Department of Computer Science and Engineering East West University

Project Report
of
BIKE RENTAL SYSTEM

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Submitted To-

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Bike Rental System

1. Introduction

To reduce Dhaka city's pollution, the city corporation wants to facilitate the opportunity of bicycling. Users can use a mobile app to easily locate bikes (cycle) on a map and rent for a day. They can also rent a fixed bike for monthly use.

1. Authenticating in the App:
Users can download the bike rental app from the app store on their smartphone. They can set up their account, providing necessary details like payment information and identification.

2. Finding the Nearest Bike Pick-up point:
After opening the app, the user uses the map feature to locate the nearest bike pick-up point. The app will display a list of available points, along with the number of bikes at each location.

3. Selecting a Bike:
The user decides to pick up a bike from a pick-up point. She clicks on the location, which shows the available bikes, along with details like bike type, size, and condition. She selects a comfortable city bike.

4. Unlocking the Bike:
Upon arriving at the bike pick-up point, the user uses the app to unlock the selected bike's built-in lock, releasing the bike for her to use.

5. Navigation Assistance:
As the user pedals through the city, the app provides turn-by-turn navigation to her chosen destinations. It suggests bike-friendly routes, ensuring she avoids busy streets and takes advantage of scenic paths.

6. Midway Stop:
If the user decides to take a break on the way, she can locate a nearby bike parking area where she securely lock the bike for a short while. The app also provides an estimated cost for the paused duration.

7. Continuing the Journey:
Resuming her journey, the user unlocks the bike from the parking area and continues exploring the city. The app continues to track her ride duration and cost, updating in real time.

8. Ending the Ride:
After the end of a journey, the user can lock the bike using the app, and leave it in a pick-up point. The app automatically calculates the total cost based on the duration of her ride.

9. Payment and Receipt:
The user reviews the final cost on the app, and the payment is seamlessly deducted from her linked account. The app sends her a digital receipt summarizing the trip details, including time, distance, and cost.

10. Rental for Monthly Use:
Besides the daily or sudden use of bikes, users can also rent a certain bike for a month.

2. Features

1. User Authentication & Login
2. Locate Bike Pick-up Point
3. Select & Unlock Bike
4. Navigation Assistance
5. Midway Stops
6. Continue Journey
7. End Ride
8. Payment & Receipt
9. View profile
10. Tracking
11. Monthly Rental Service

3. Requirements

3.1. Functional Requirements

1. The app should allow users to set up their account.
2. The app should allow users to locate nearest bike pick up point in the map.
3. The app should display list of available points, along with number of bikes.
4. The app should allow users to select a bike from the pickup point.
5. The app should provide details (type, size, condition) of the available bikes
6. The app should allow user to unlock the bike.
7. The app should provide turn-by-turn navigation to users chosen direction
8. The app should suggest bike-friendly routes.
9. The app should allow users to locate nearby parking for taking a break.
10. The app should calculate the estimated cost of the paused duration.
11. The app should update the real time duration and cost time-by-time.
12. The app should allow users to lock the bike.
13. The app should calculate the total cost based on the duration.
14. The app should allow users to review the final cost.
15. The app should send user a digital receipt.
16. The app should allow users to rent a certain bike for a month.

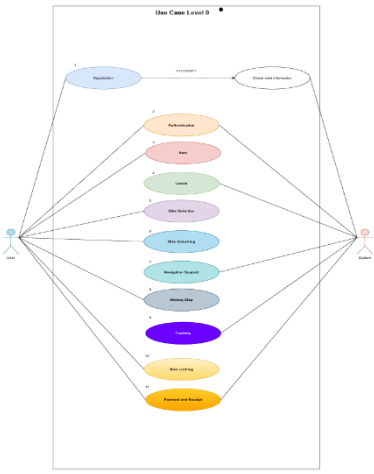
3.2. Non-Functional Requirements

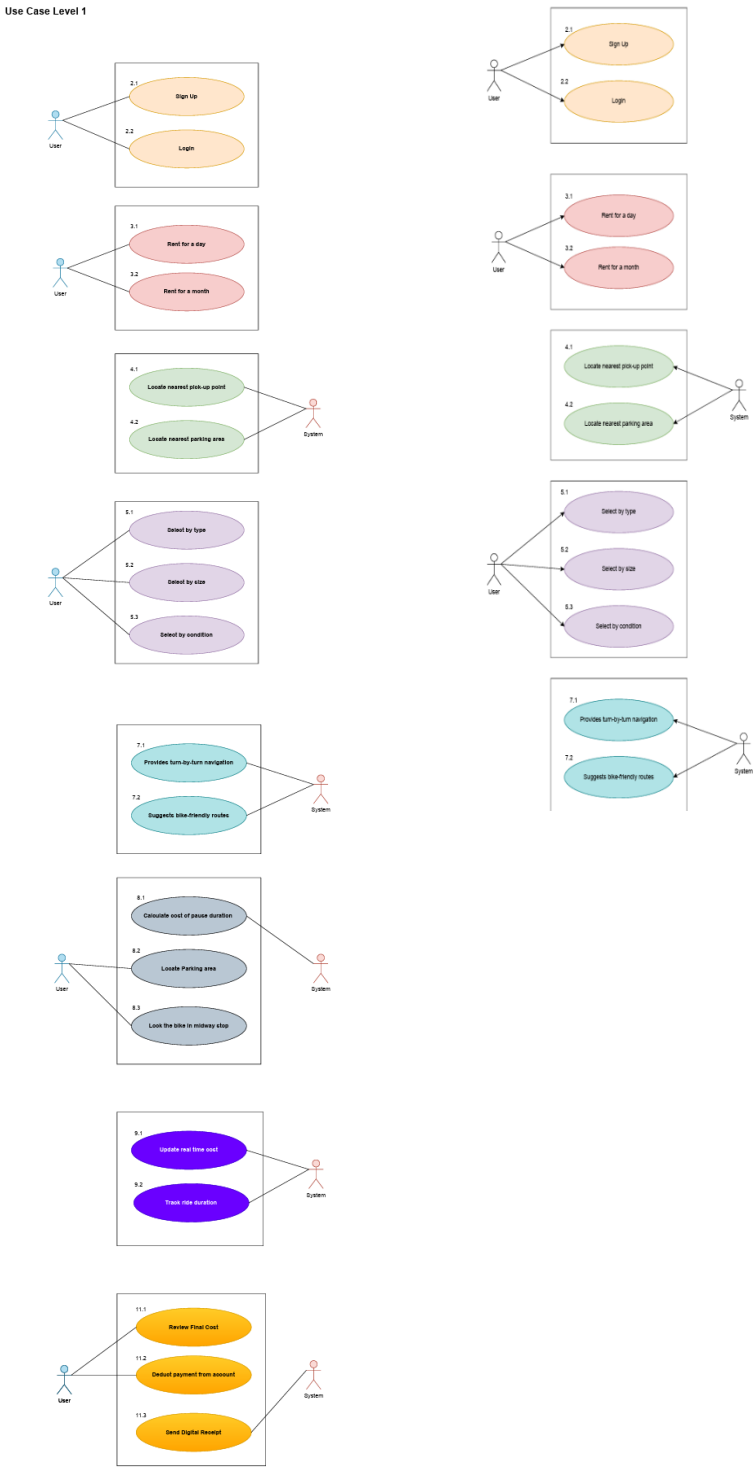
1. **Operational**
    - The app should run on both IOS and Android devices seamlessly.
    - There user interface of the app should be user friendly.
    - The app should support multiple languages to serve more customers around the world.
    - The users should be able to setup their own profile and other settings as per their mind.
2. **Compatibility**

- The app should receive regular updates to stay compatible with the latest Android & IOS versions.

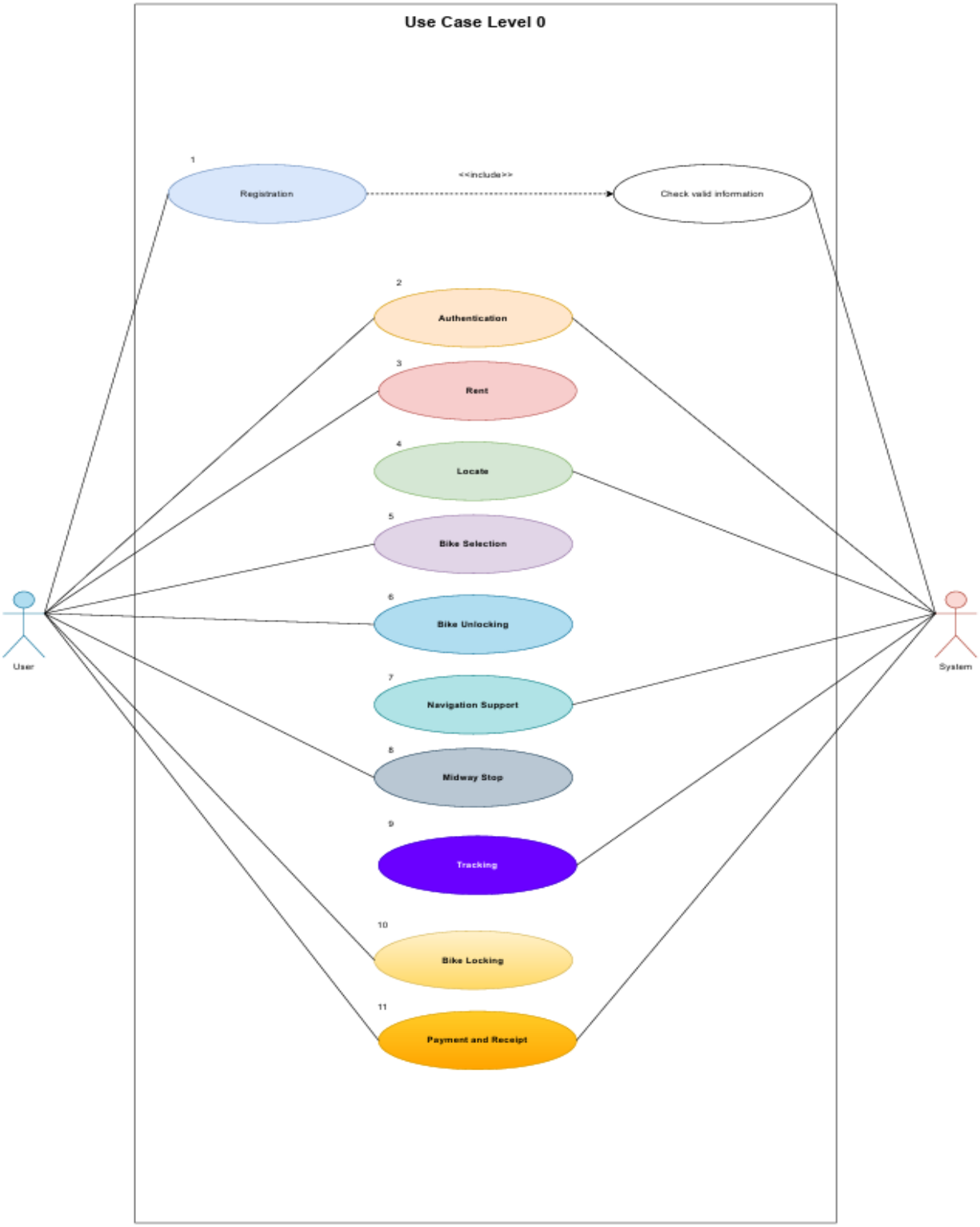
3. **Security**
    - The app should support **end-to-end encryption** to protect user's data.
    - The app should not be able to share the user's data with any kind of third party application without permission.
4. **Operational**
    - The users should be able to give feedback about their experience using the application.
    - The user should be able to rate the application.

4. Complete Use Case Diagram



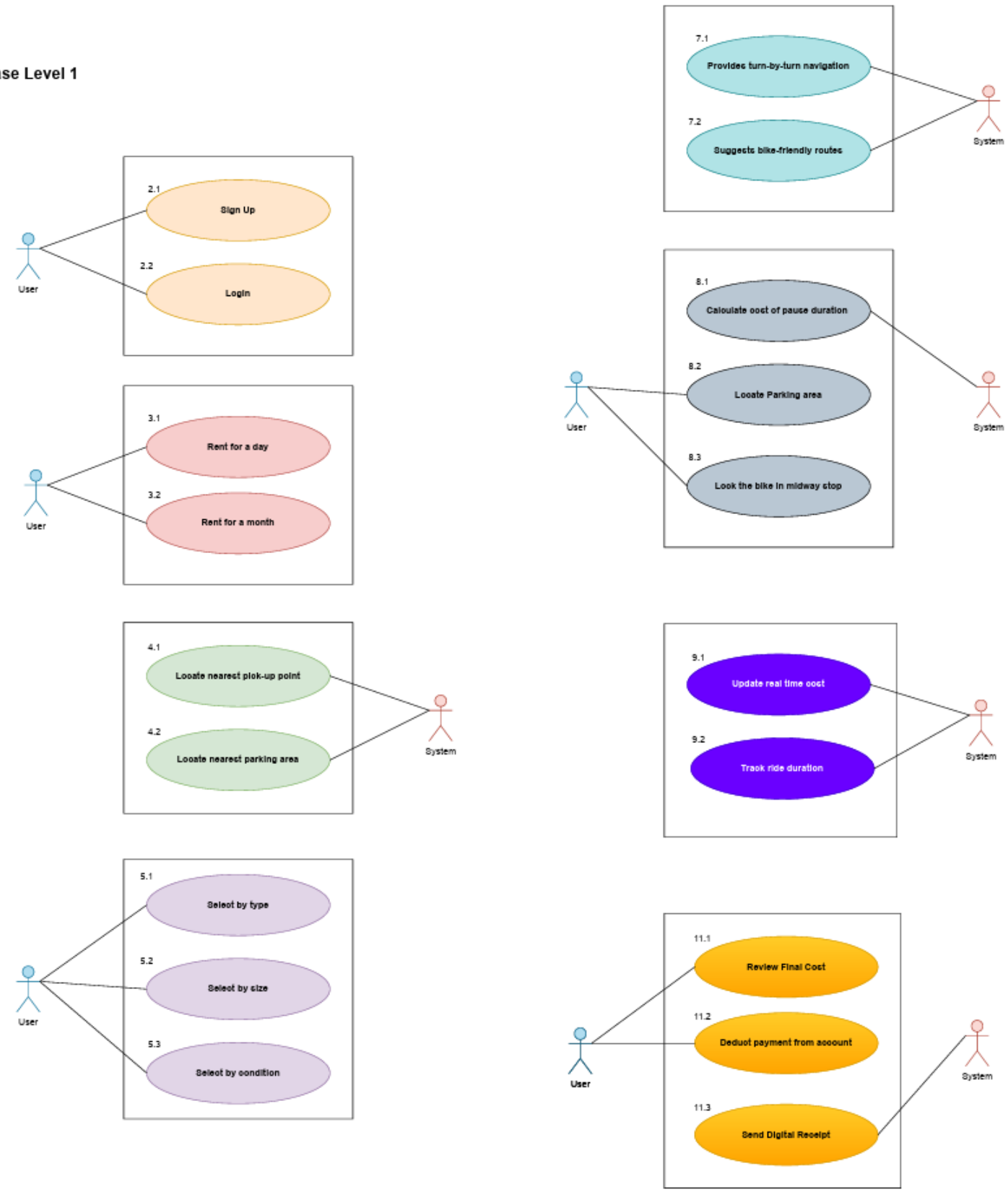


4.1. Use Case: Level 0

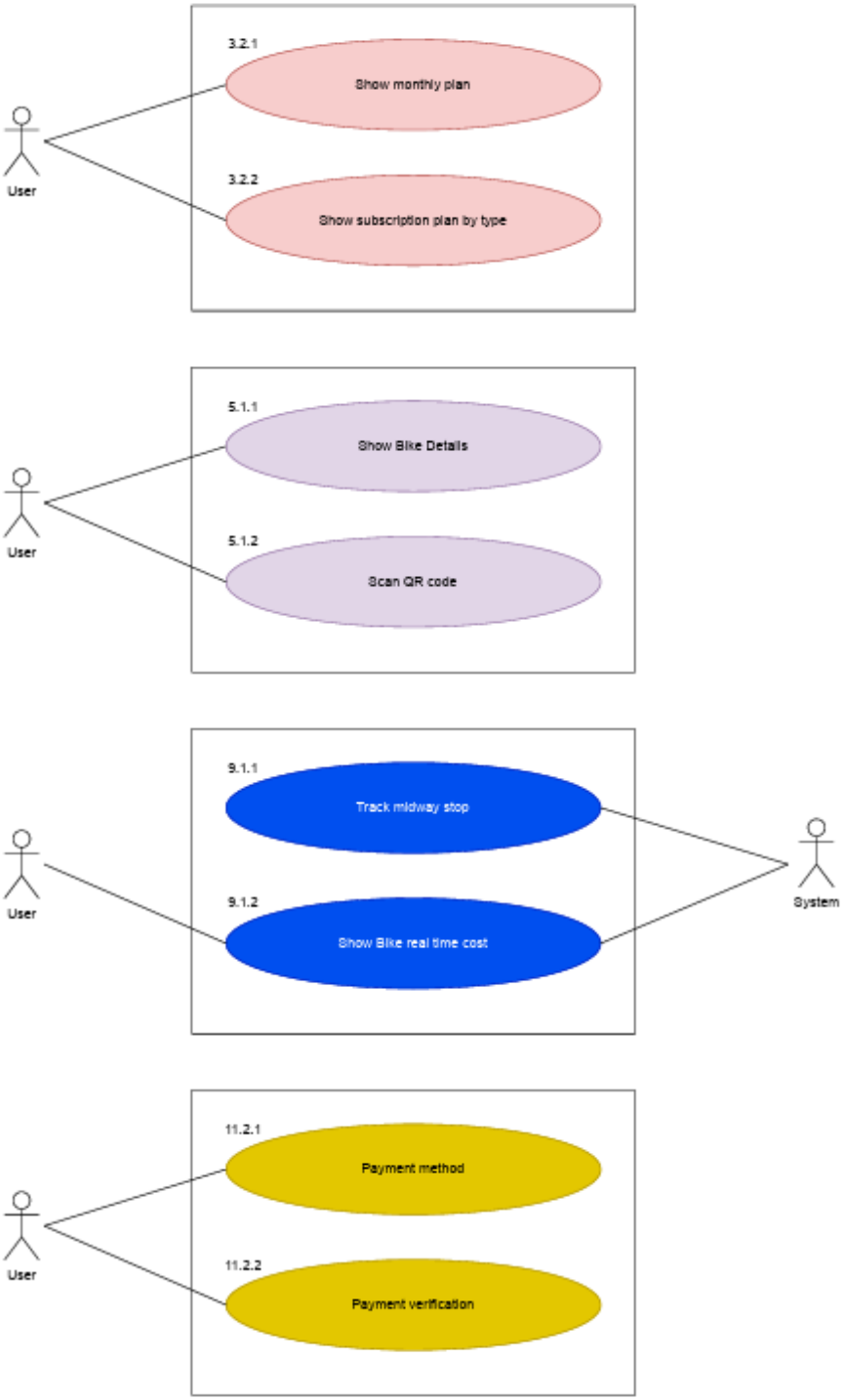


4.2. Use Case: Level 1

Use Case Level 1

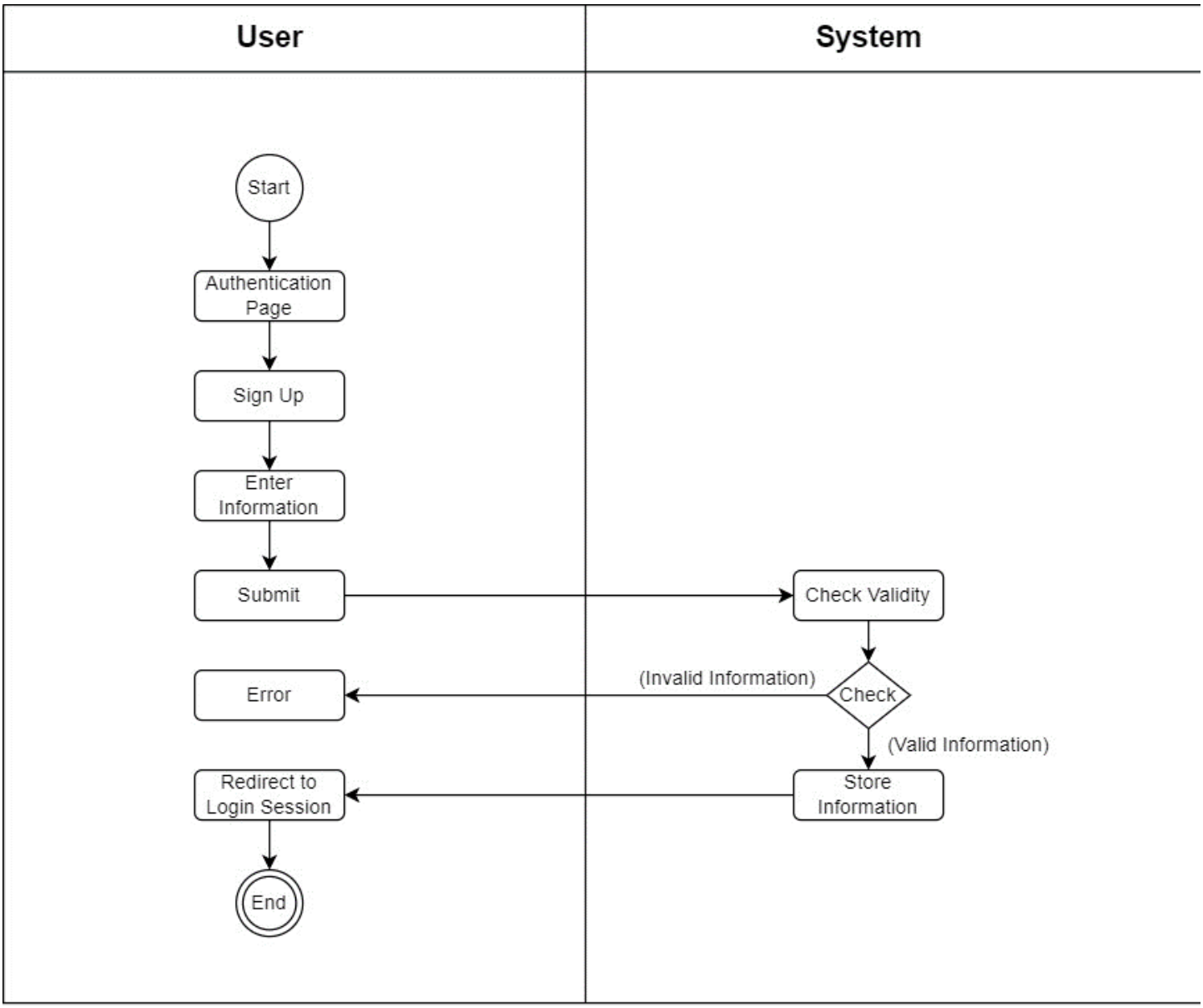


4.3. Use Case: Level 2

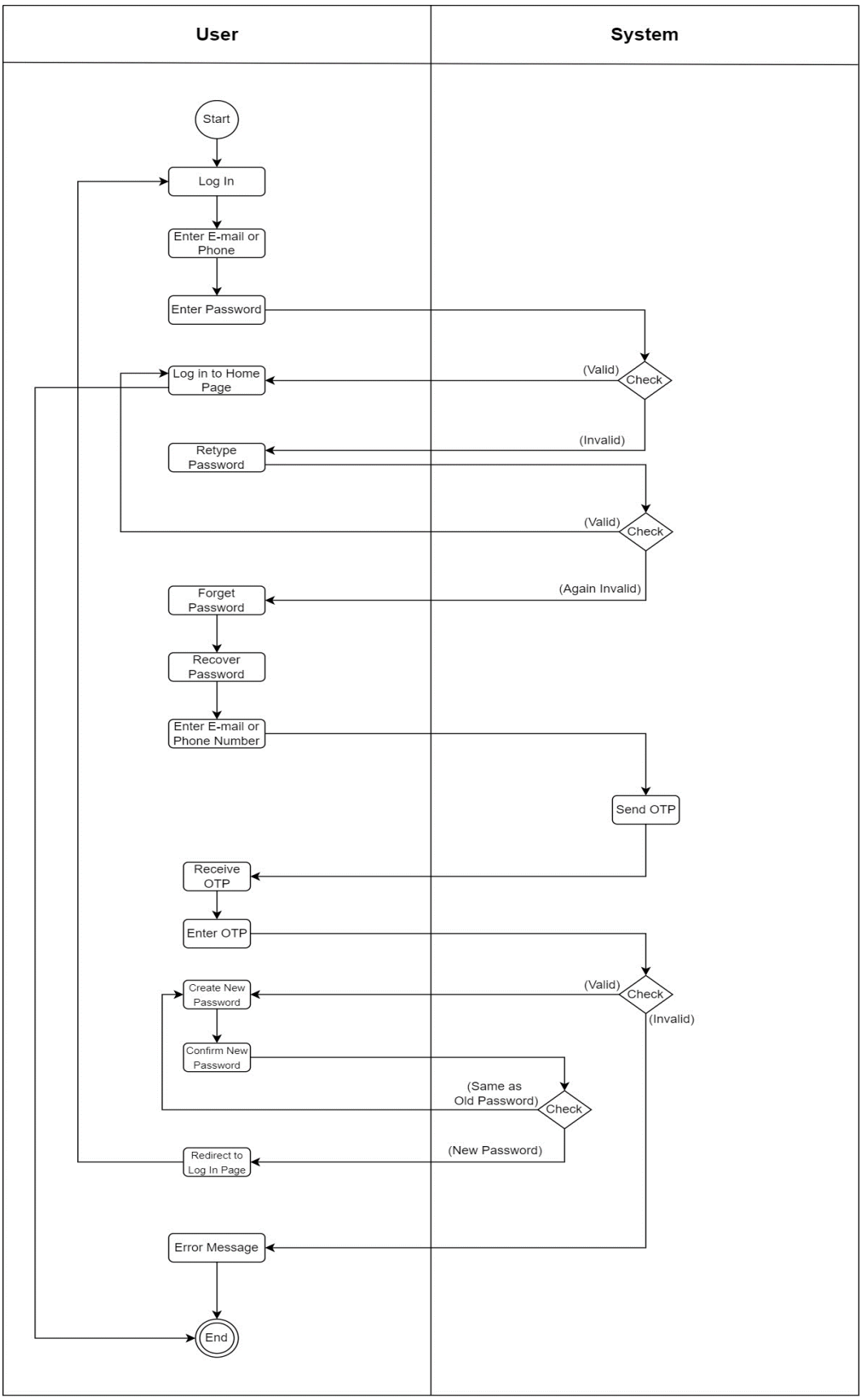


5. Activity Diagrams

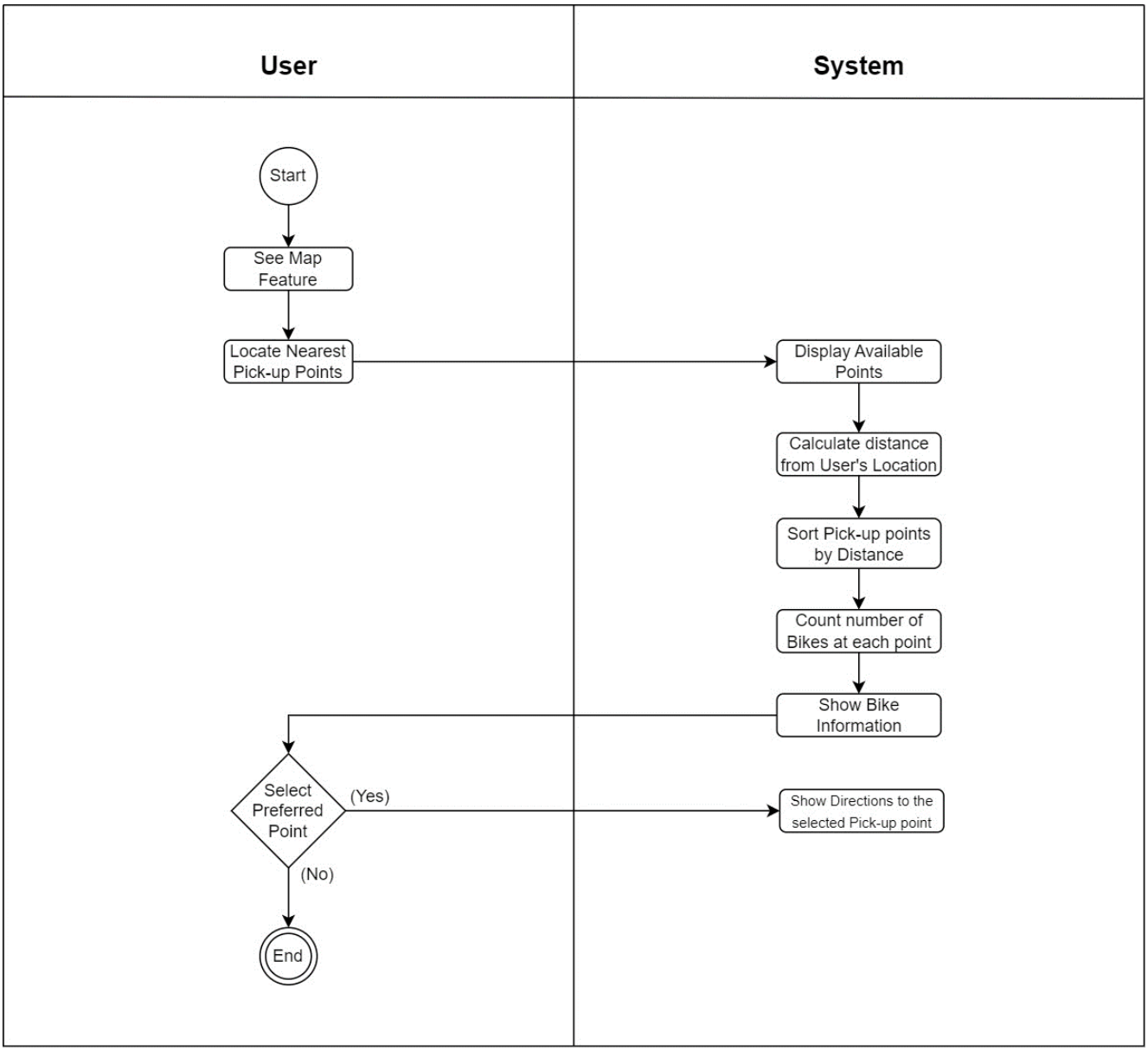
5.1. User's Authentication Activity Diagram



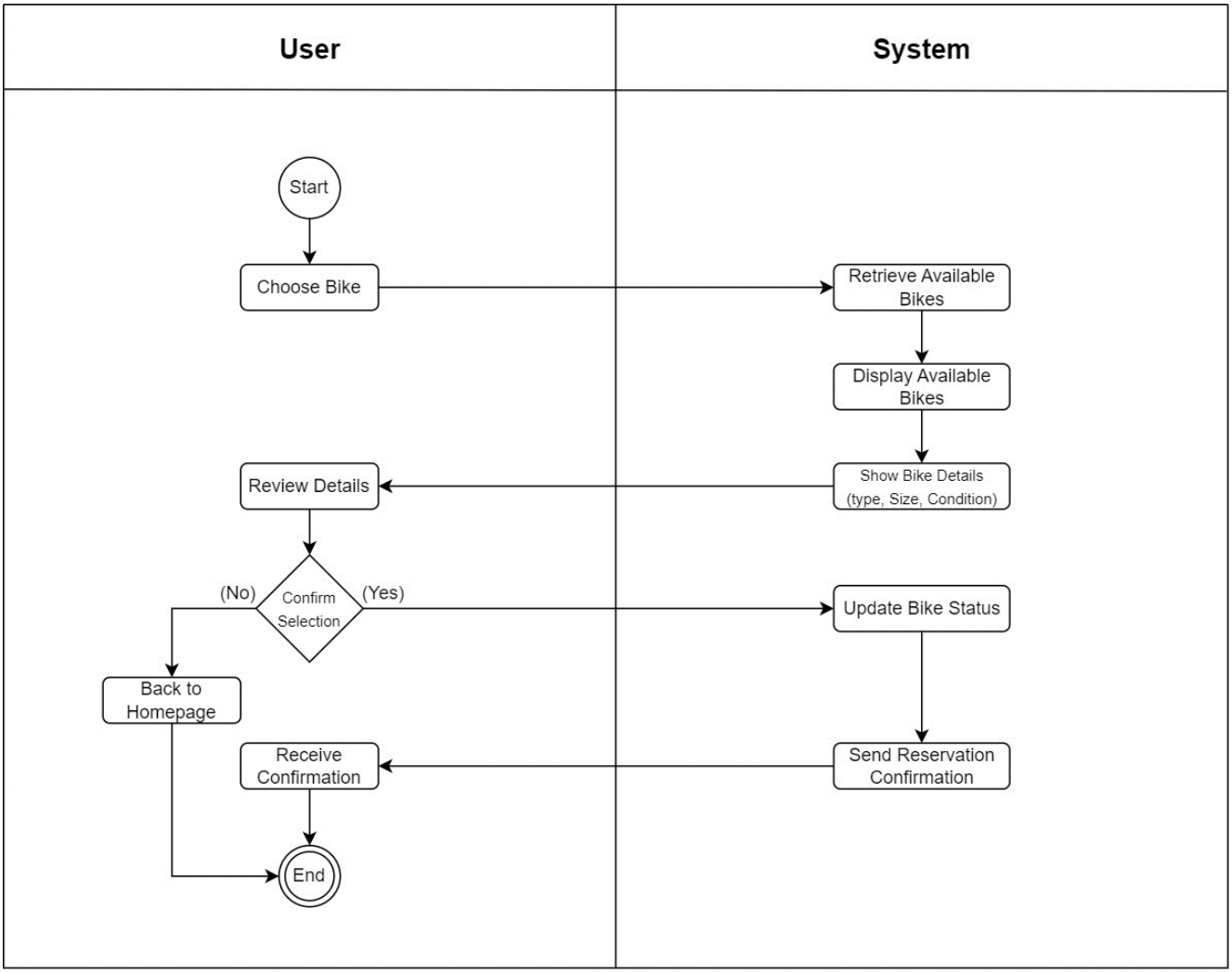
5.2. User's Login Activity Diagram



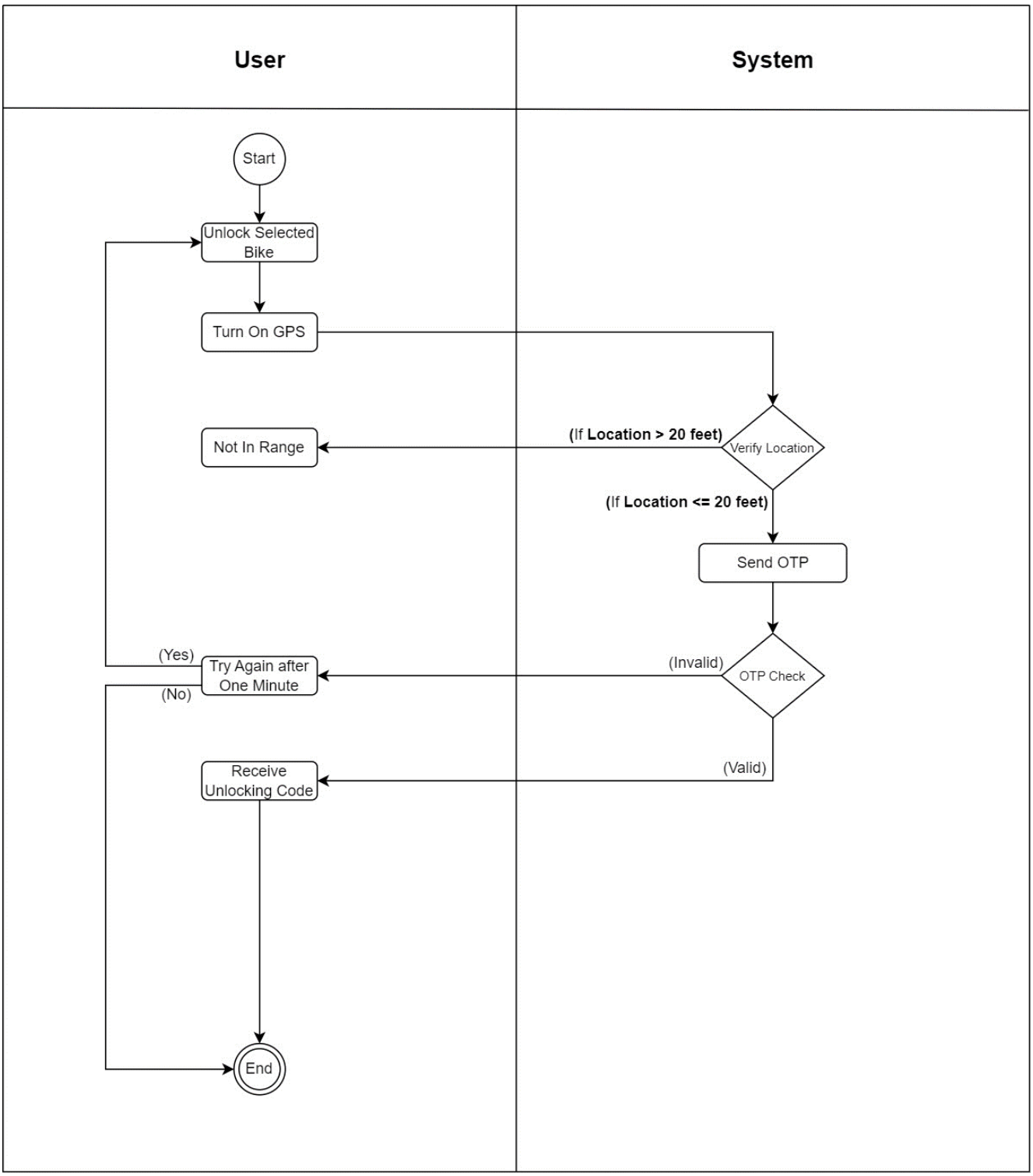
5.3. Activity Diagram of Finding Nearest Bike Pick-up Point



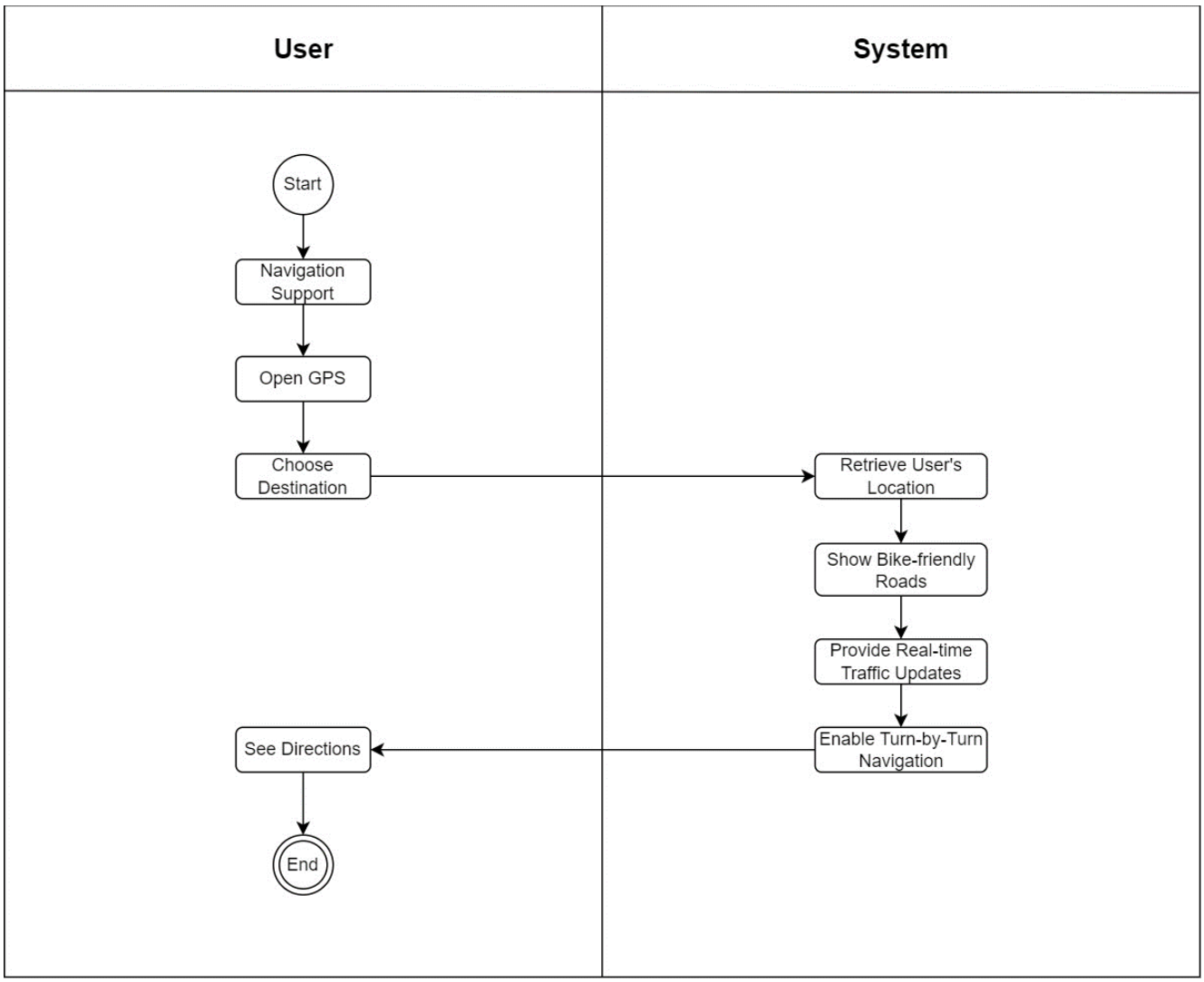
5.4. Activity Diagram of Selecting a Bike



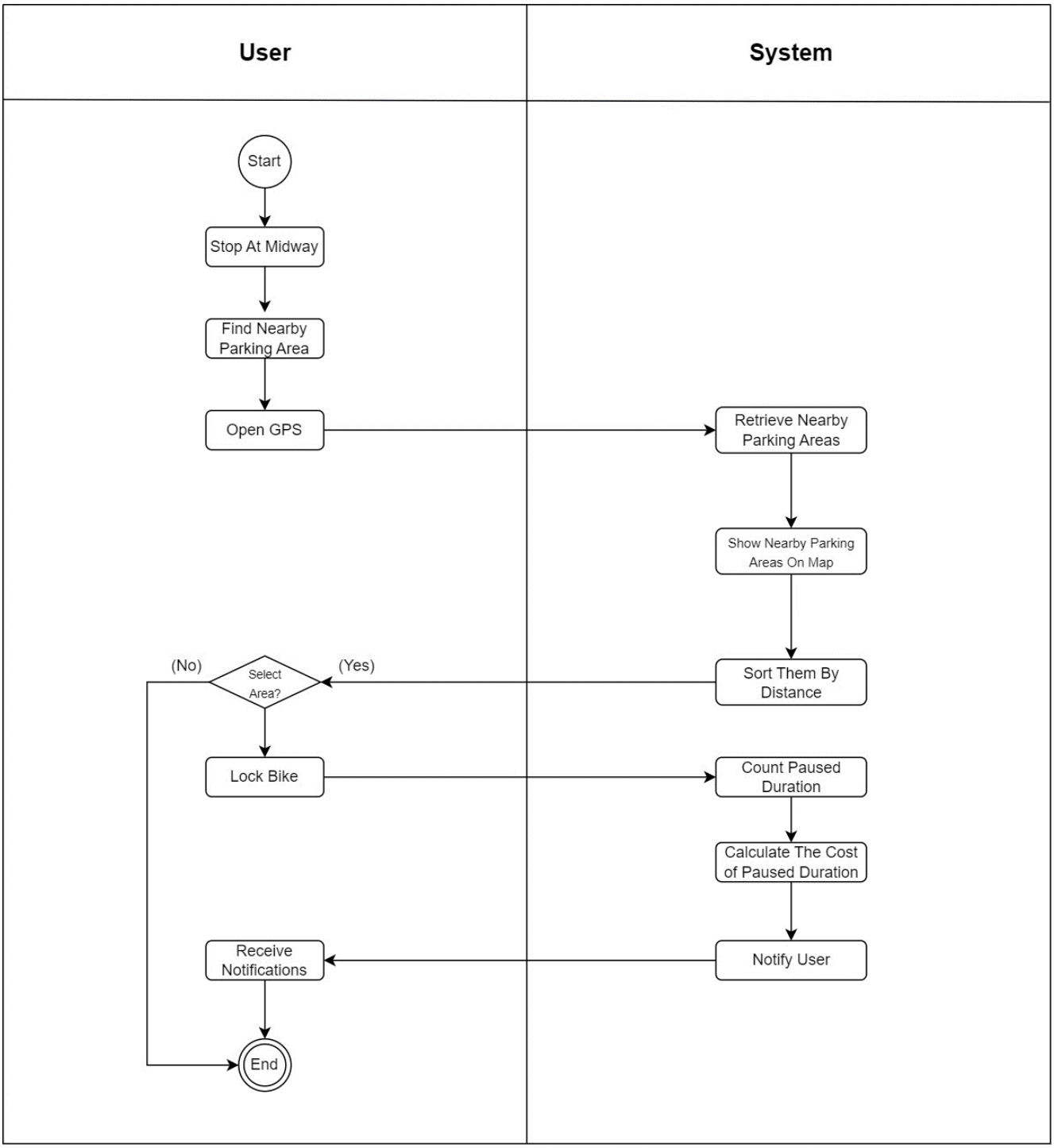
5.5. Activity Diagram of Unlocking The Bike



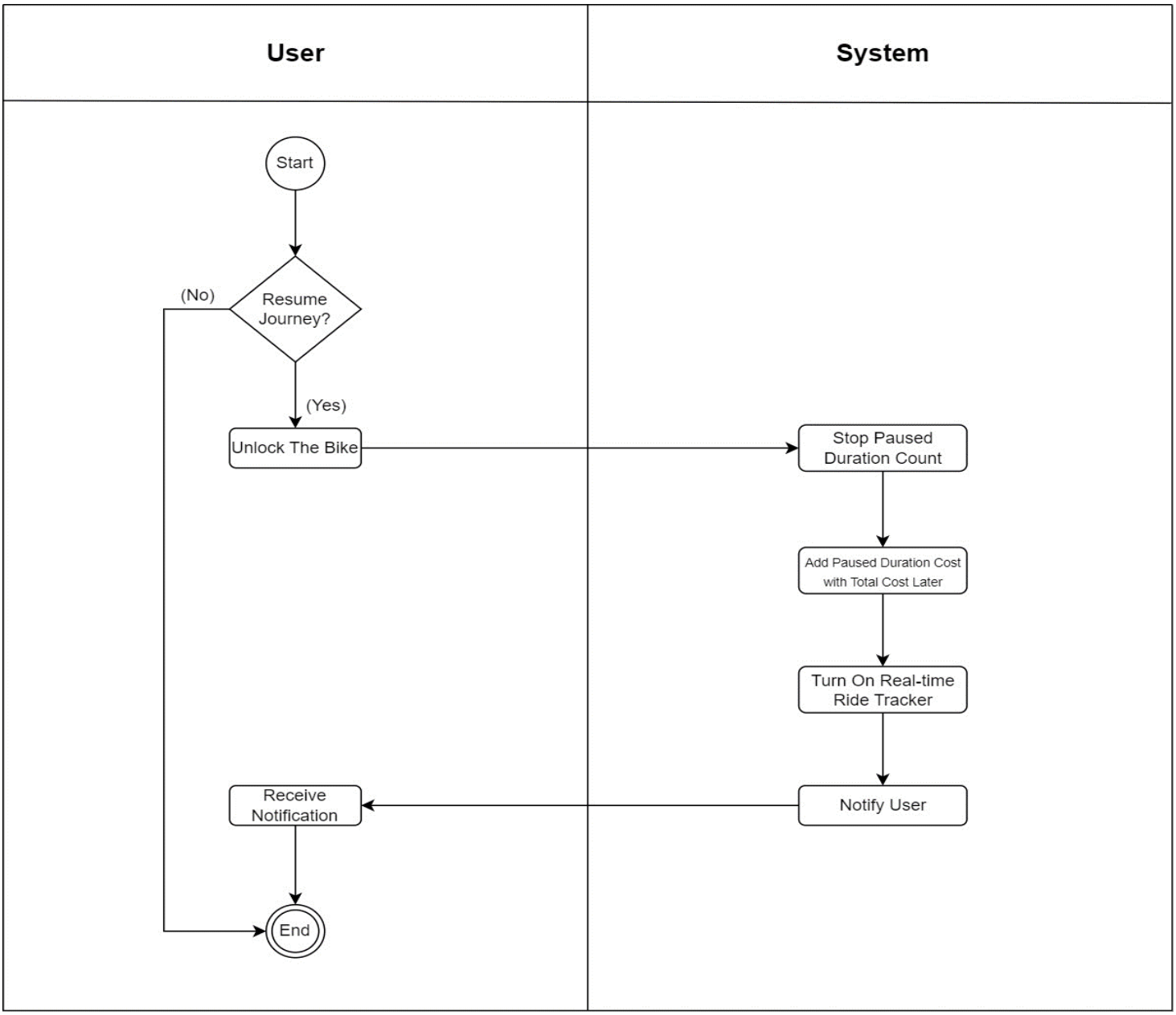
5.6. Activity Diagram of Navigation Assistance



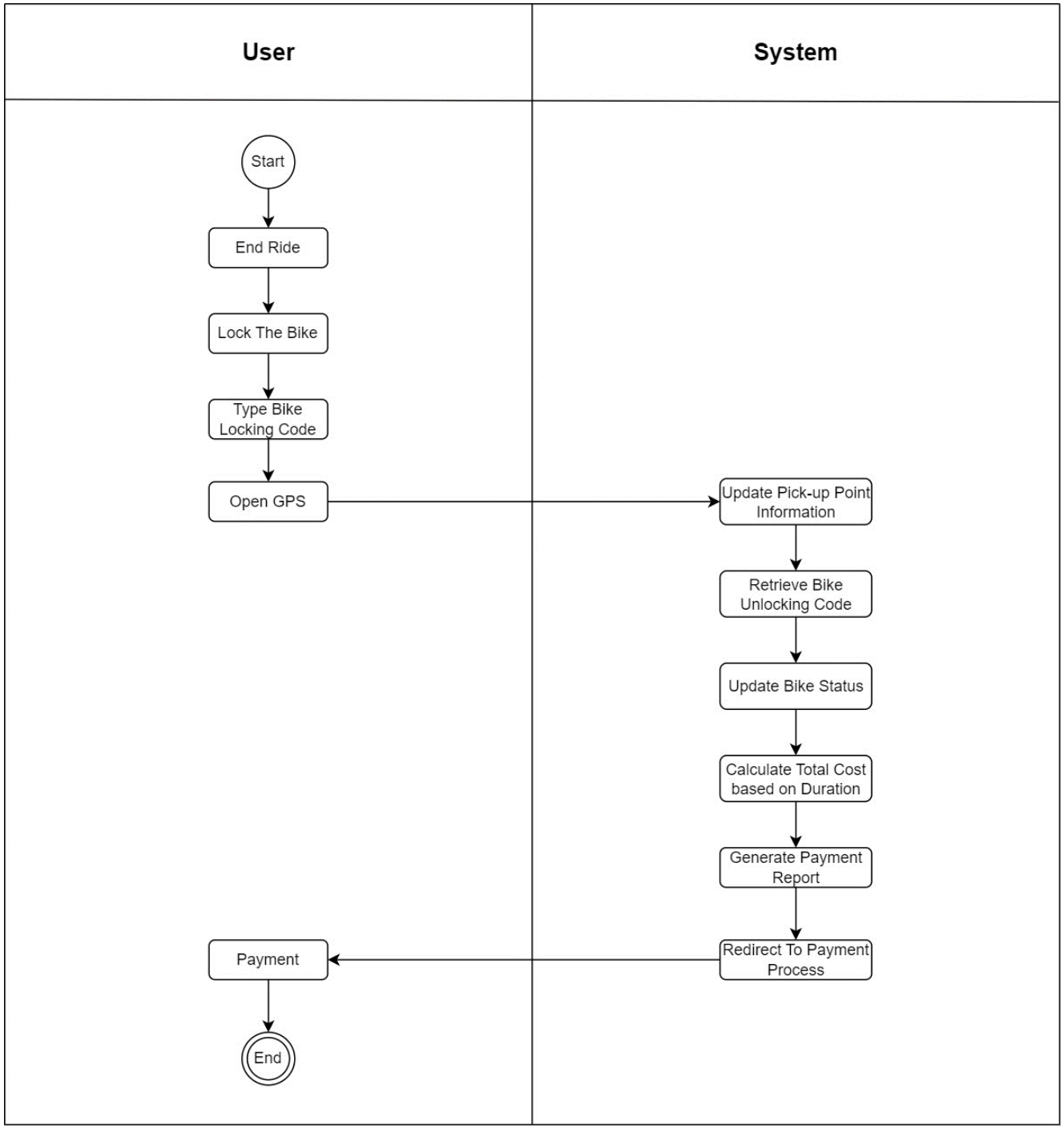
5.7. Activity Diagram of Midway Stop



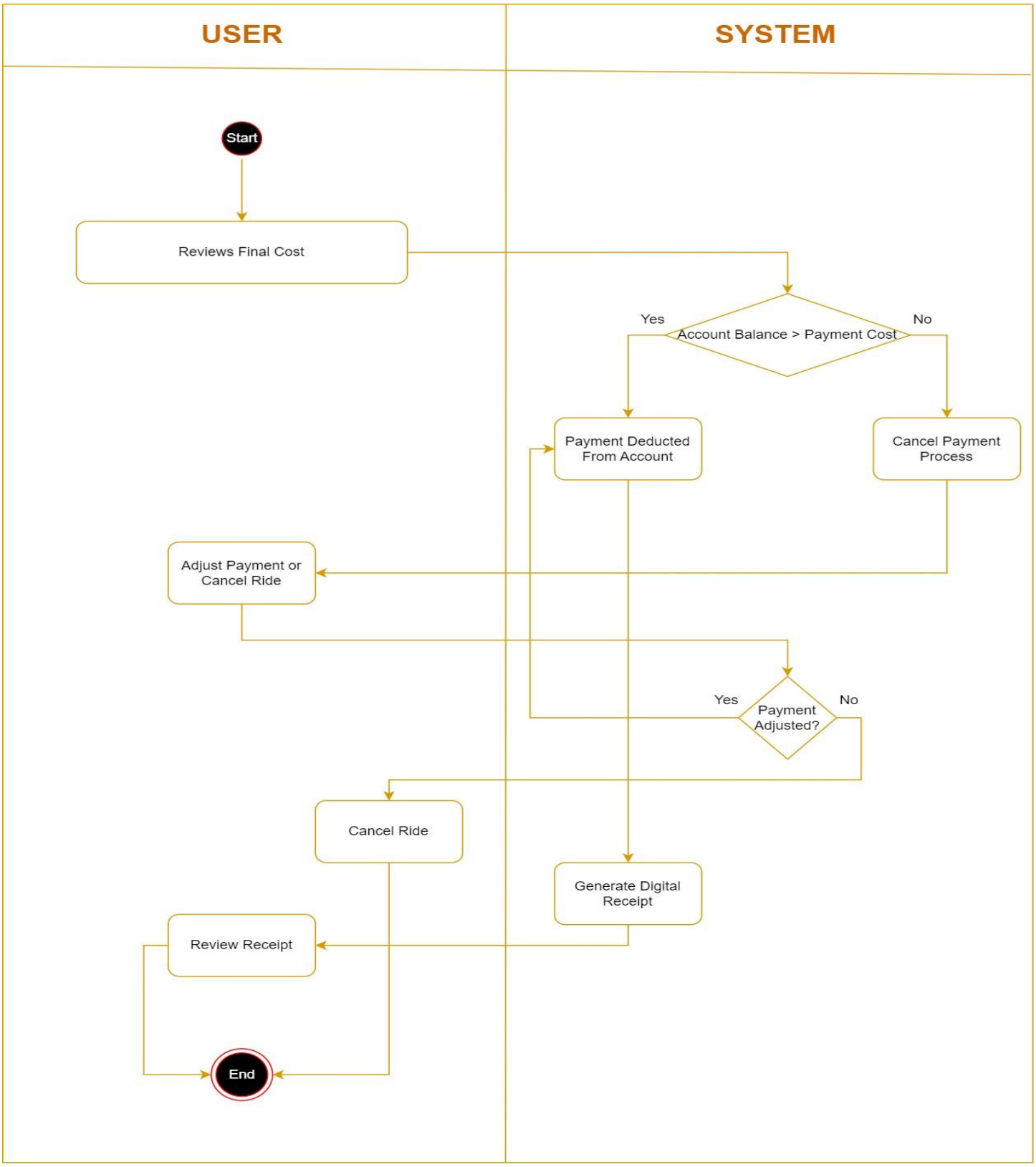
5.8. Activity Diagram of Continuing The Journey



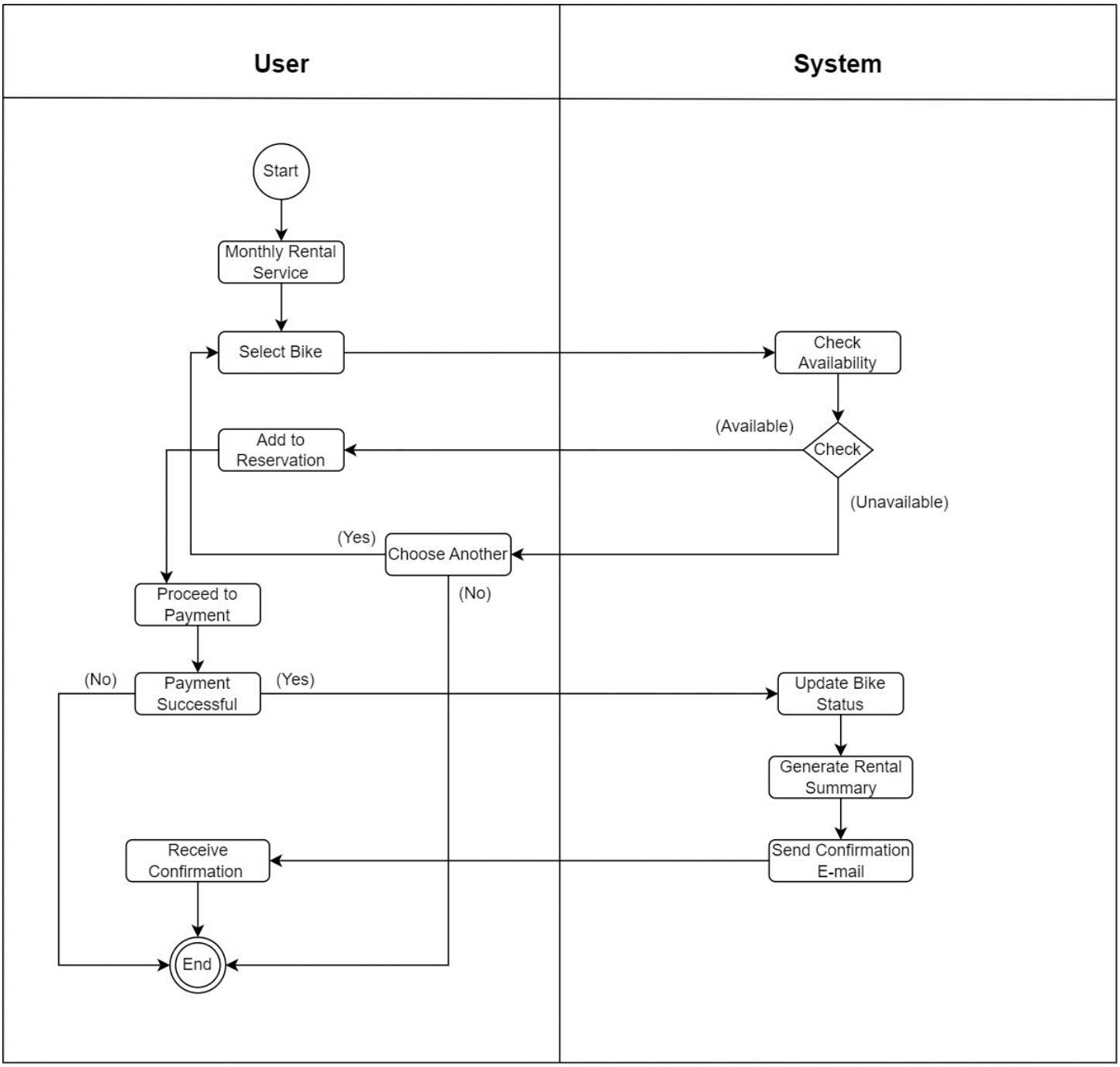
5.9. Activity Diagram of Ending The Ride



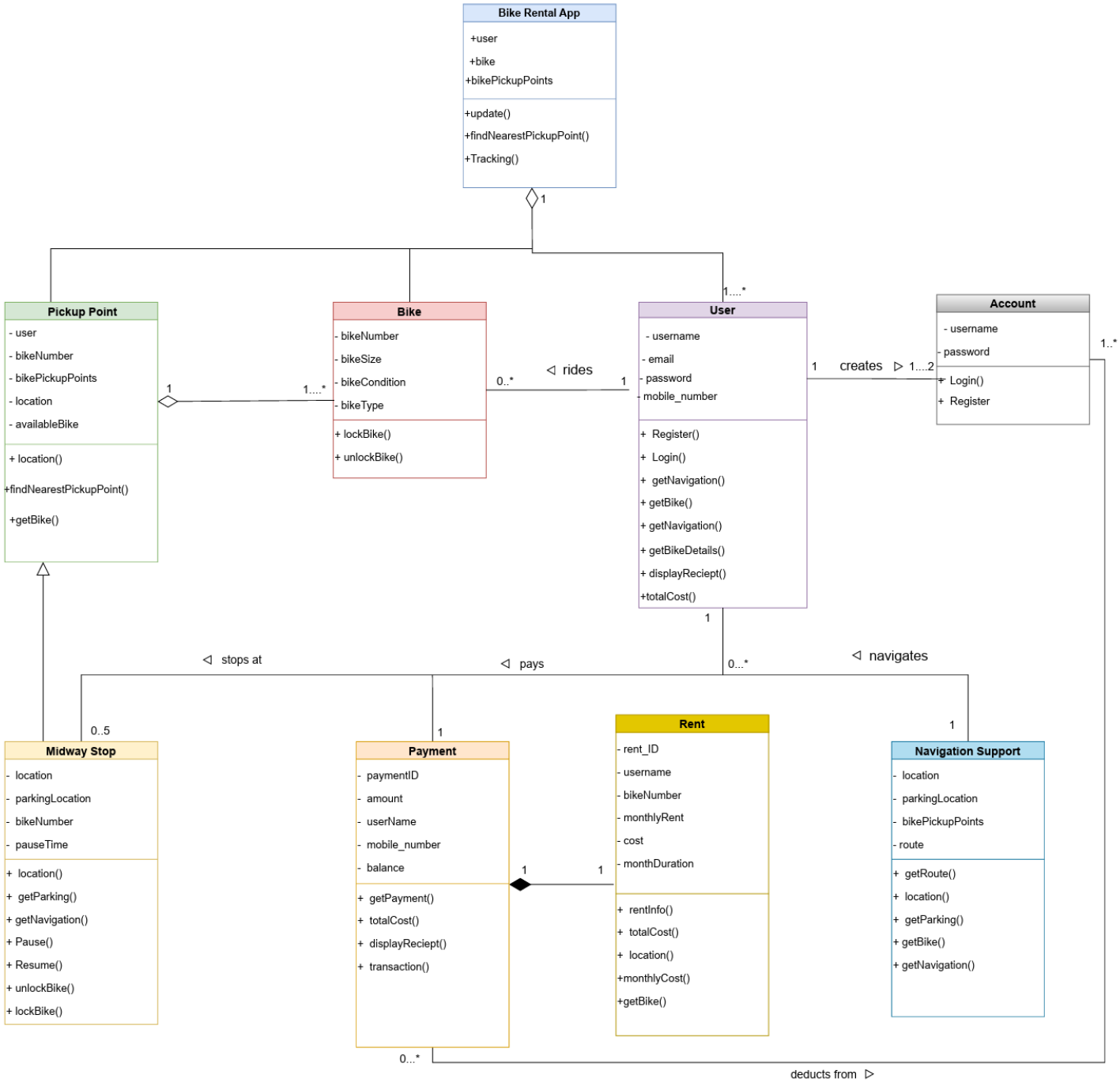
5.10. Activity Diagram of Payment & Receipt



5.11. Activity Diagram of Monthly Rental Service

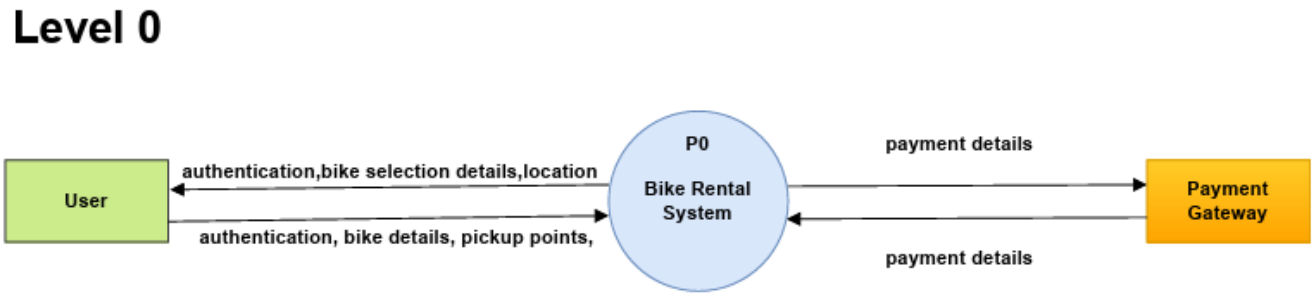


6. Class Diagram

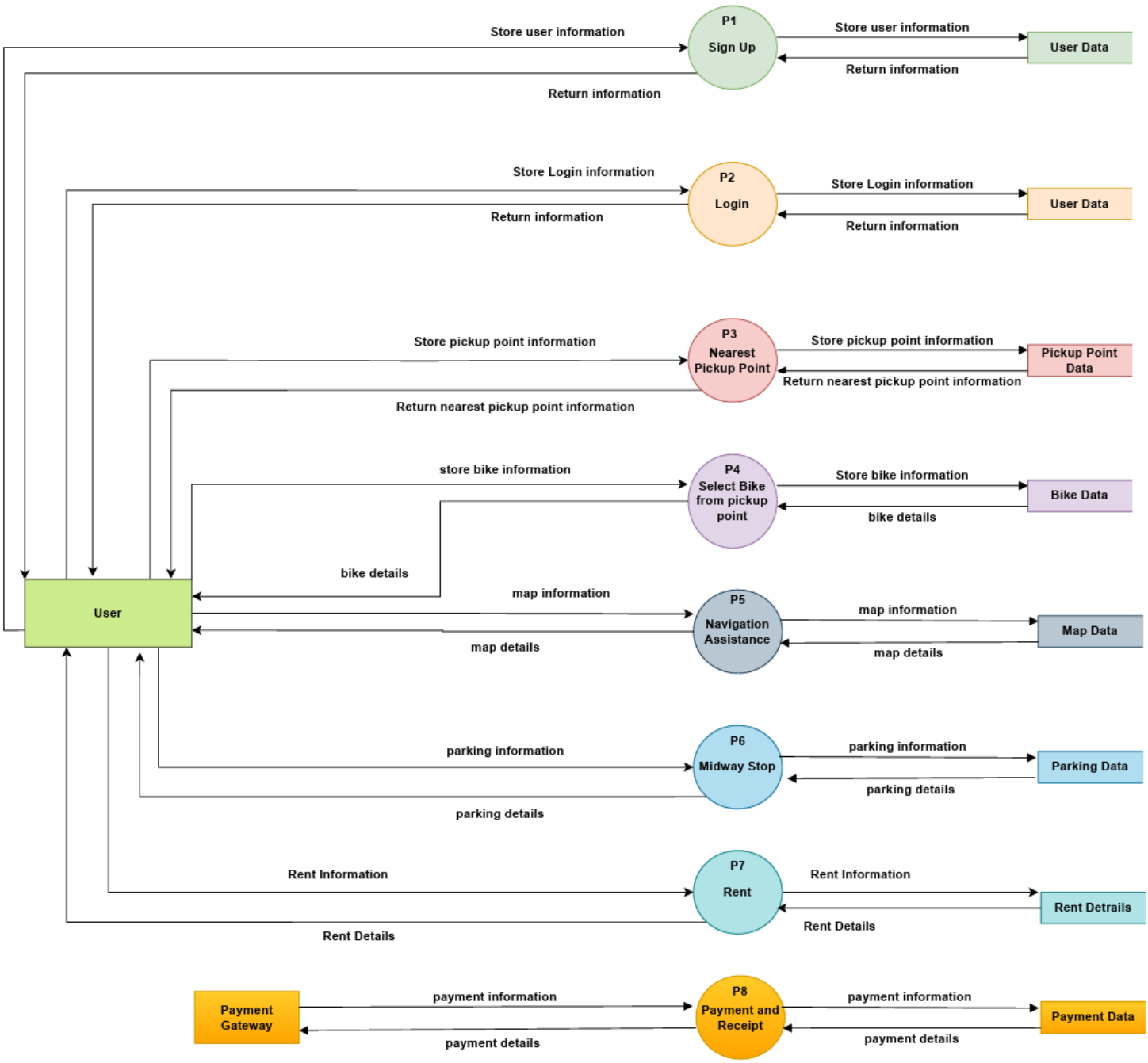


7. Data Flow Diagrams

7.1. Level 0 of Data Flow Diagram

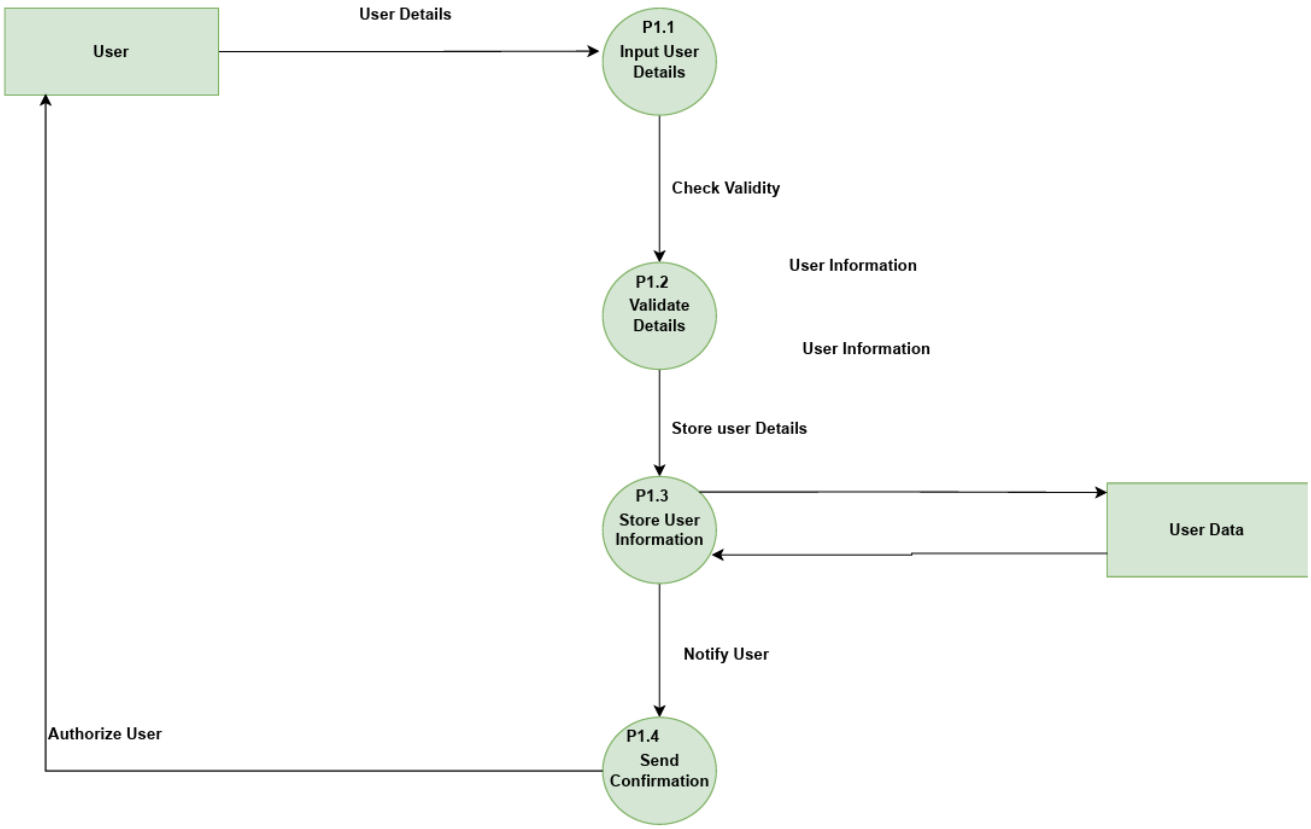


7.2. Level 1 of Data Flow Diagram

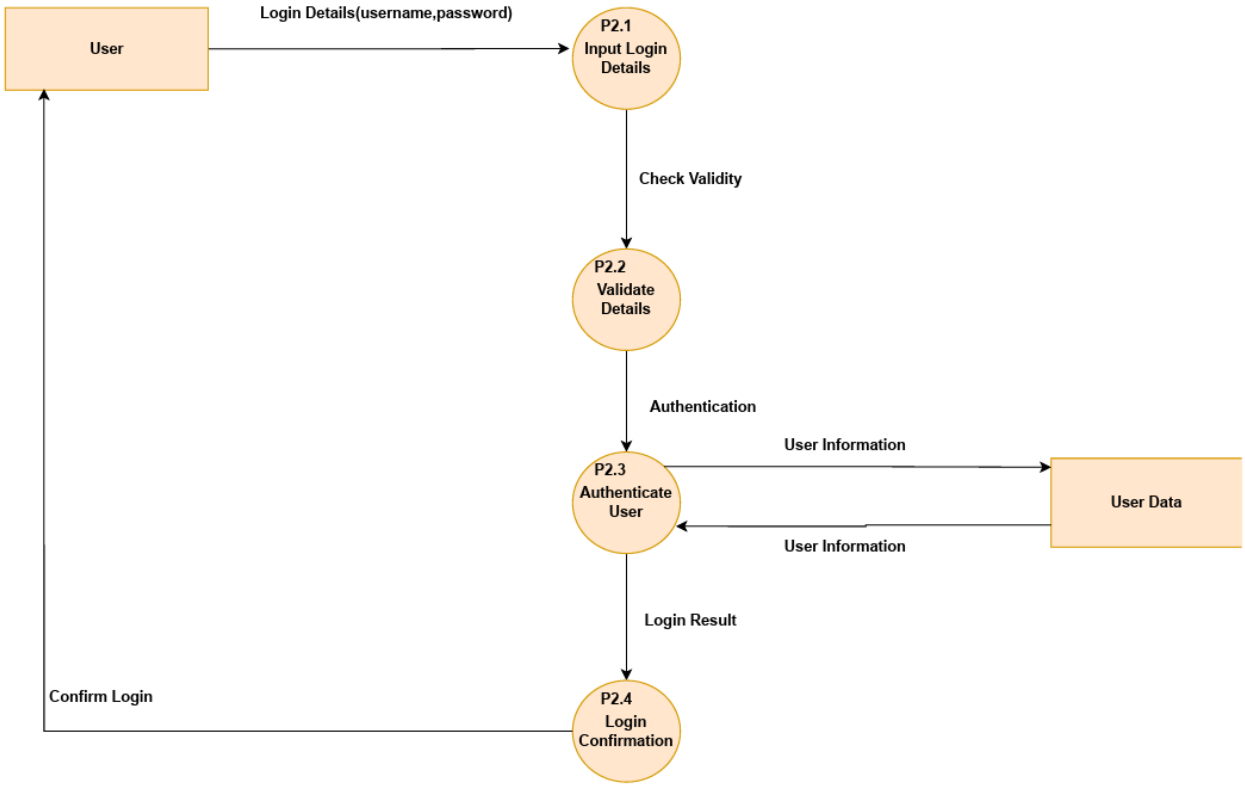


7.3. Level 2 of Data Flow Diagram

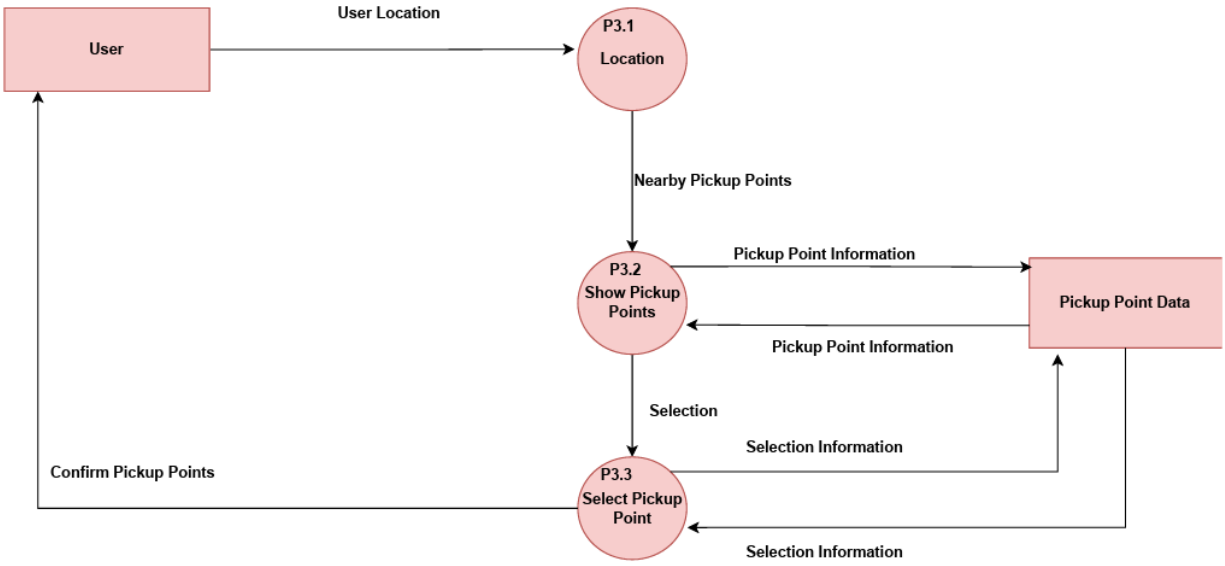
7.3.1 DFD of User Authentication



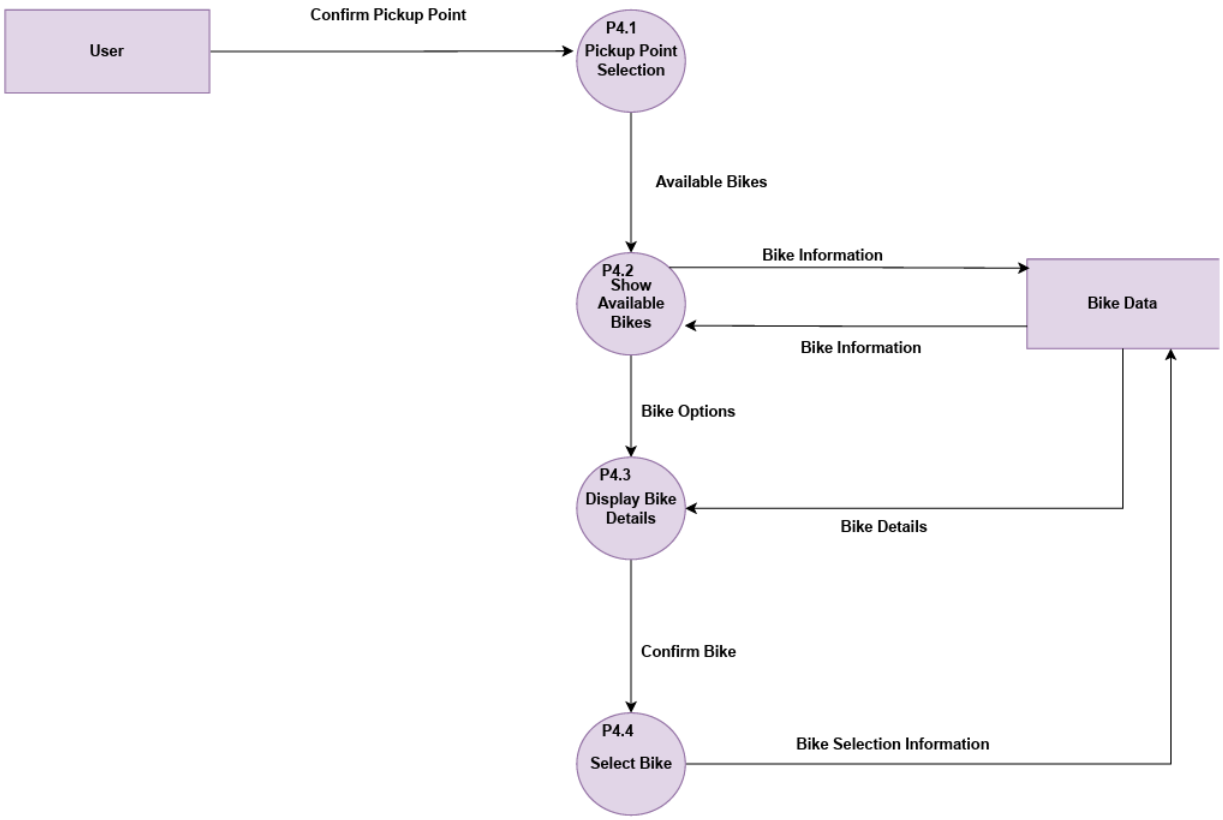
7.3.2 DFD of User Login



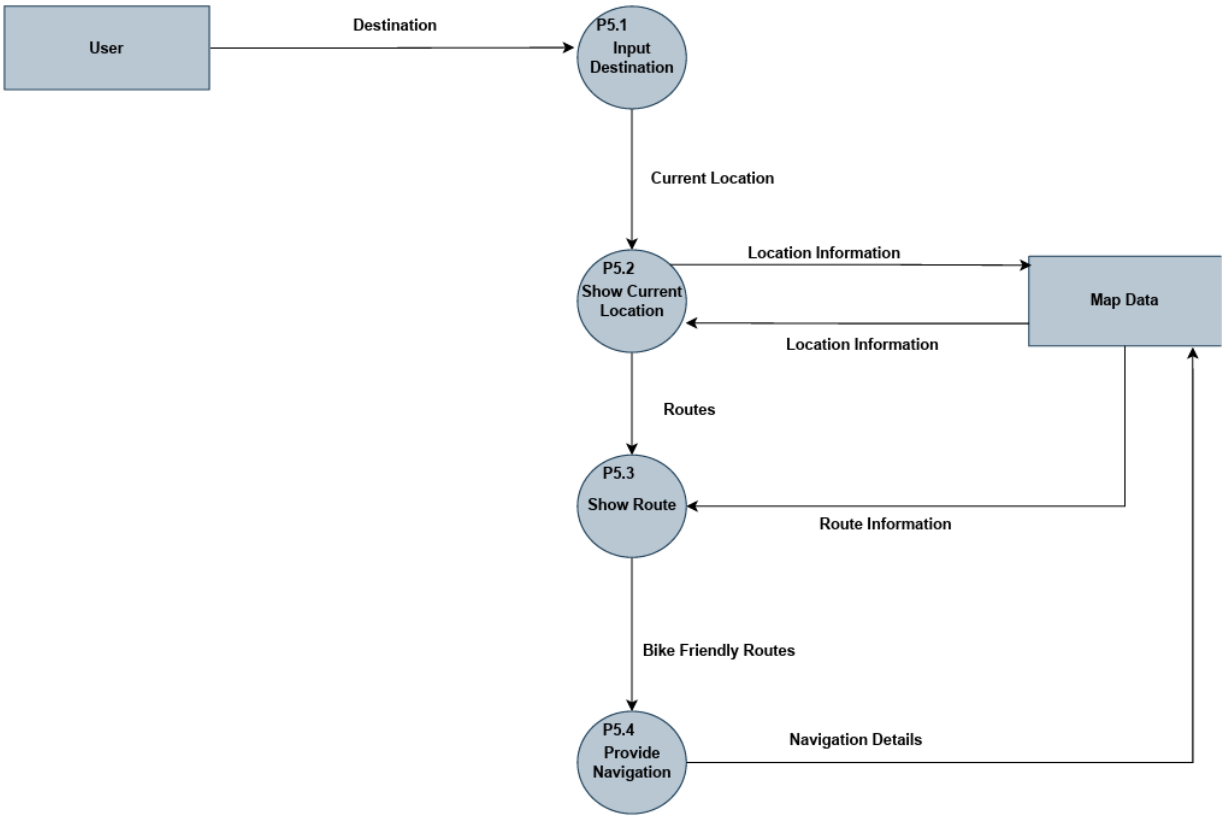
7.3.3 DFD of Finding Nearest Bike Pick-up Point



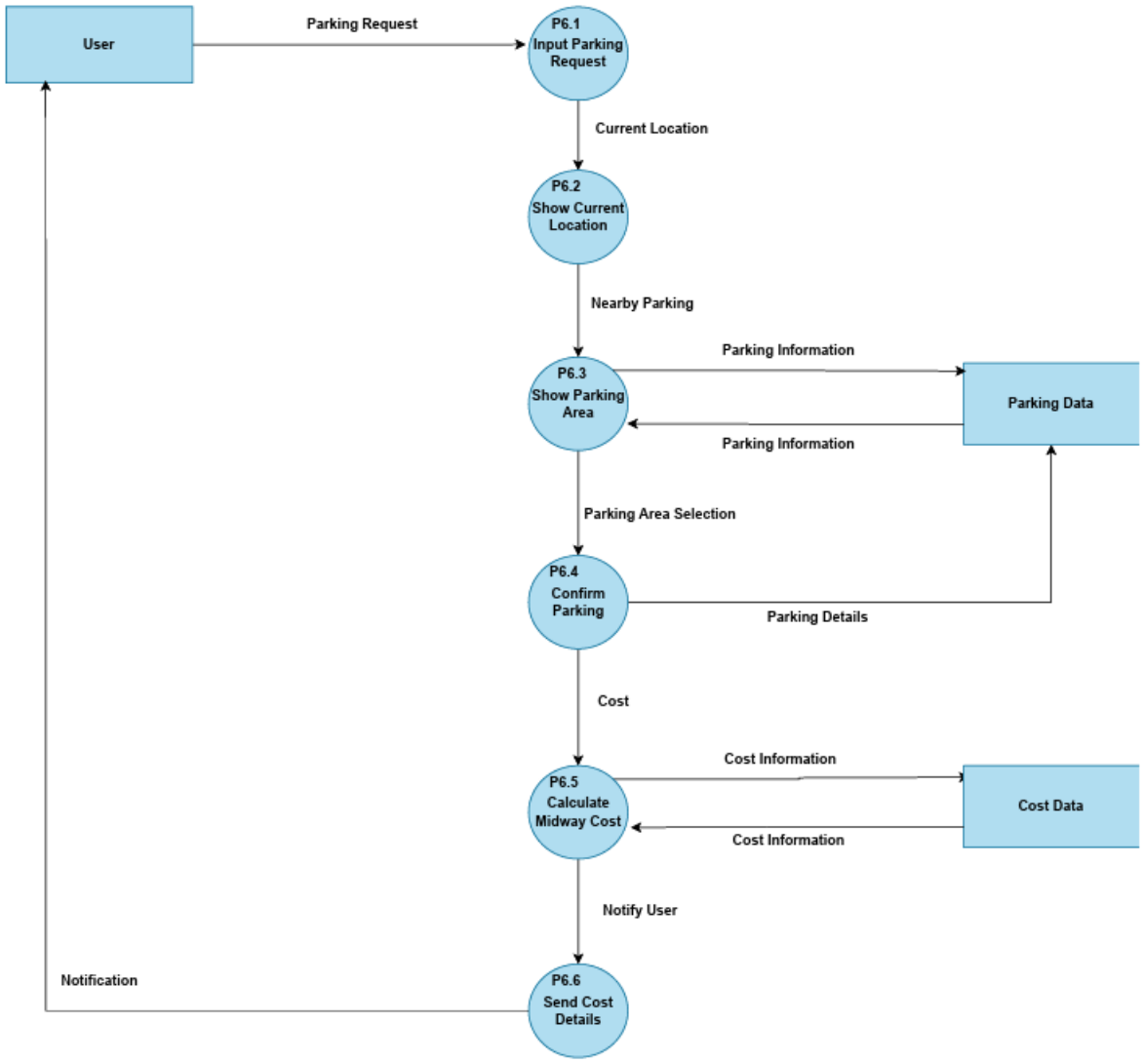
7.3.4 DFD of Selecting a Bike



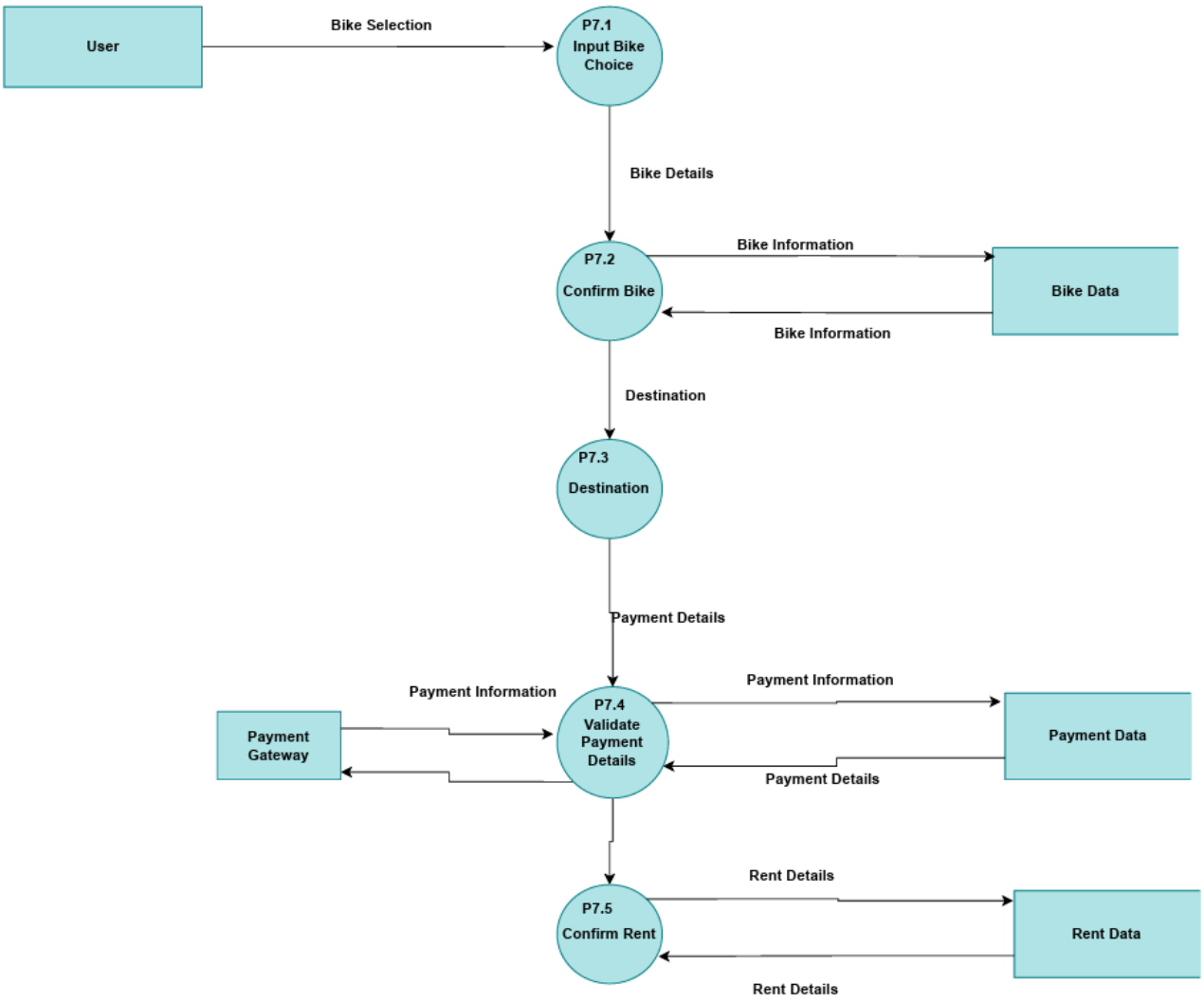
7.3.5 DFD of Navigation Assistance



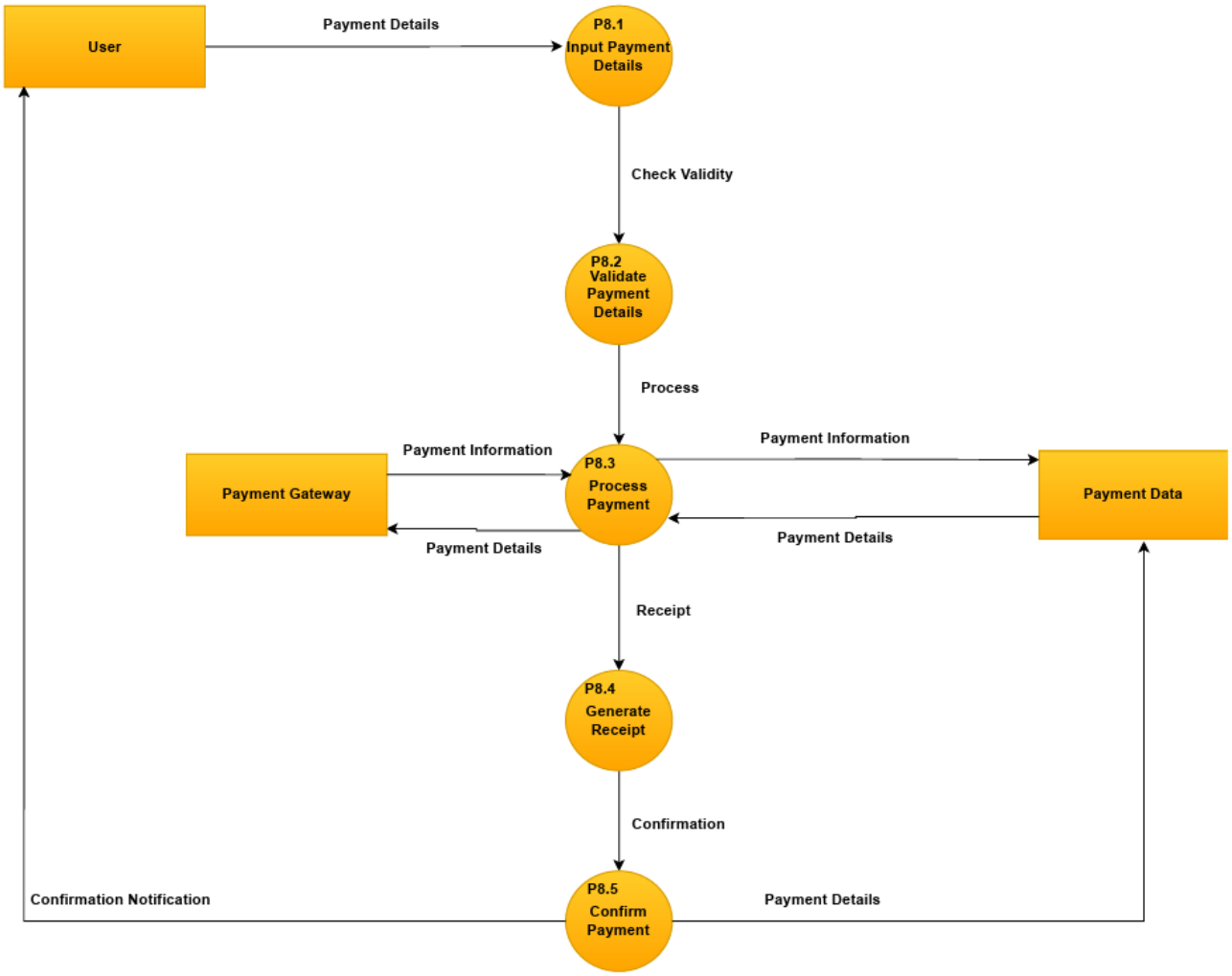
7.3.6 DFD of Midway Stop



7.3.7 DFD of Monthly Rental Service

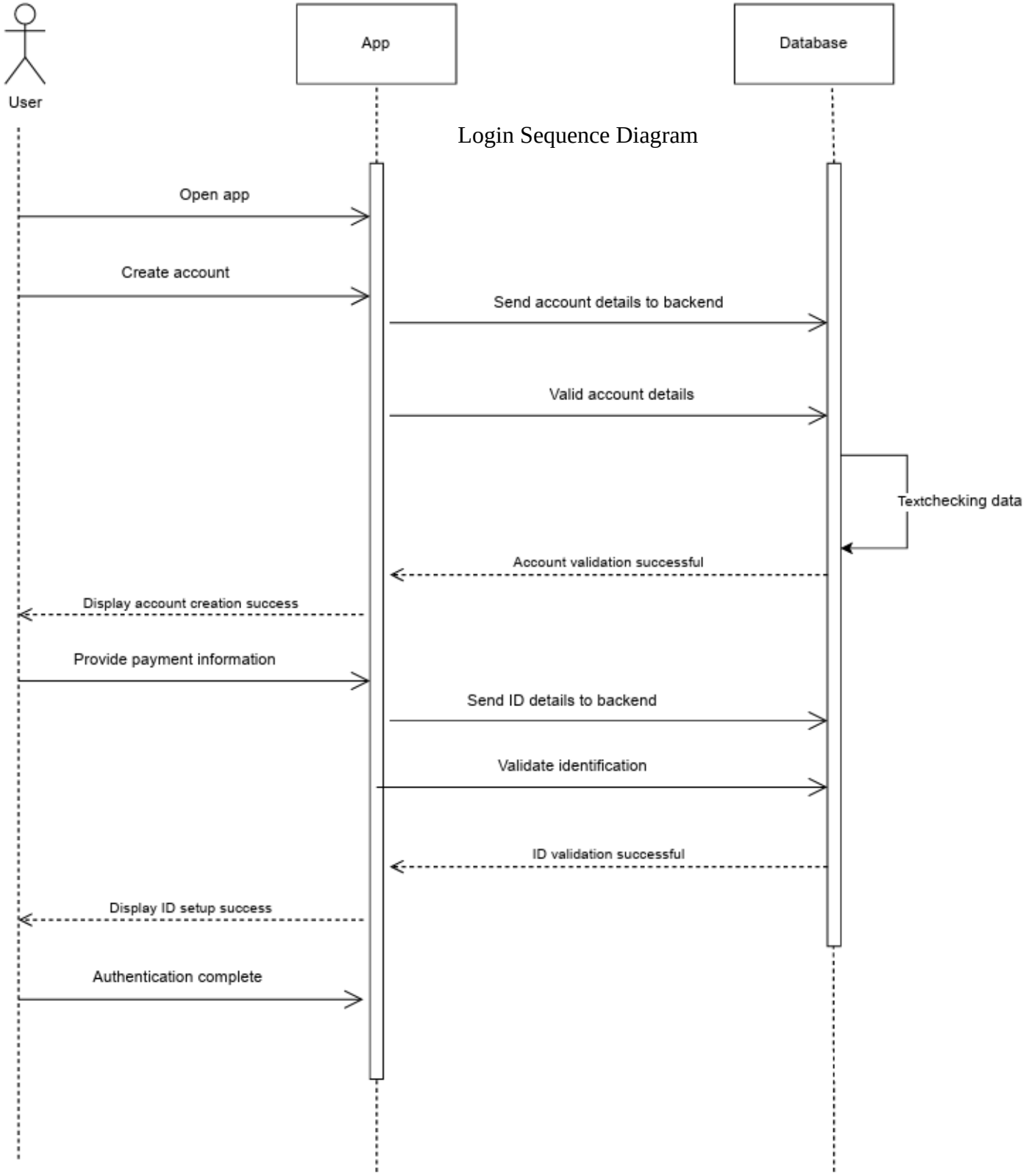


7.3.8 DFD of Payment & Receipt



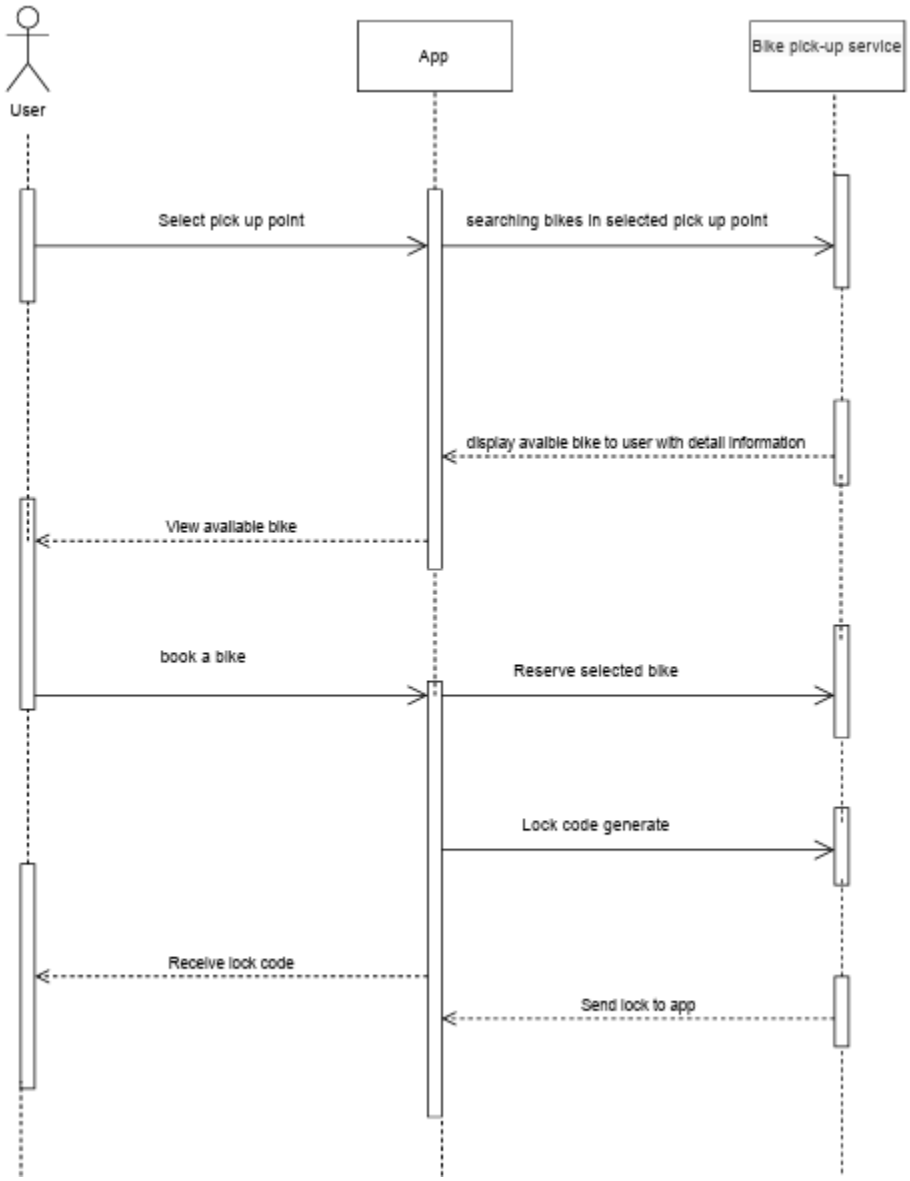
8. Sequence Diagrams

8.1. Sequence Diagram of Login

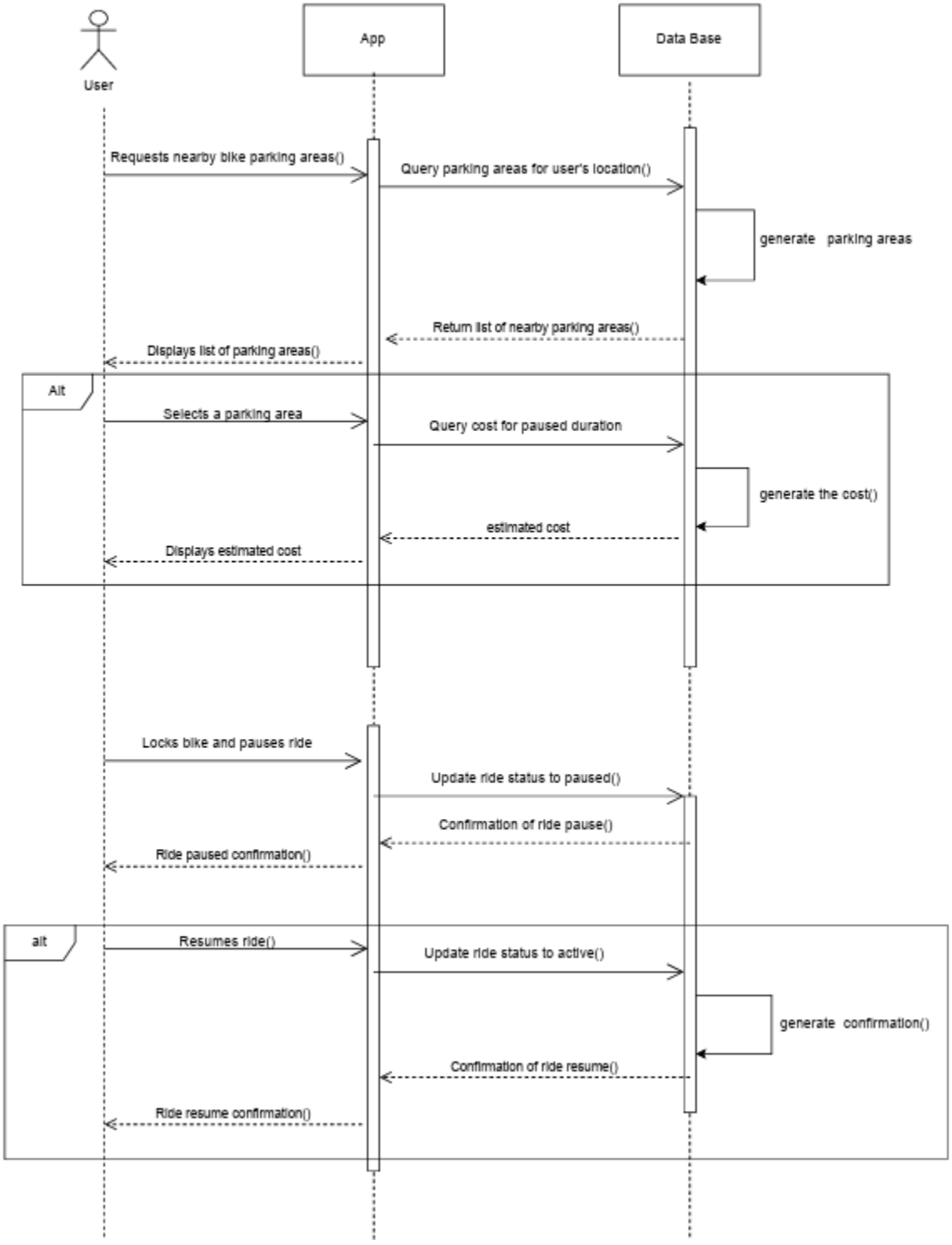


Login Sequence Diagram

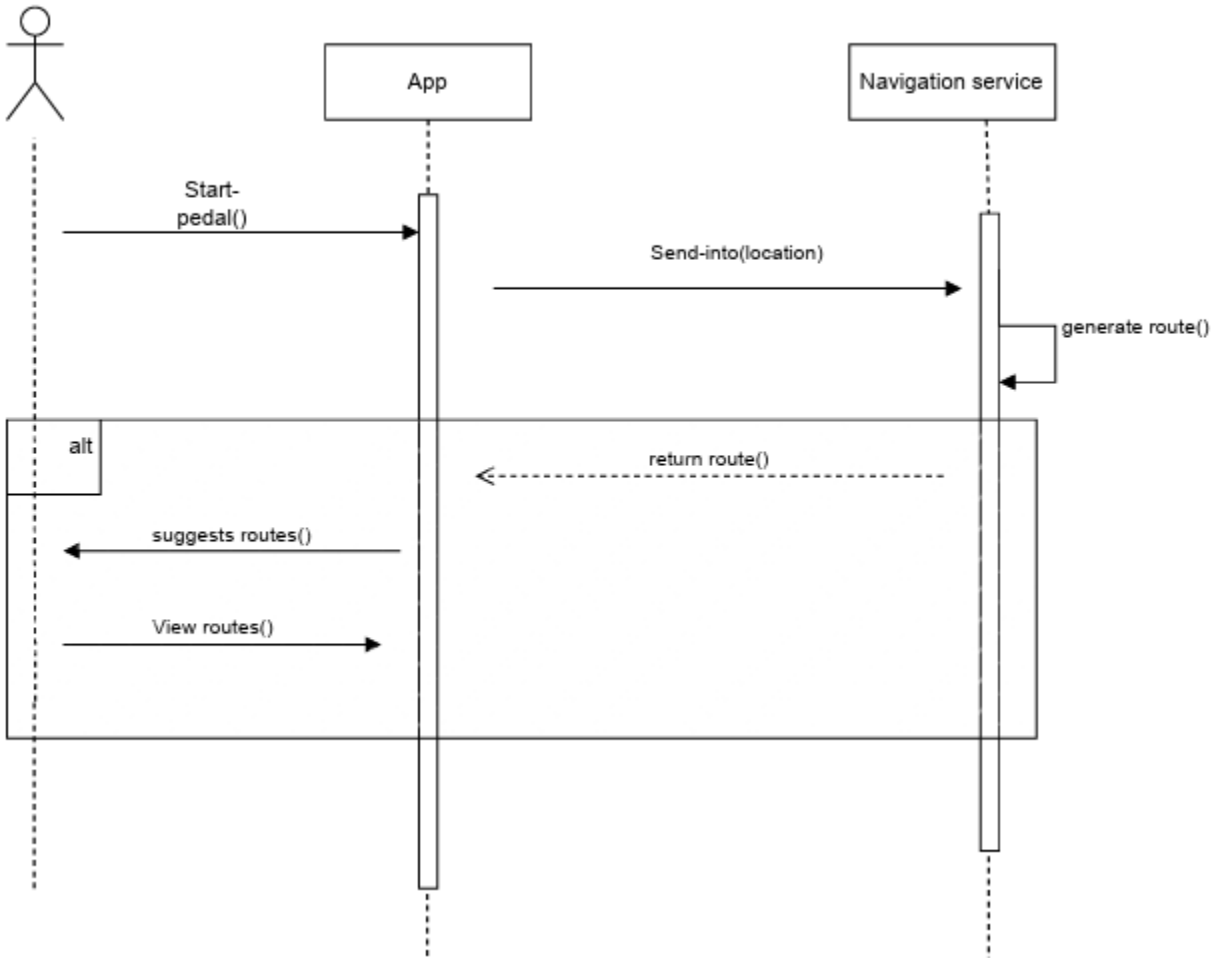
8.2. Sequence Diagram of Selecting a Bike



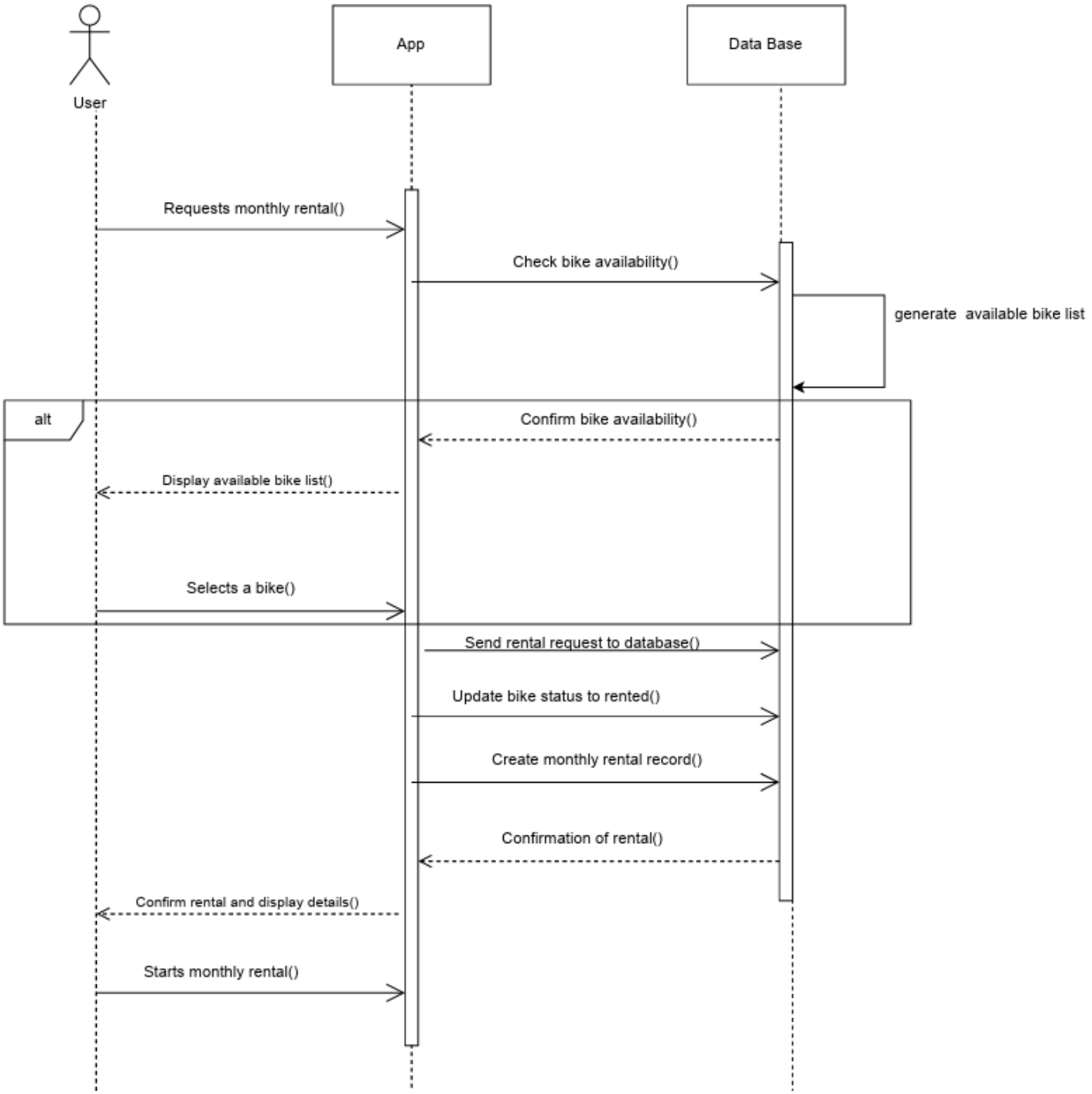
8.3. Sequence Diagram of Midway Stop & Continuing The Journey



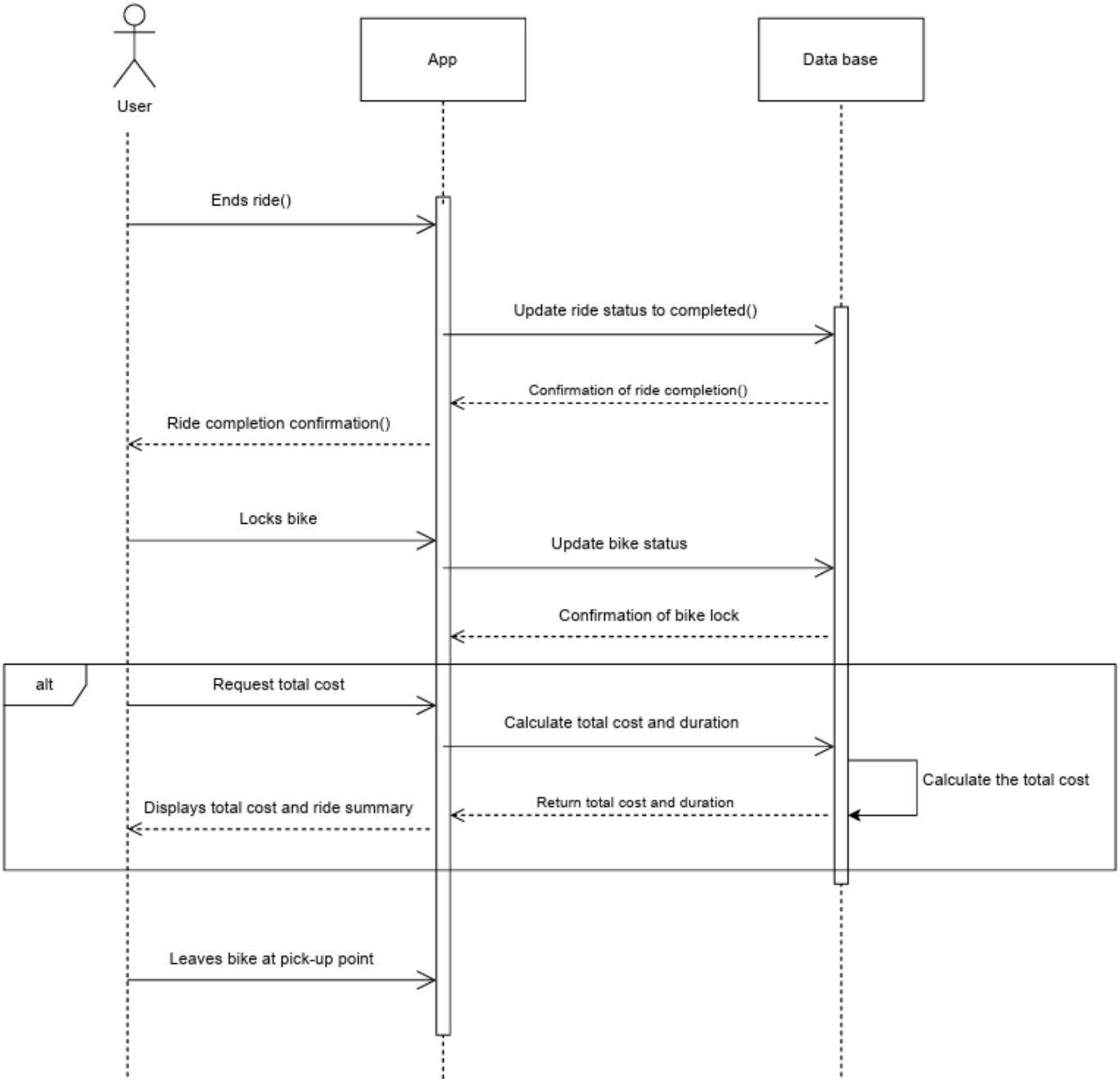
8.4. Sequence Diagram of Navigation Assistance



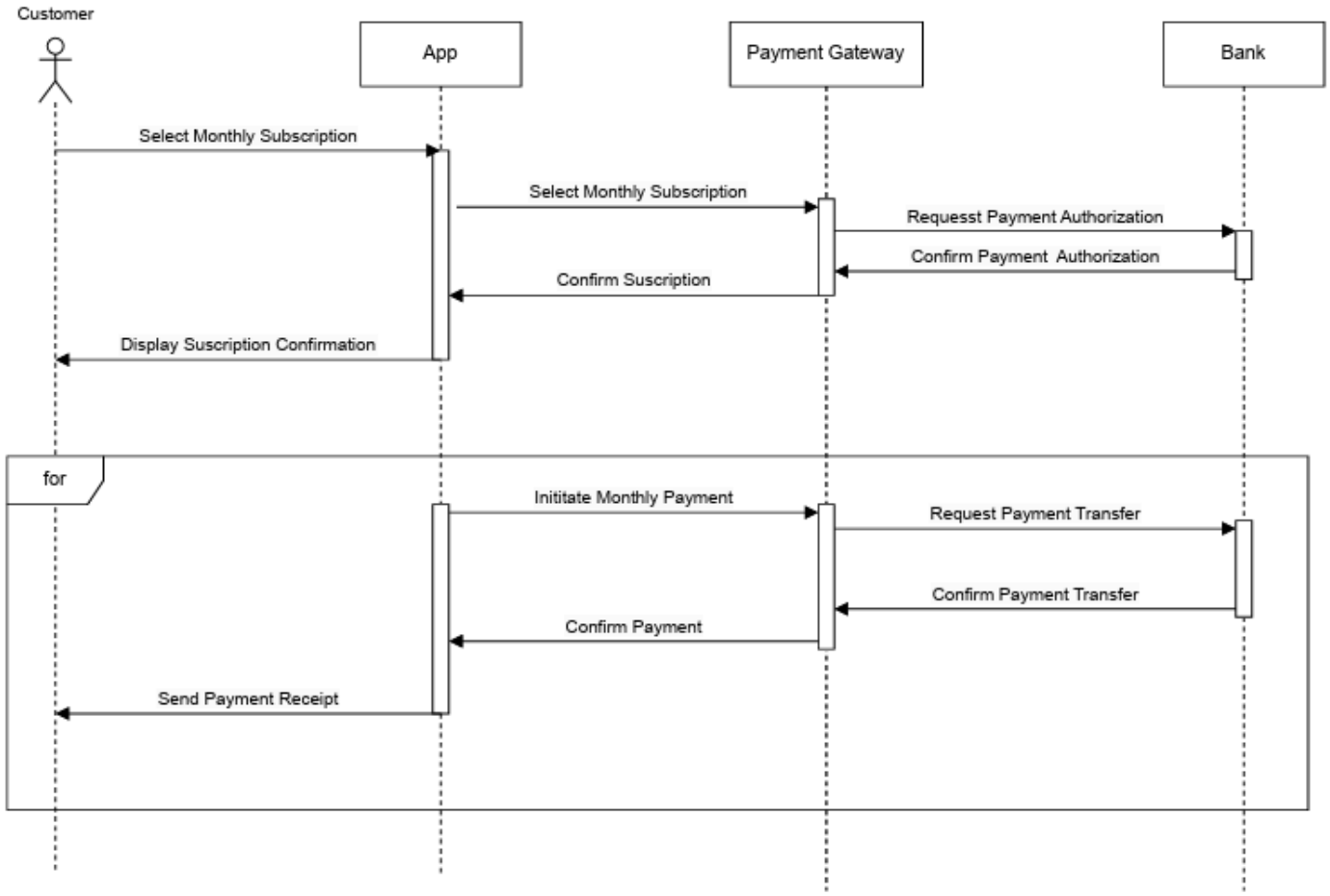
8.5. Sequence Diagram of Monthly Rental Service



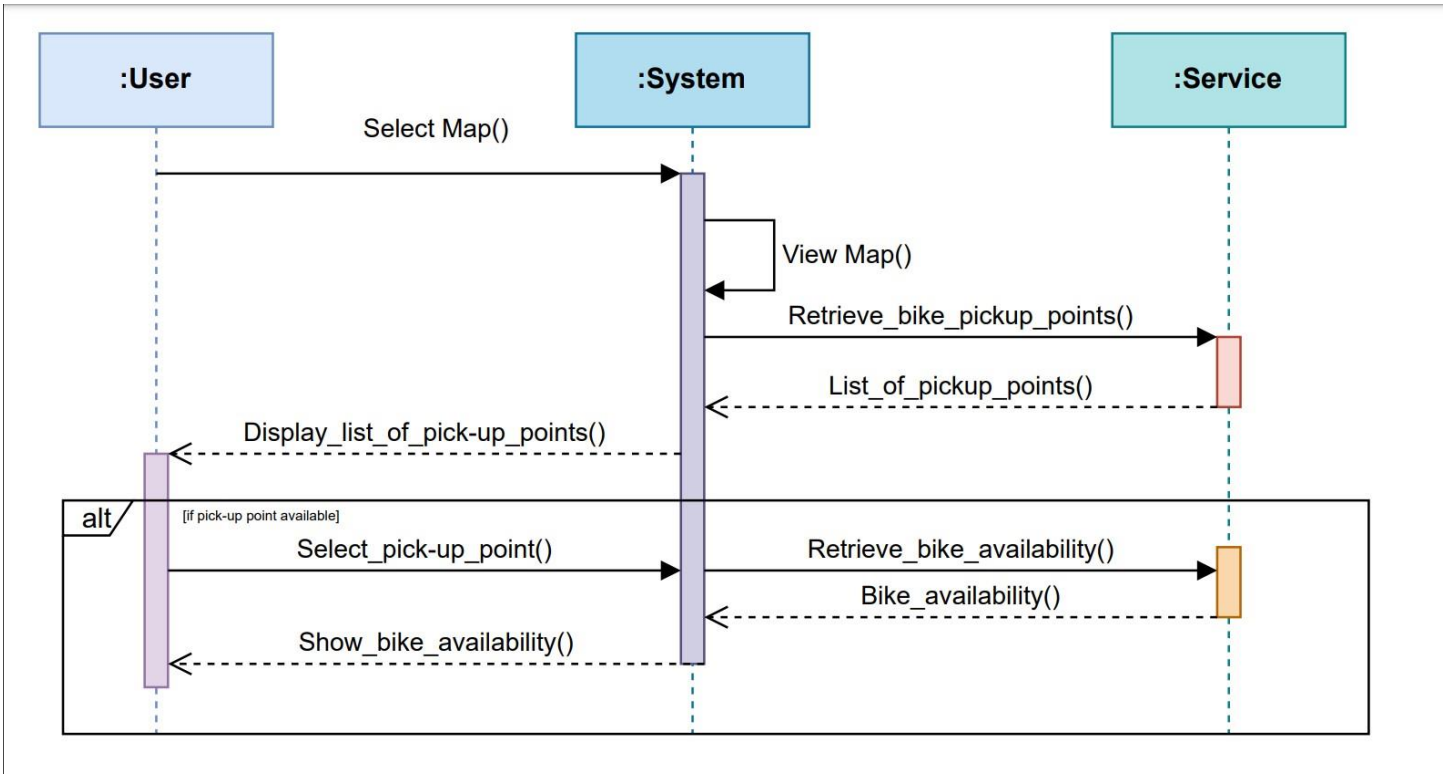
8.6. Sequence Diagram of Ending The Ride



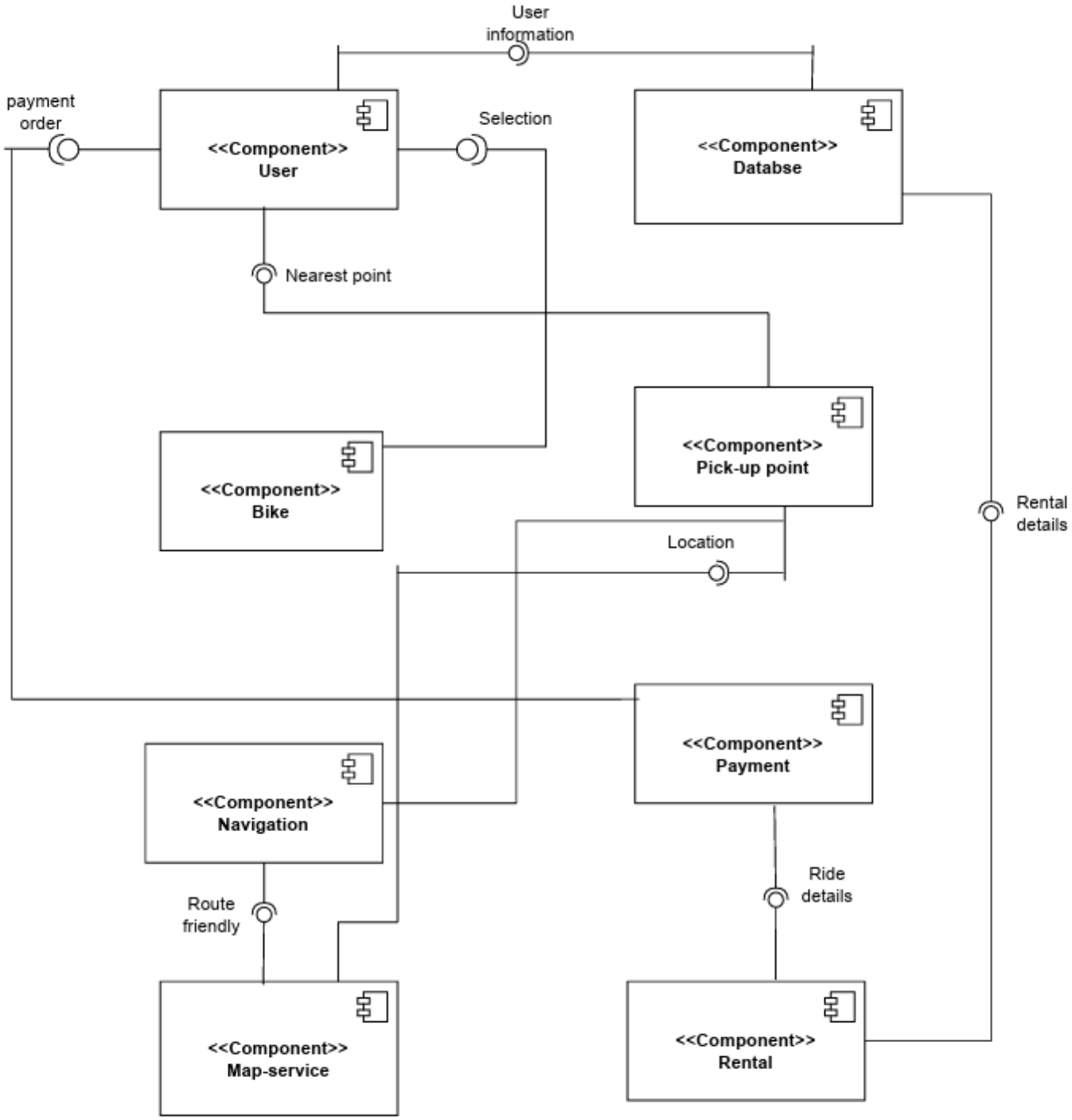
8.7. Sequence Diagram of Monthly Subscription Plan



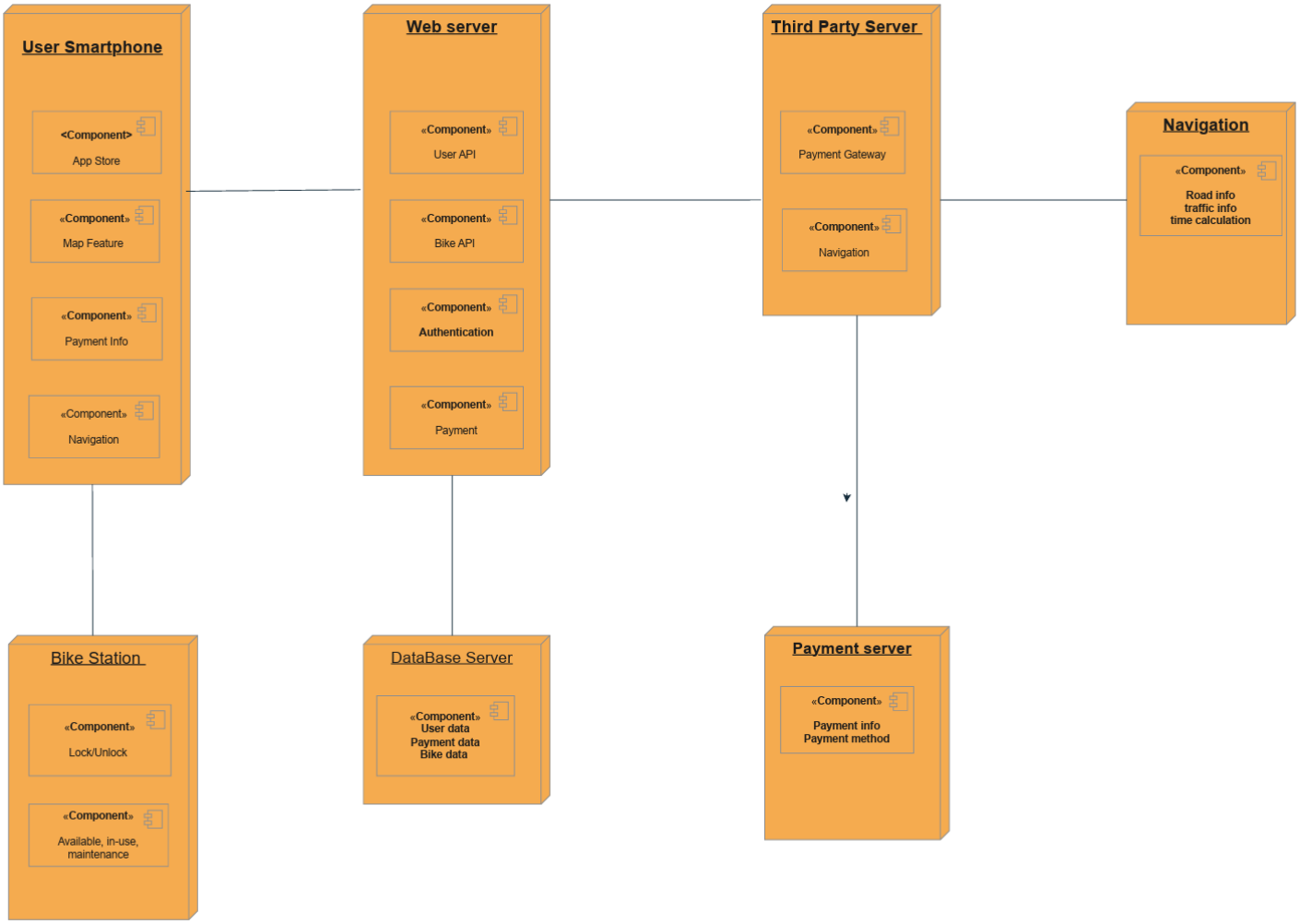
8.8. Sequence Diagram of Finding Nearest Bike Pick-up Point



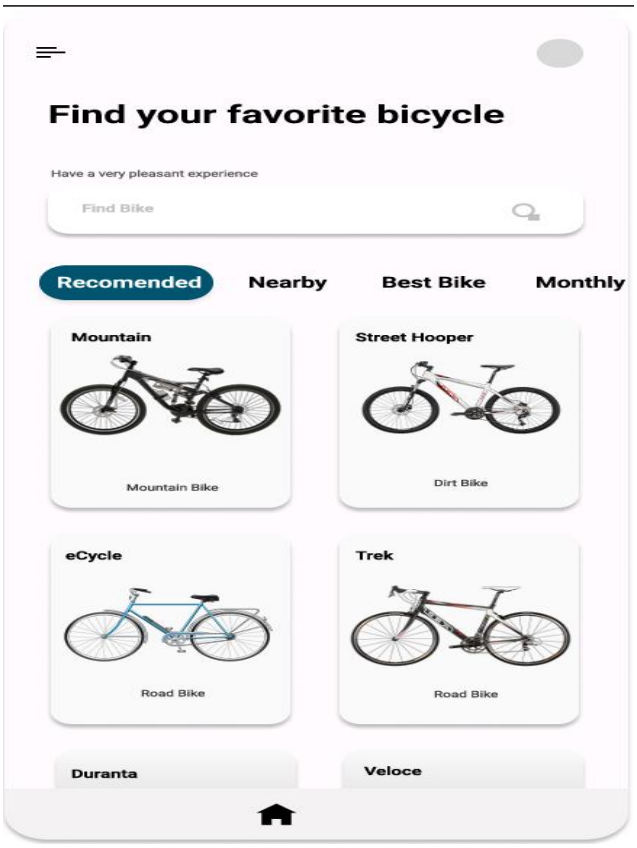
9. Component Diagram

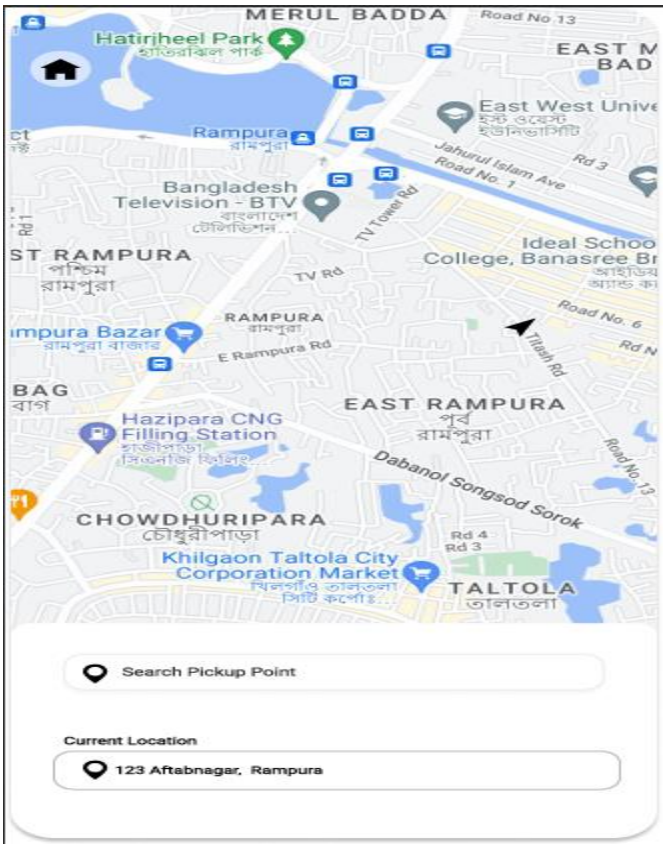


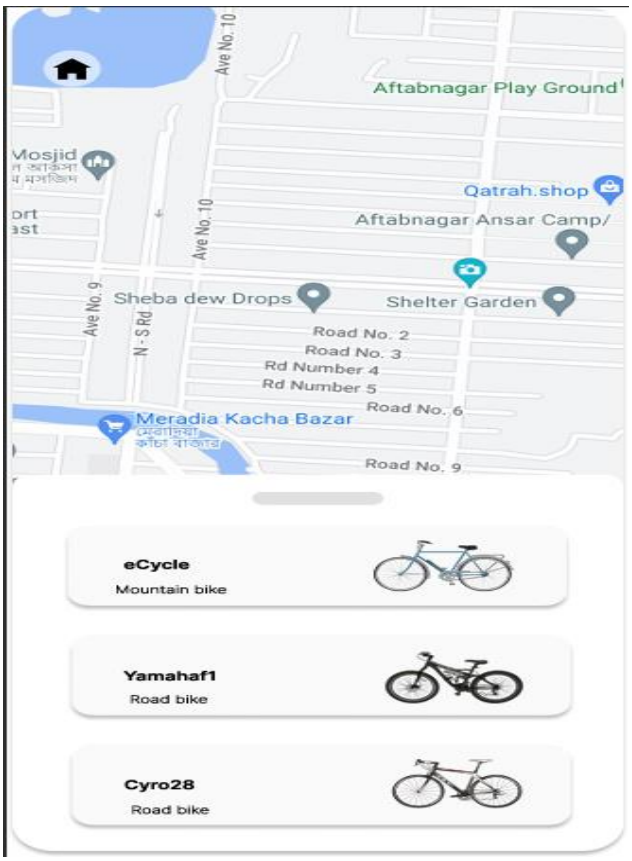
10. Deployment Diagram

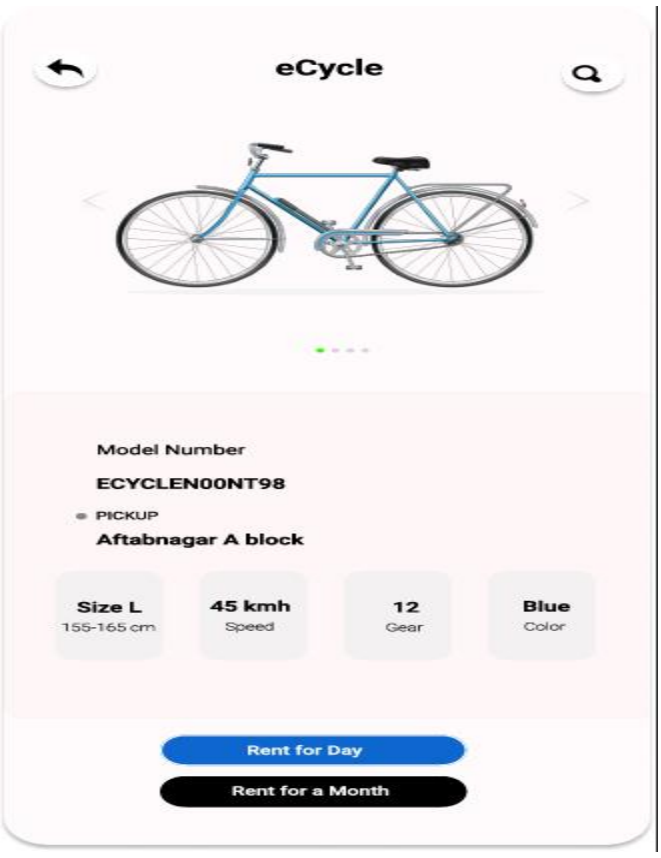


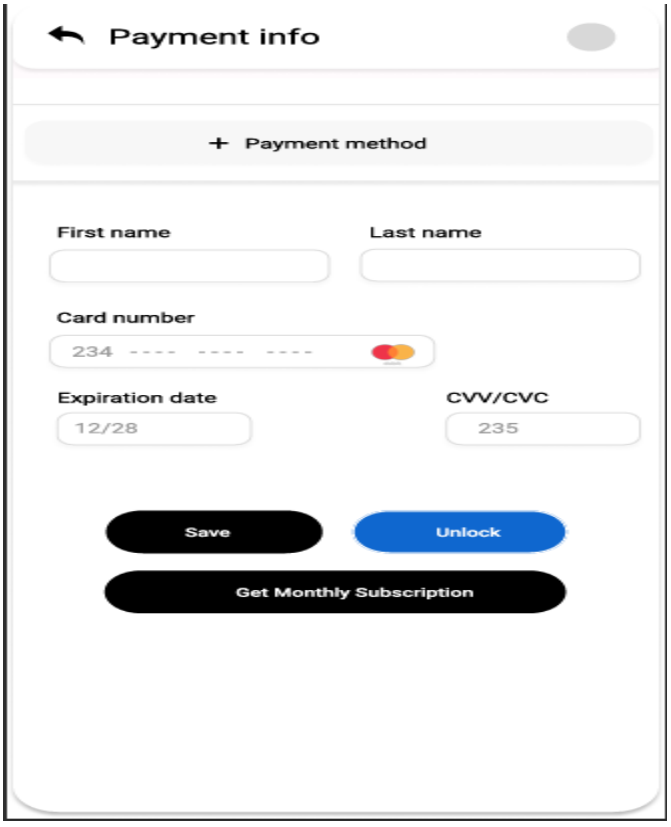
11. User Interface



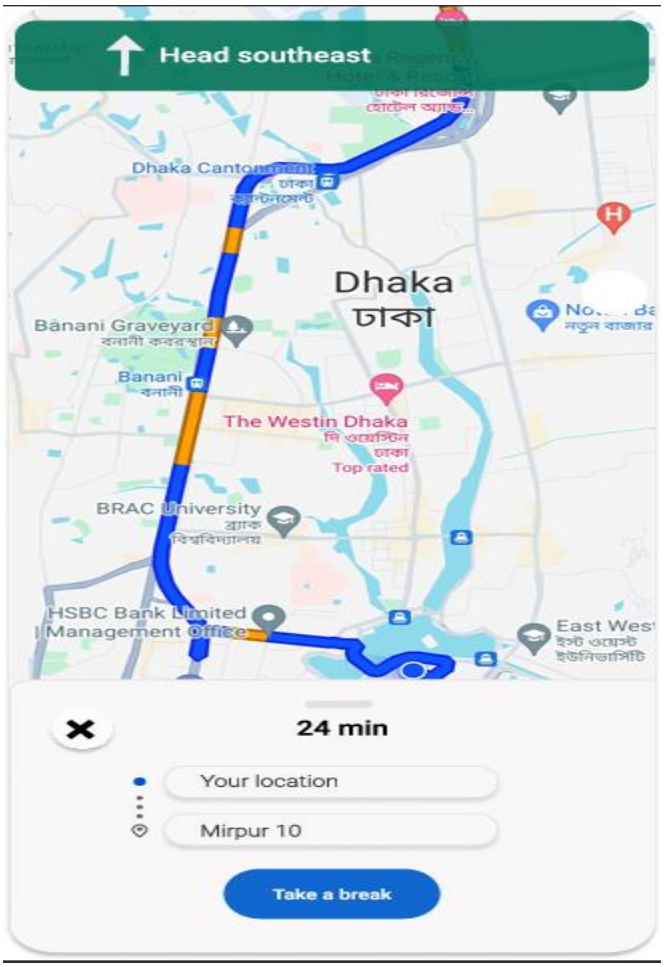


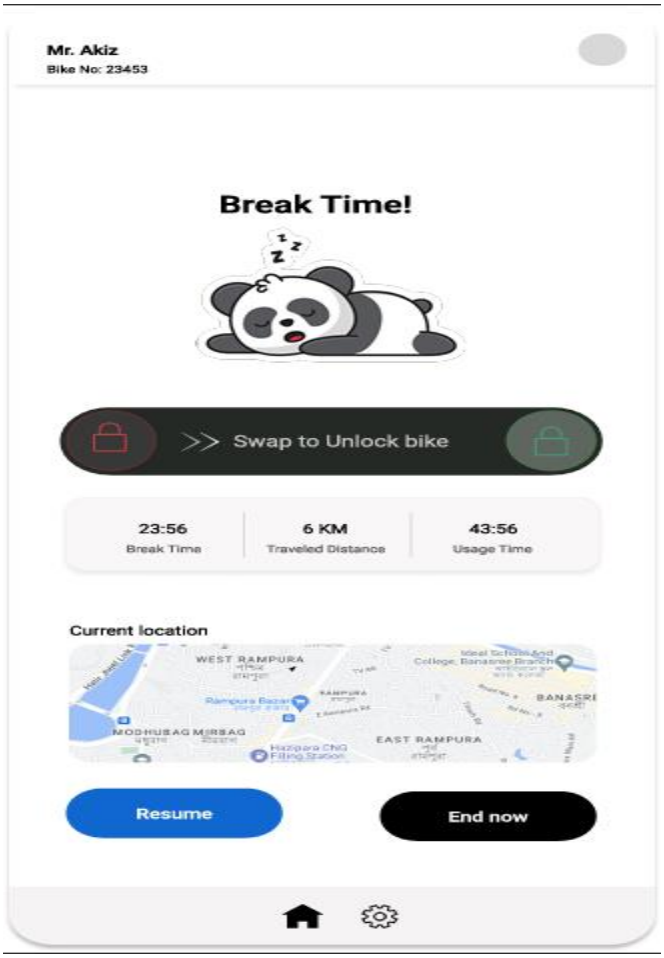


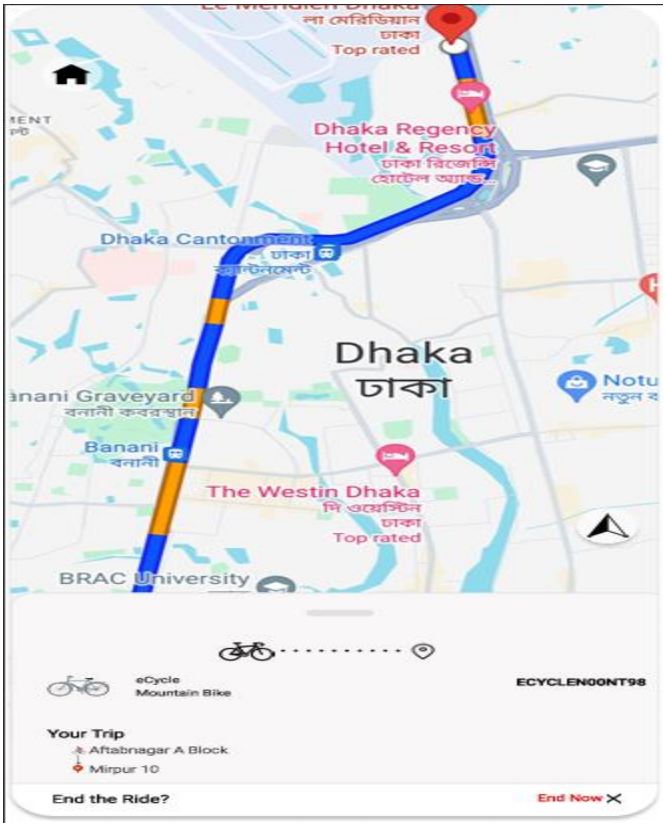



Payment info
+ Payment method
First name
Last name
Card number
234 ---- ---- ----
Expiration date
12/28
CVV/CVC
235
Save
Unlock
Get Monthly Subscription


Choose Your
Monthly Subscription Plan
Mountain Bike
77$/month
Road Bike
54$/month
Dirt Bike
66$/month
Back
Cancel


Head southeast
Dhaka
ঢাকা
Bānani Graveyard
Banani
The Westin Dhaka
Top rated
BRAC University
HSBC Bank Limited
Management Office
24 min
Your location
Mirpur 10
Take a break

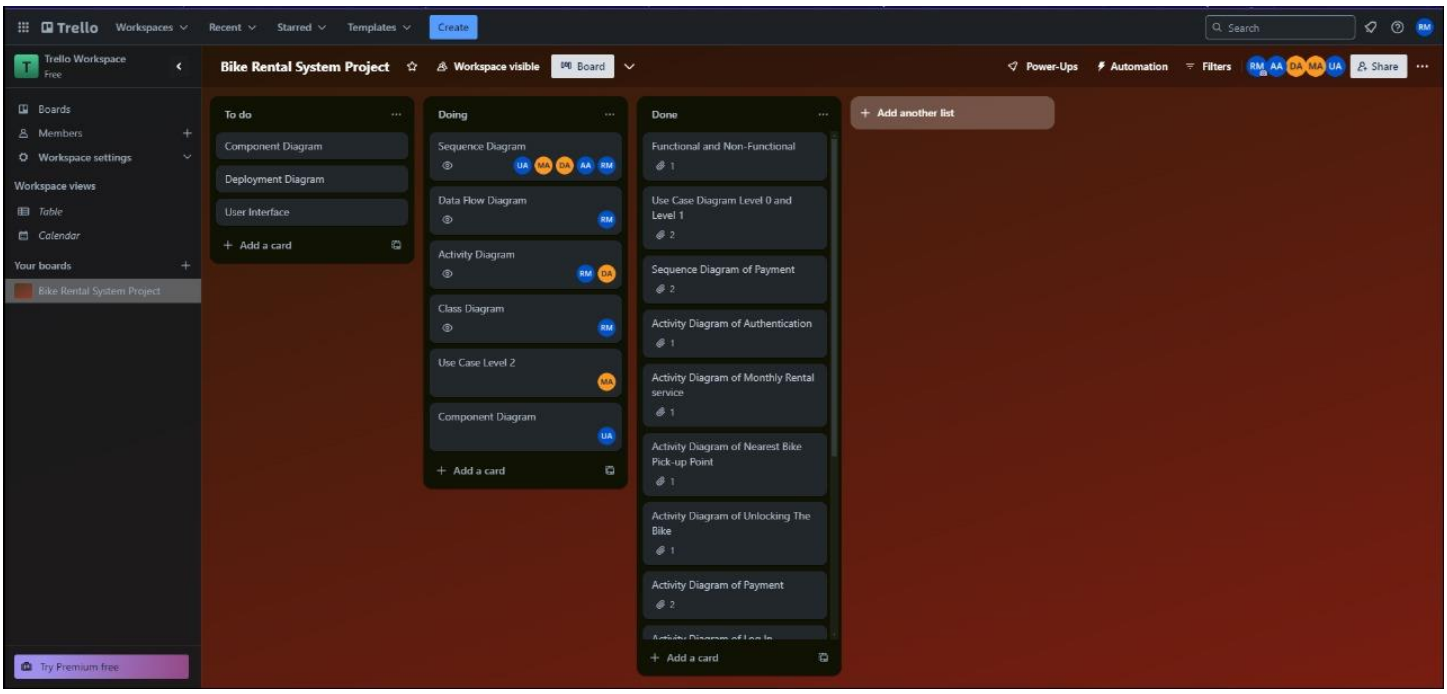

Mr. Akiz
Bike No: 23453
Break Time!
Swap to Unlock bike
23:56
Break Time
6 KM
Traveled Distance
43:56
Usage Time
Current location
Resume
End now


Top rated
Dhaka Regency Hotel & Resort
Dhaka Cantonment
Dhaka
ঢাকা
Banani Graveyard
Banani
The Westin Dhaka
Top rated
BRAC University
eCycle
Mountain Bike
ECYCLEN00NT98
Your Trip
Aftabnagar A Block
Mirpur 10
End the Ride?
End Now


Mr. Akiz
Bike No: 23453
Swap to lock bike
45$
Total amount
1:43:34
Total Ride time
45 KM
Traveled total km
Continue to Payment


Choose Your
Monthly Subscription Plan
Mountain Bike
77$ for a month
Road Bike
54$ for a month
Dirt Bike
66$ for a month

12. Project Work Responsibilities



Umme Aiman Promi	Component Diagram, Deployment Diagram
Abdul Muhaimin Ibne Ali	Sequence Diagram, Deployment Diagram
Dipraj Malaker	Activity Diagram, Sequence Diagram of Finding Nearest Bike Pick-up Point, Project Report
Md. Touhidul Islam Alif	Use Case Level-2, Sequence Diagram of Selecting a Bike & Monthly Subscription Plan, Activity Diagram of Monthly Subscription Plan, User Interface
Rafid Mubarrat	Requirements, Use Case Level 0 & 1, Data Flow Diagram, Class Diagram, Activity Diagram of Payment, Sequence Diagram of Payment