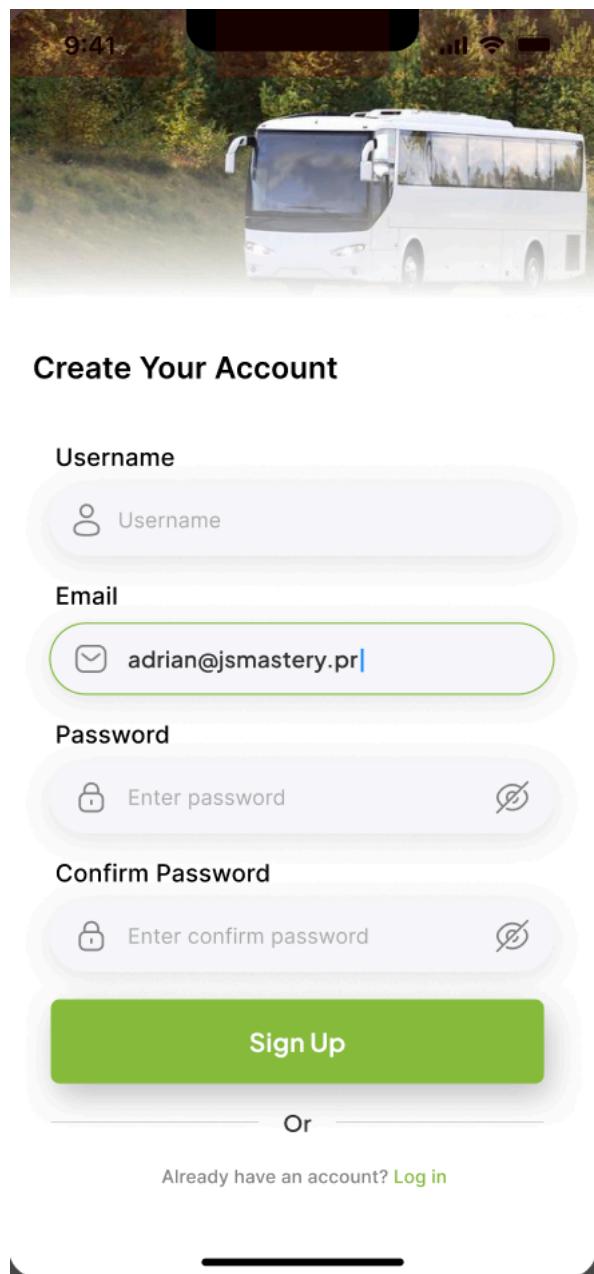


Figure 41 UI/UX - Register

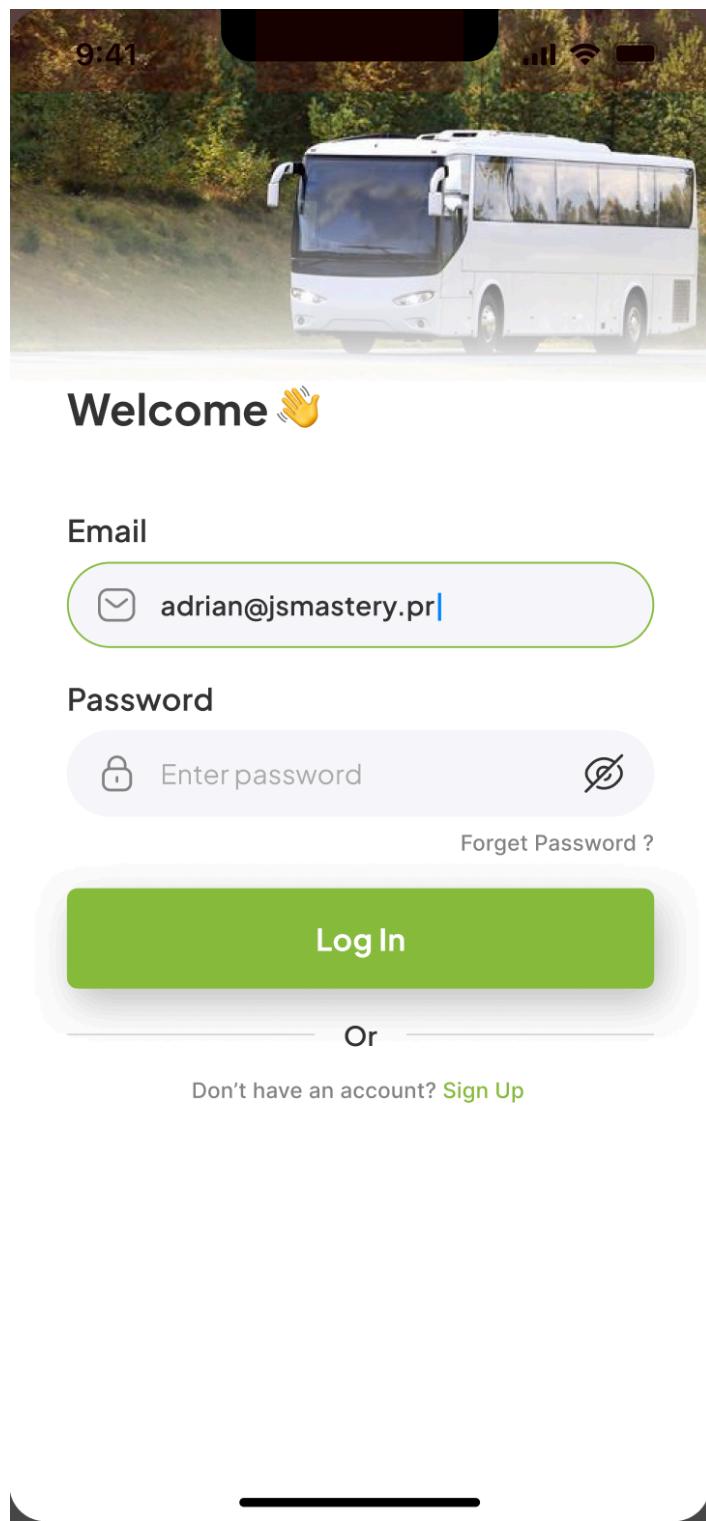


Figure 42 UI/UX - Login

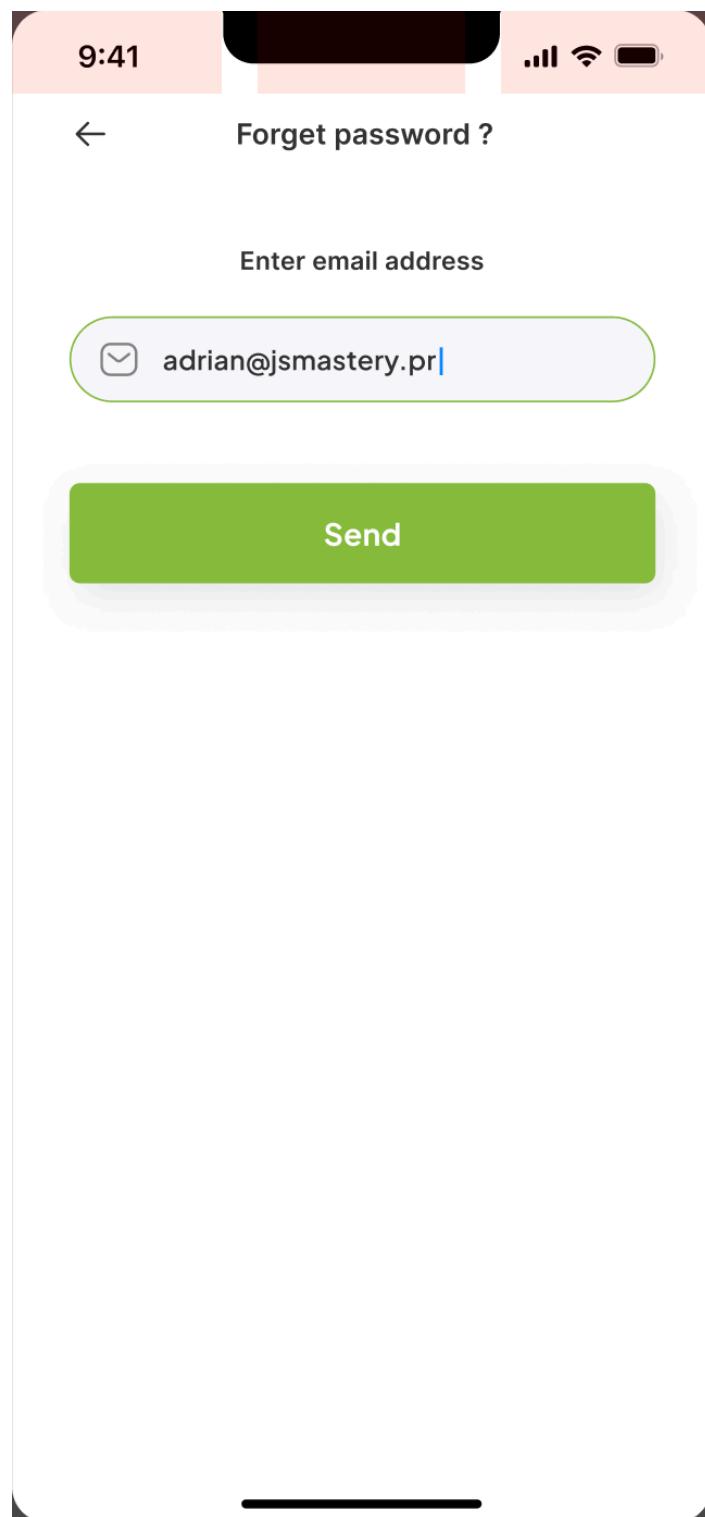


Figure 43 UI/UX - Forgot Password

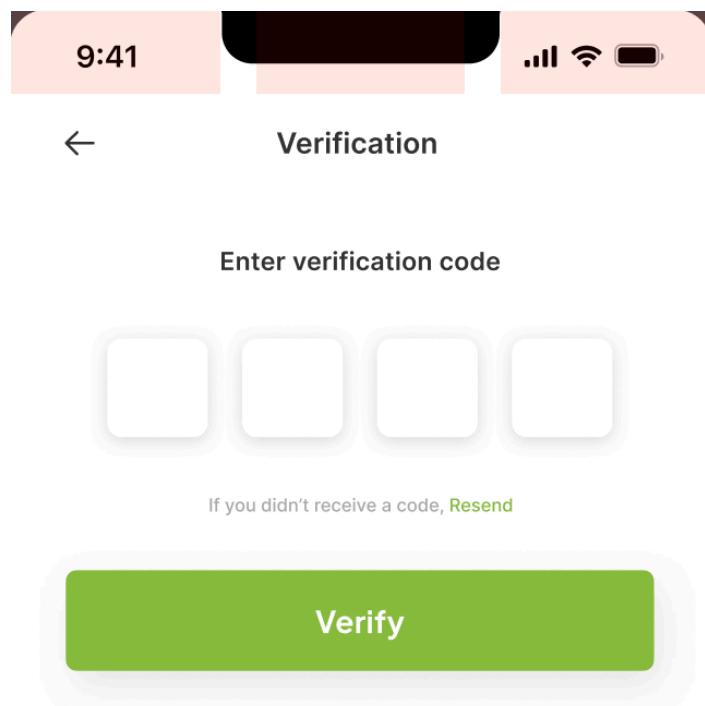


Figure 44 UI/UX - Verify OPT

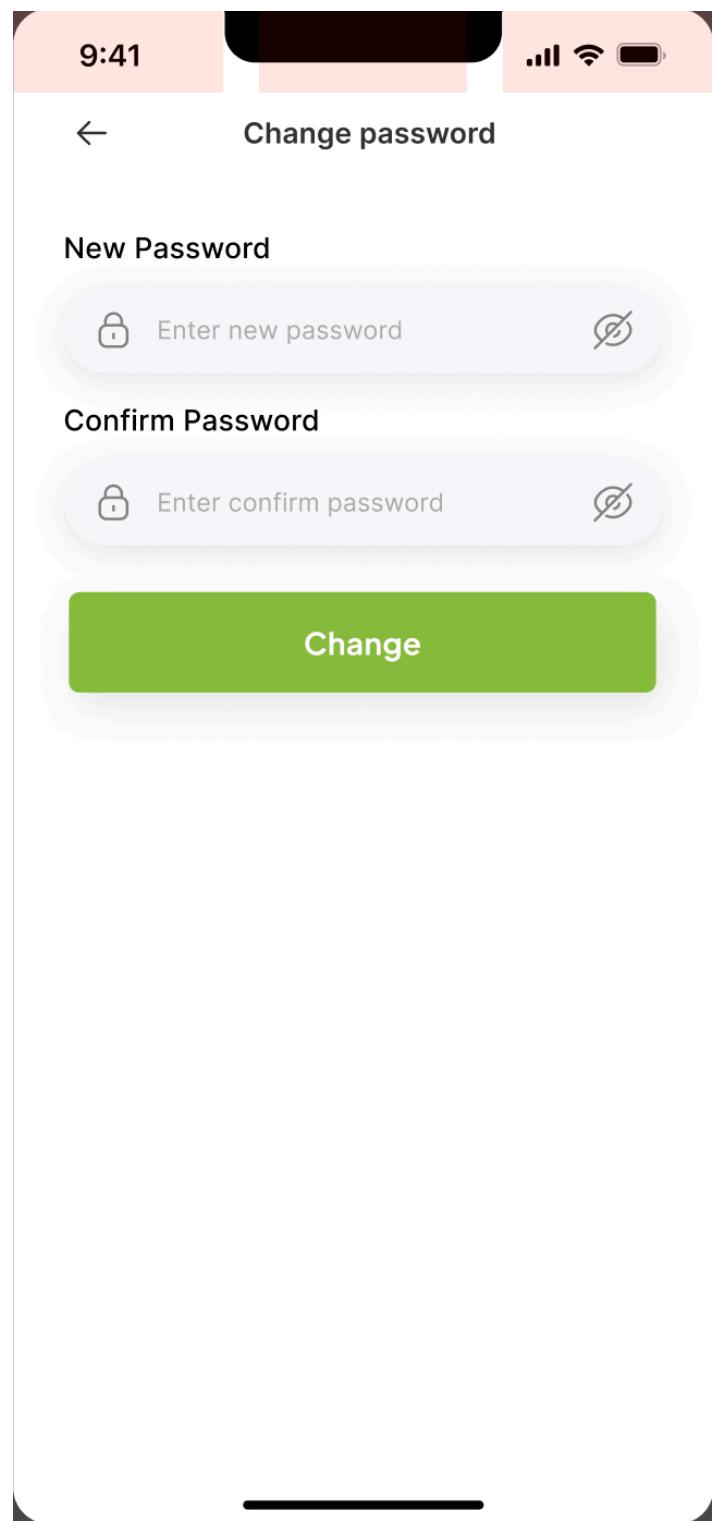


Figure 45 UI/UX - Change password

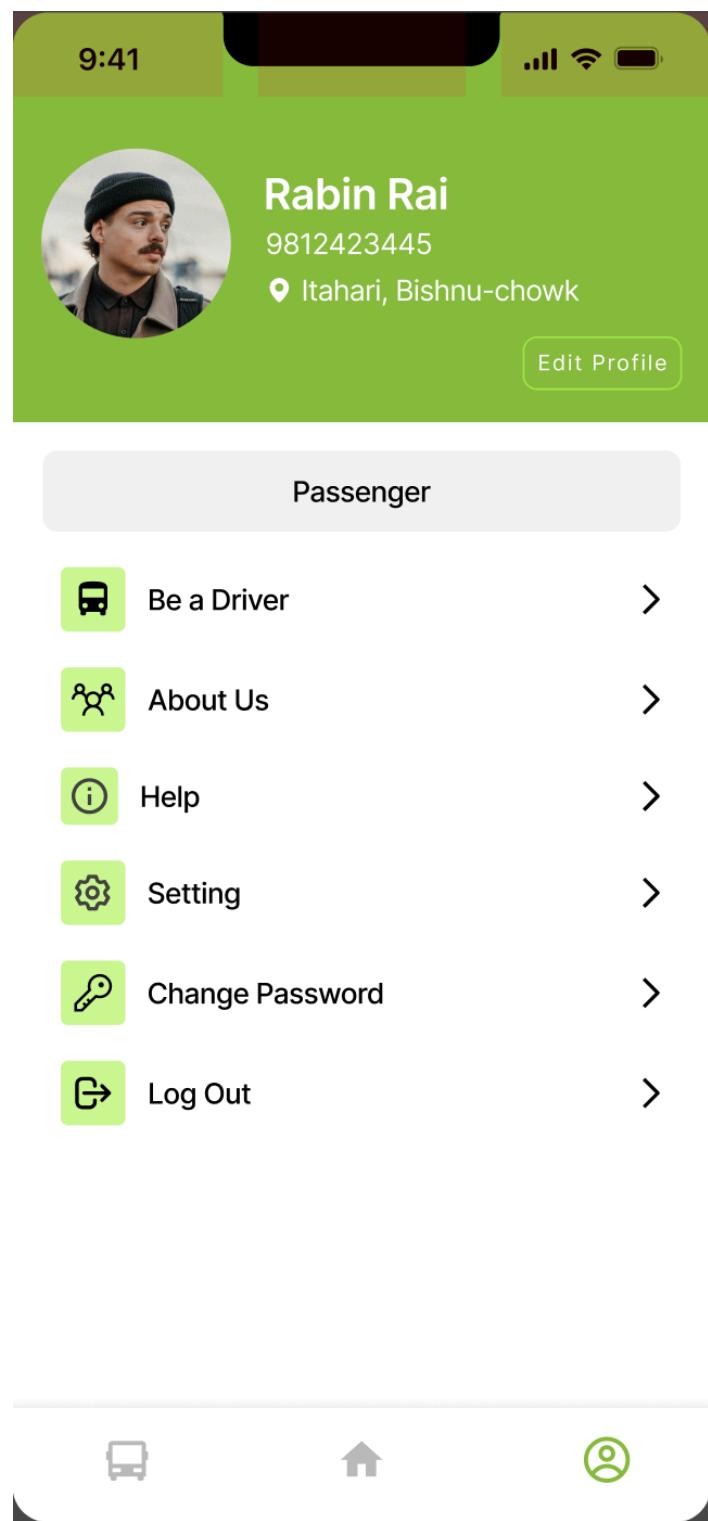


Figure 46 UI/UX - Profile

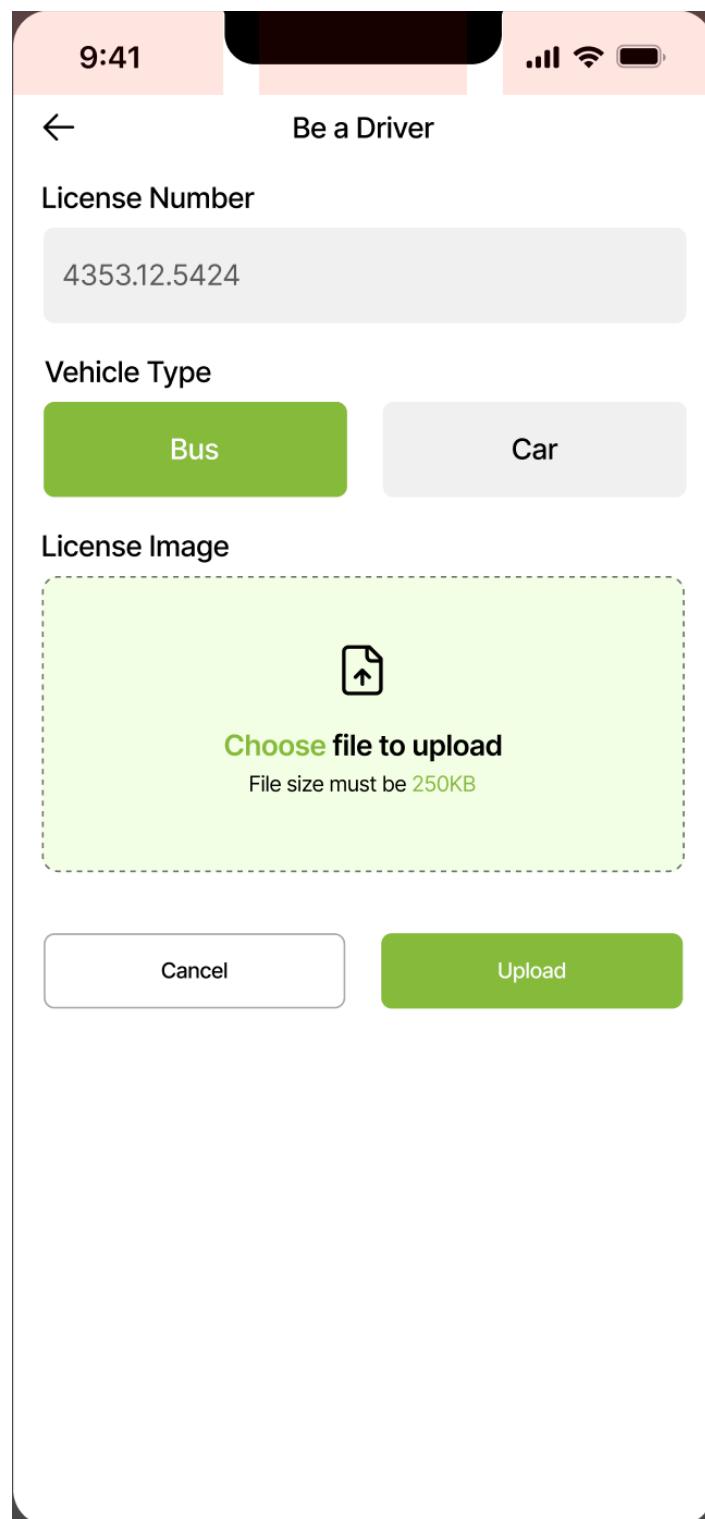


Figure 47 UI/UX - Be Driver

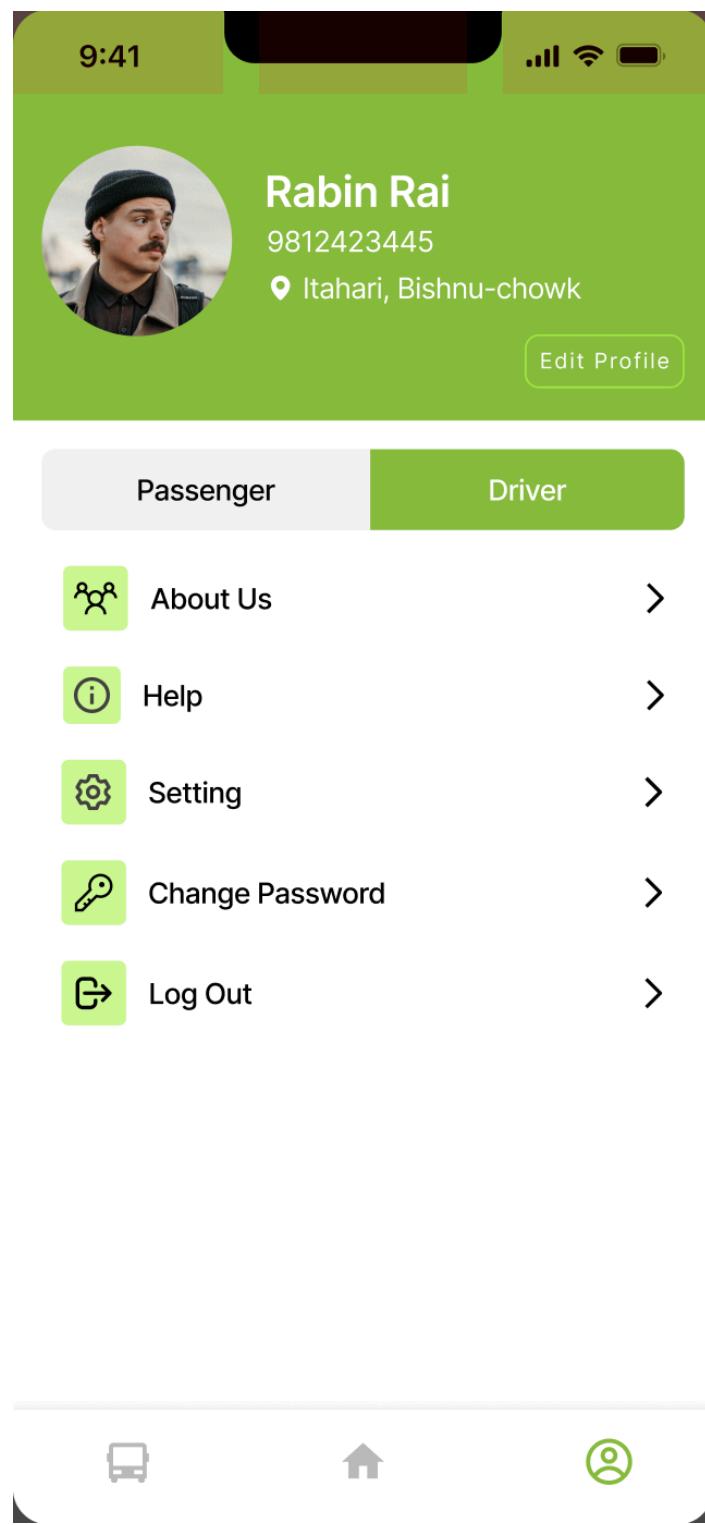


Figure 48 UI/UX - After Role Switch

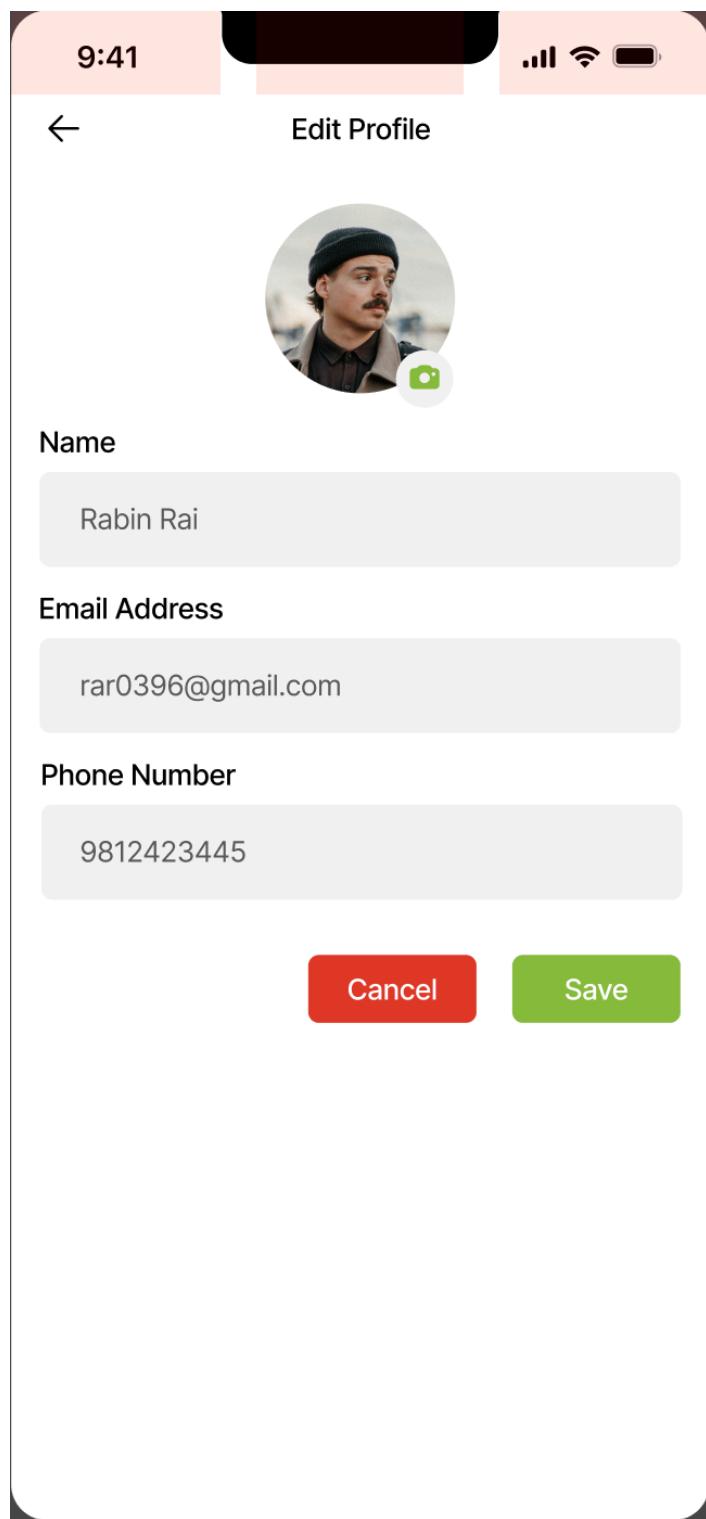


Figure 49 UI/UX - Edit Profile

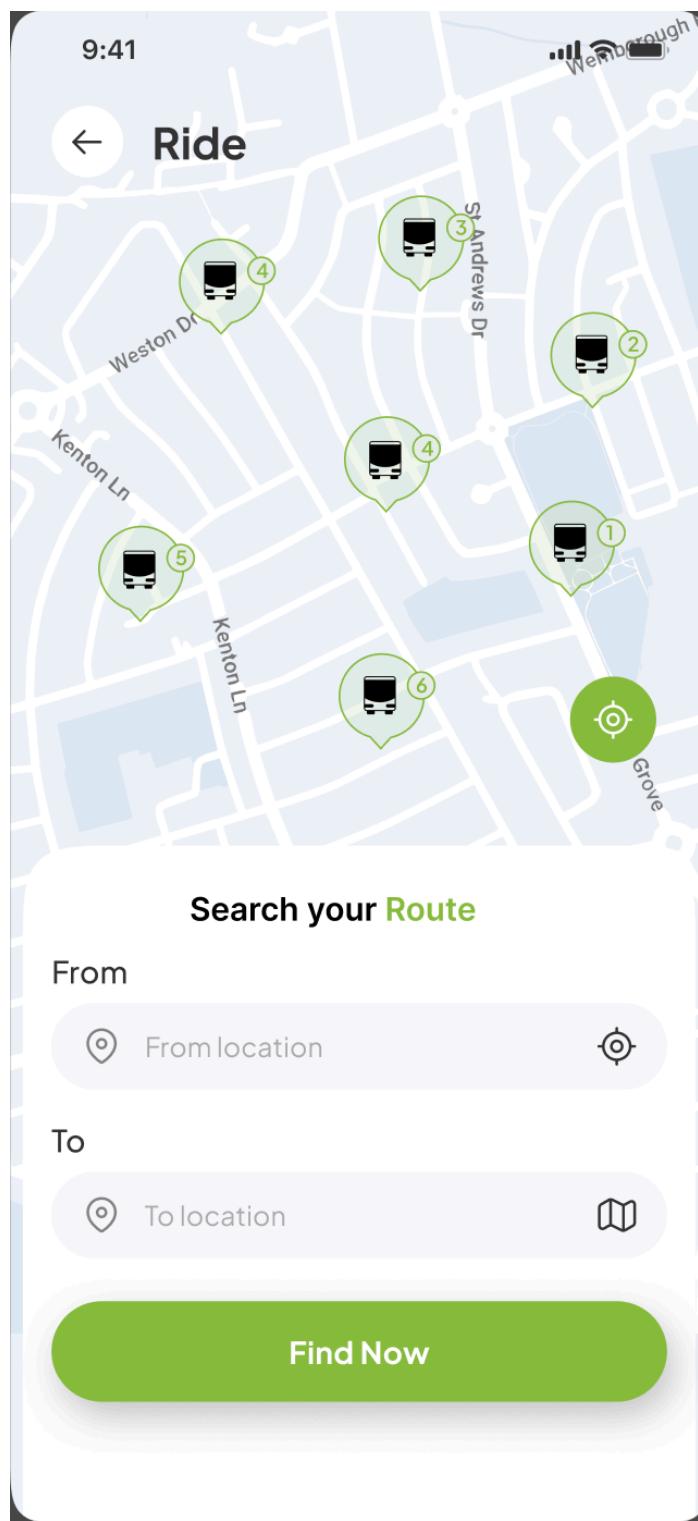


Figure 50 UI/UX - Map

9.8 SRS

9.8.1 Introduction

The purpose of this Software Requirements Specification (SRS) is to define the functional and non-functional requirements for a public transportation app i.e. MeroBus. The fitness app targets a broad audience, from beginners to experienced athletes, and offers diverse functionalities to accommodate various fitness objectives. Available on Android platforms, the app will emphasize user-friendly navigation and accessibility. This document outlines the app's functional and non-functional requirements, design constraints, system dependencies, and performance expectations. It also provides a framework for testing and evaluation to ensure the app meets quality standards.

9.8.2 Product Description

MeroBus is a mobile application designed to improve the public transportation experience in Nepal by offering real-time tracking of vehicles along with specific routes. This application will provide users with live updates of the vehicles they want to take, enabling them to easily plan their journey. Through this application, the way travelers interact with the transportation system will change, making travel more efficient and reliable. MeroBus aims to enhance the public transportation experience in Nepal with the following key features:

Live bus tracking: Users will be able to see live updates of buses and other vehicles along their designated routes, ensuring they know the exact location and estimated arrival times.

Bus booking: Users will be able to book seats on the vehicle for long routes.

Chat: Passengers can chat with each other using the group of the driver.

Payment: Users can make Payment for booked seats.

9.8.3 User Requirements

The MeroBus app will be designed to meet the following functional and non-functional requirements:

9.8.3.1 Functional Requirements

Table 3 Functional Requirement

S.N.	Function and Sub Functions	Description
1	Authentication and Authorization	
1.1	Signup	User should be able to Sign up to get their own account.
1.2	Login	User should be able to Login using their credential.
1.3	Reset Password	User should be able to reset password in case they forgot the password.
2	Map Integration and Location tracking	User should be able to view map and find any location.
3	Driver details verification	Admin should be able to verify the details of users for becoming driver.
4.	Driver details display in map	The application should be able to display the drivers in the map when user requests.
5.	Rate driver and application	The users should be able to rate the driver and the application.
6.	Payment	The users should be able to perform payment when booking the bus.
7.	Chatting between users	The users should be able to chat with other users.
8.	Bus booking	The users should be able to book bus.

9.	Live bus tracking	The users should be able to view live updates on the bus location.
----	--------------------------	--

9.8.3.2 Non-Functional Requirements

Scalability: The System should be able to handle the increased load, including a growing number of users.

Maintainability: The system should be easy to maintain and update

Usability: The UI should be easy to user-friendly, and easy to navigate, ensuring a seamless user experience.

Security: The system and its data should be protected from unauthorized access, breaches, and attacks. User data and passwords should be encrypted

9.8.4 System Requirements

The fitness app will require the following hardware, software, and infrastructure to operate effectively:

9.8.4.1 Hardware Requirements

1. Laptop
2. Mobile

9.8.4.2 Software Requirements

Development tools

1. Xcode
2. Visual Studio Code
3. GitHub
4. Figma

Backend Development

1. NodeJS
2. Socket.io

Database

1. MySQL
2. Prisma

API and Testing

1. Map API
2. Postman

Frontend Development

1. Flutter

Packages

1. Flutter Map – Flutter package to integrate map in the project project.

2. Flutter screen-utils – Flutter package to make flutter package responsive on every screen size.
3. Riverpod – A state management tool.
4. Http – A routing package to connect to the API.
5. Gorouter - A router package for routing between the screens.
6. Permission handler – A package of flutter for handling the permission.
7. Shared Preferences – A package of flutter for storing data locally.
8. Jwt Decoder – A library for encoding and decoding Jwt tokens.
9. NodeMailer – A library for sending mail.