RoutEase Project



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Chapter 1

MILESTONE 1

1.1 Abstract

Student bus services are widely deployed in universities around the world because they provide cost-effective and economic student transportation. However, from a passenger point of view urban bus systems can be complex and difficult to navigate in case of person accidentally miss the bus or in case of bus late. The objective of this project is to build Transport Navigation System to provide ease to university students and faculty to locate the bus. We present REase (RouteEase), a reality-aware Student bus navigation system for bus students with the ability to recognize and track the physical transport i.e buses

1.2 Introduction

In Student bus navigation system, the student will just sign up the system make account, log in the system and view all routes current location. Most of the time, buses are susceptible to delay and temporary rerouting due to traffic congestion and construction work. Because of this buses take longer route and take long time than usual. And student on their stops unknowingly wait that bus and their important waste in waiting. This system provide a huge ease to the student in this aspect and student get all this information from the system and then take decision accordingly.

1.3 Approch

Agile methodology will be adopted in our project. As Agile is an iterative approach to project management and software development that helps teams deliver value to their customers faster and with fewer headaches. Instead of betting everything on a "big bang" launch, an agile team delivers work in small, but consumable, increments.

The Key Values and Principles of the Agile Manifesto

• Individuals and interactions over processes and tools.

- Working software over comprehensive documentation.
- Customer collaboration over contract negotiation.
- Responding to change over following a plan.

1.4 Requirements

Requirements for REase project both functional and non-functional will be accommodate.

1.4.1 Functional Requirements

1.4.1.1 User

Here we have functional requirements given below in user perspective:

- System shall allow the user to create his her Account and Sign-in.
- System shall allow admin to Add buses and assign routes to the buses their starting and destination point.
- System shall allow admin to enter buses GPS addresses for their tracking.
- System shall allow user to search their required route.
- System shall allow user to view the current location of their required route.
- System shall allow the user to logout from the system.

Optional

• Our system display the time how much route has currently far from the user stop.

1.4.2 Non-Functional Requirements

Here system's non-functional requirements are given below:

1.4.2.1 Responsive

Our system must be responsive as each request will be accommodate within 2 seconds from backend side.

1.4.2.2 Performance

Our system must perform well as it handles ten thousand users per second.

1.4.2.3 Security

Our system must be secure as credentials of its users accounts. Not even the admin can see any password or any other details.

1.4.2.4 Capacity

Our system must handle ten thousand users at a time without any blockage.

1.4.2.5 Scalability

Our system must be horizontally scalable, must handle one million users in future as demand for this application is rapidly increasing with the passage of time.

1.4.2.6 Availability

Our system must be available twenty four hours to its users. It must never give downtime for any operation.

1.4.2.7 Reliability

Our system must show correct information to the user (i.e, bus route number, bus current location).

1.4.2.8 Usability

System must be usable as it displays text, images and easy to understand GUI as it will be user-friendly that any lay man can use it with just having the knowledge of typing.It must be user-friendly as it is interactive, good contrast of text color with background attractive layout.

1.4.2.9 Recoverability

Our system must be able to recover itself in case of any unforeseen circumstances.

1.4.2.10 Manageability

Our system must be manageable as there will be a management team always to look up or monitor each and everything concerning critical health issues. In case of any failure the team will debug, analyze and understand the root cause of failure for improving its performance..

1.4.2.11 Data Integrity

Our system must provide data integrity.

1.5 Features

Here we have some features that we will accommodate in our Chat App.

- Simple log-in. Most of the apps today require some kind of sign-up and sign-in
- Data security and encryption
- Dark and light modes
- expanding and contracting map
- mobile app

- Platform Availability
- Performance

1.6 Tools and Technology

Tools and Technologies that are gonna be use in this projects are:

- HTML,CSS
- React JS
- Adobe XD
- WAMP Server
- UI/Ux

1.7 Project Workflow

- Use cases and models
- UI/UX
- ERD
- ullet Functionality Implementation
- Testing
- Documentation Report
- POC

1.8 References

Google Map

1.9 Feasibility Report

1.9.1 The task to be under taken

The project is to develop a real time platform that provide students their required bus route current location and developing an interactive user interface. We present REase (Route Ease), a reality-aware bus navigation system for students with the ability to recognize and track the physical public transport i.e buses.

1.9.2 Benefits

- The Students bus Navigator "REase" track the location of buses and provide real-time updates to the students. The system allow students to track buses in real-time, making sure they know exactly when the bus reached currently.
 - tracking systems are a great way to increase efficiency and make sure your buses run on time
- Students, Workers that used university transport daily anxious about when will bus come or may the bus passes from the stop. They have a great ease from this system they know the current location of the bus and have estimate when will bus arrived and manage all his activities accordingly.
- In case of bus pass from their stop ,students get information from the app and will wait for the next possible route if available.

1.9.3 A Preliminary Requirements Analysis

The system needs to meet the following functional requirements:

- 1. Mobile App Interface
- 3. Administrator Side
 - Allow admin add buses and assign routes to the buses their starting and destination point.
 - Allow admin to enter buses GPS addresses for their tracking

4. Public Side

- allow the user to create his her Account and Sign-in.
- Display interactive User interface
- Allow user to search their required route.
- Allow user to view the current location of their required route.

Optional

• Our system display the time how much route has currently far from the user stop.

1.9.4 Technical Requirements

Tools and Technologies that are gonna be use in this projects are:

- HTML,CSS
- React JS
- Adobe XD
- WAMP Server
- UI/Ux

1.9.5 Suggested Deliverables:

1. Requirements Analysis:

a document and a presentation to go over the formal requirements of the project, both functional and non-functional. This deliverable ensures that the Group is working on a system that closely matches to the wishes of the Client. This deliverable gives the Client a chance to modify and correct items that were mis-communicated or missed out before allowing the Group to proceed further in the design.

2. Design Document:

a document and a presentation to go over the design of the system. This is the Group's opportunity to go over how the project is to be implemented to the Client. This deliverable is done by the more technical and experienced in the Group, based on the understanding of the requirements established in the previous deliverable.

3. Source Code:

a document, presentation along with the source code of the final completed project. This final deliverable wraps up and concludes the project. In this deliverable, the Group delivers the final implementation based on the requirements specified and the design developed in previous stages. The system would have been tested thoroughly with unit tests and with a final acceptance test and would be ready for deployment to the production system.

1.9.6 Software Development Process:

The project will undertake Agile methodology as there is a well-defined set of requirements. As the Client has very specific needs for the system but changes in our system features expected during the development so, Agile methodology is suited for our system. Agile methods are based on the following principles:

- Rapid response to any changes with the assistance of adaptive planning.
- Joint development of requirements.
- Rationalization of duties performed by the members.
- Step-by-step software development.

1.9.7 Outline Plan (Principal activities and Milestones)

Milestone 1 -Requirement Analysis (Draft): An initial draft of the requirements analysis should be done as Milestone 1.

Milestone 2 -Requirement Analysis (Final): The final draft of the requirements analysis as well as feasibility study should be done for Milestone 2. In addition, a presentation will be prepared as a part of this milestone.

Milestone 3 –Use cases and scenarios: Use cases will be made in Milestone 3.

Milestone 4 –UI/UX: In this milestone user interface will be designed.

Milestone 5 –UMLUML and implementation will be done in Milestone 5.

Milestone 6 –POC: Coding and functionality implementation i.e., Proof of Claim(POC) will be done in Milestone 6.

Milestone 7 – Testing: Testing, Debugging and Integration of project will be done in this Milestone.

Milestone 8 – Project Demonstration (Deployment): The project source code should be handed over to the Client for the final milestone. A presentation will also be delivered.

1.9.8 Visibility Plan:

External: The group will conduct Weekly meeting with Client (i.e., Teacher) in lab. If situations arise or if a problem needs to be addressed between the meetings, the Group will conduct any further necessary communication via email. Because agile model will be used, a report will be issued to the Client at the end of every step to ensure that both parties are in-sync and to minimize any miscommunication in the requirements.

Internal:The Group will meet daily to discuss progress and problems. Meeting minutes will be kept track of and sent to all members of the Group for reference. Any additional communication will be done via email or through other collaboration tools such as document sharing. In addition, the source code will be stored on drive as repository. All source code will be documented carefully before being submitted to the repository. The progress of the principal activities and major milestones will be closely monitored and compared with the schedule. During the regular meetings, progress will be compared to a Gantt chart, which will be drafted after the completion of the requirements study when the tasks are identified and assigned.

1.9.9 Risk Analysis

Changing Requirements:Risk: The Client may have different ideas about the system during the course of the project. Depending on the situation, the changes that the Client wishes to have implemented may require little or major changes to the architecture. Solution: To reduce the possibility of this occurring, the Group needs to establish a clear visibility plan with the Client.

Incomplete Requirements:Risk: It is possible that requirements may be implied but not discussed or misunderstood. This frequently occurs after meetings. Solution: The Group's interpretation of the Client's requirements will be presented back to the Client to get a confirmation on whether the Group has understood the Client. Frequent client updates and a high level of visibility will also help call attention to any misunderstandings.

System Integration: Depending on the level of access to the servers that the Group receives, the Group may need to work on the system offline and eventually integrate with the production system when it is ready and thoroughly tested. Due to different software configuration, there may be unpredictable obstacles.

Solution: To ensure a smooth system integration, the Group needs to be aware of as much about the configuration as early as possible.

Non-functional Requirements:Risk: Similar to incomplete requirements, non-functional requirements is something that has not been brought up in the initial meeting with the Client. These include requirements on the number of users that the system expects to support concurrently, and the response time of the database lookup. Solution: A follow up meeting is needed to specify the non-functional requirements.

Human resources:Risk: The Group is relatively small consisting of only 3 members, some members are not technically oriented and almost all members have limited knowledge of relevant web-technologies. Solution: For these reason the Group acknowledges that a slow design and implementation phase may be inevitable, and are planning accordingly.

1.9.10 Conclusion:

Based on the analysis of this feasibility study, the Group has collectively agreed that this project IS FEASIBLE and the group is WILLING to take on the afore mentioned project. The benefits are significant enough to justify the development effort required

Chapter 2

MILESTONE 2

2.1 Use Cases

2.1.1 Student Log-In

Name	Log-In
Participating Actor	Student
Goals	Student can successfully log-in to the system
Triggers	Request to log in
Pre-Condition	Student have authentic ID and password
Post-Condition	Student access the system and its functionalties
Basic Flow	
	• enter name
	• enter password
	• Request to log in
Alternate flow	Reset Password or contact to admin
Qualities	System must respond within 3 to 5 seconds.
	System validate correct ID and password.
Exceptions	wrong ID or password

2.1.2 Admin Log-In

Name	Log-In
Participating Actor	Admin
Goals	Admin can successfully log-in to the system
Triggers	Request to log in
Pre-Condition	Admin have authentic ID and password
Post-Condition	Student access the system and its functionalties
Basic Flow	
	• enter name
	• enter password
	• Request to log in
Alternate flow	Reset Password
Qualities	System must respond within 3 to 5 seconds.
	System validate correct ID and password.
Exceptions	wrong ID or password

2.1.3 Search Route

Name	Search Route
Participating Actor	Student, Admin
Goals	Search the particular Route
Triggers	Search the route by scrolling drop down and select
	your route
Pre-Condition	log into the system
Post-Condition	View your route bus location and stops
Basic Flow	
	• log into the system
	Search route from drop down menu
	• Select Route
Alternate flow	Manually Search by expanding map
Qualities	System must respond within 3 to 5 seconds.
	show correct routes name
Exceptions	Search route not available.

2.1.4 View Stops

Name	View Stops
Participating Actor	Student, Admin
Goals	View stops of the selected routes
Triggers	Search the route by scrolling drop down and select
	your route
Pre-Condition	log into the system, Search Route, Select route
Post-Condition	View the stops of selected routes
Basic Flow	
	• log into the system
	Search route from drop down menu
	• Select Route
Alternate flow	N/A
Qualities	System must respond within 3 to 5 seconds.
	show correct routes name
Exceptions	Search route not available.

2.1.5 View current location of routes

Name	view current location of routes
Participating Actor	Student, Admin
Goals	View current location of routes
Triggers	Search the route by scrolling drop down and select
	your route
Pre-Condition	log into the system
Post-Condition	View your route bus location
Basic Flow	
	• log into the system
	Search route from drop down menu
	• Select Route
Alternate flow	None
Qualities	System must respond within 3 to 5 seconds.
	show correct location of route on map
Exceptions	Search route not available.

2.1.6 Add Buses Routes

Name	Add Buses Routes
Participating Actor	Admin
Goals	Add bus routes in the system
Triggers	Request to Add Bus
Pre-Condition	log into the system, have bus tracker ID
Post-Condition	Bus show in the available routes
Basic Flow	
	• log into the system
	• Enter buses number and tracker ID
	• Click add to add the bus
Alternate flow	N/A
Qualities	System must respond within 3 to 5 seconds.
	Enter correct bus no and tracker ID
Exceptions	Search route not available.

2.1.7 Update Buses Routes

Name	Update Buses Routes
Participating Actor	Admin
Goals	Update bus routes in the system
Triggers	Request to update Bus
Pre-Condition	log into the system, have bus number ,tracker ID
Post-Condition	Bus show on the available routes
Basic Flow	
	• log into the system
	• Enter buses number
	Click to Update route
Alternate flow	N/A
Qualities	System must respond within 3 to 5 seconds.
	Enter correct bus no and tracker ID
Exceptions	N/A

2.1.8 Delete Buses Routes

Name	Delete Buses Routes
Participating Actor	Admin
Goals	Delete bus routes from the system
Triggers	Request to delete Bus
Pre-Condition	log into the system, have bus number ,tracker ID
Post-Condition	Bus not show on the available routes
Basic Flow	
	• log into the system
	• Enter buses number
	• Click on delete route
Alternate flow	N/A
Qualities	System must respond within 3 to 5 seconds.
	System validates bus number
Exceptions	N/A

2.1.9 Add Bus Stops

Name	Add Bus Stops
Participating Actor	Admin
Goals	Add stops in the route
Triggers	Request to Add stops
Pre-Condition	log into the system, have bus number
Post-Condition	Bus Stops of the corresponding route show on map
Basic Flow	
	• log into the system
	• Enter buses number
	• Enter their stops and highlight it.
Alternate flow	N/A
Qualities	show correct bus stops .
	System validates bus number
Exceptions	N/A

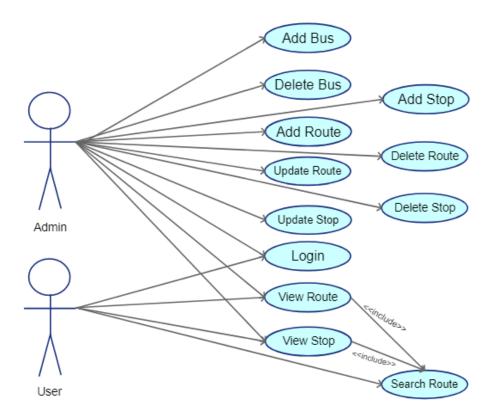
2.1.10 Update Buses Routes

Name	Update Bus Stops
Participating Actor	Admin
Goals	Update stops of the route
Triggers	Request to Update stops
Pre-Condition	log into the system, have bus number
Post-Condition	Updated Bus Stops of the corresponding route show
	on map
Basic Flow	
	• log into the system
	• Enter buses number
	• Update stops
Alternate flow	N/A
Qualities	show correct updated bus stops .
	System validates bus number
Exceptions	N/A

2.1.11 Delete Buses Stops

Name	Delete Bus Stops
Participating Actor	Admin
Goals	Delete stops from the route
Triggers	Request to delete stops
Pre-Condition	log into the system, have bus number
Post-Condition	Bus Stops of the corresponding route not show on map
Basic Flow	
	• log into the system
	• Enter buses number
	• Enter the stops
	• delete stop
Alternate flow	N/A
Qualities	show correct bus stops.
	System validates bus number
Exceptions	N/A

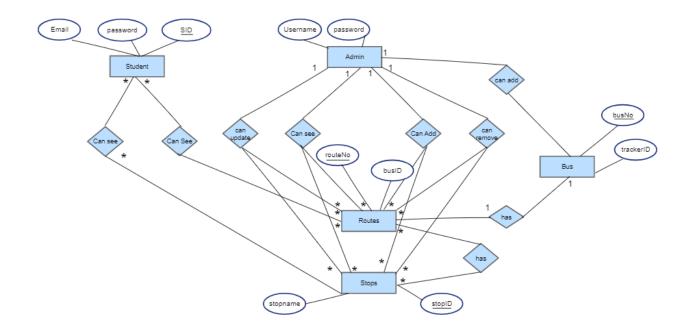
2.2 Use Case Diagram



2.3 Entity Relationship Diagram: Case Study

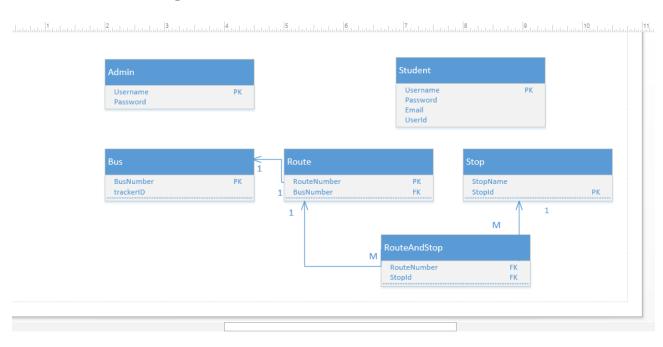
Identify the entities and relationships for the following description and draw and ERD diagram:

A student can view many routes and stops on the other hand one route or stop can be viewed by many students. Admin can add, update, remove or simply view many routes, buses and stops. One bus can handle one route similarly one route denotes one bus. One route can entertain many stops and one stop can encounter many routes.

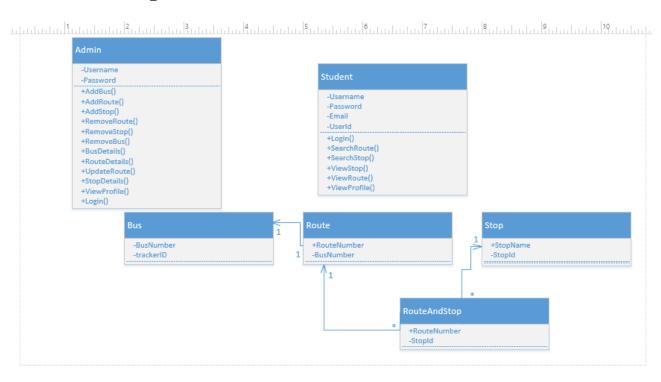


Activate Windows

2.4 Schema Diagram

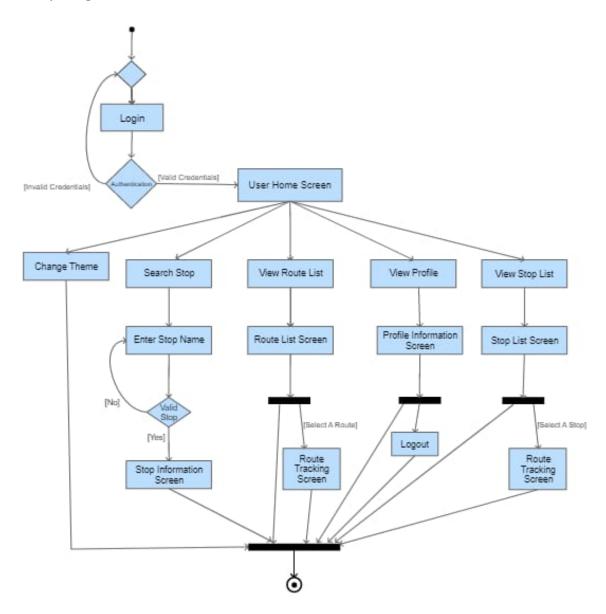


2.5 Class Diagram

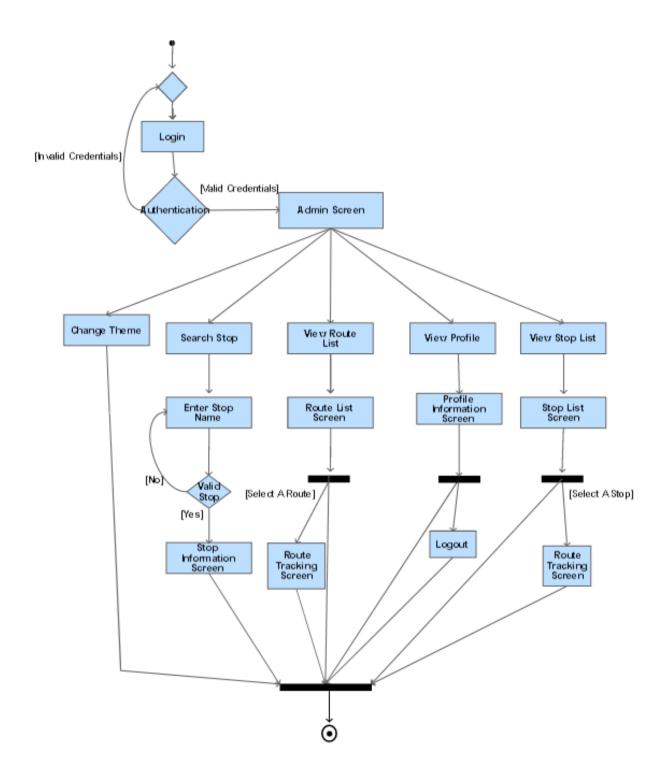


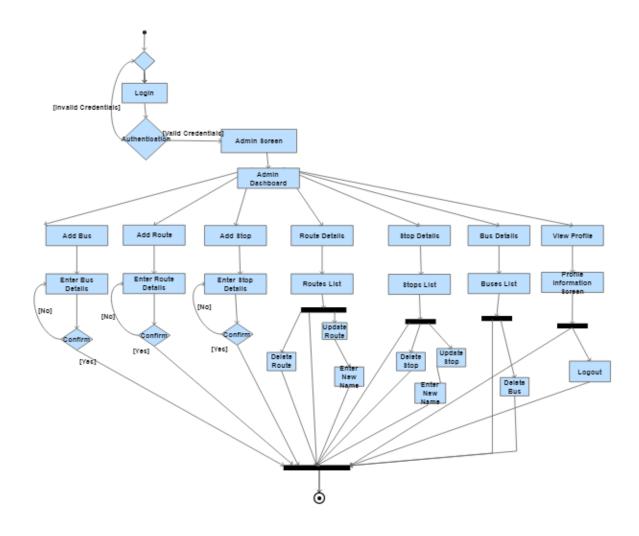
2.6 Activity Diagram

User Activity Diagram



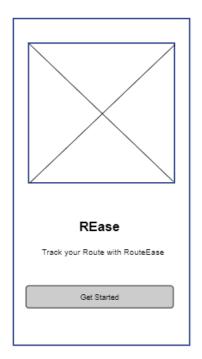
Admin Activity Diagram





2.7 Wireframes

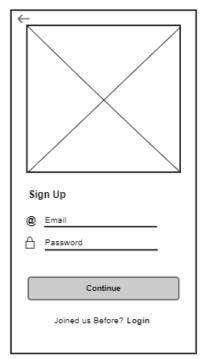
Get Started



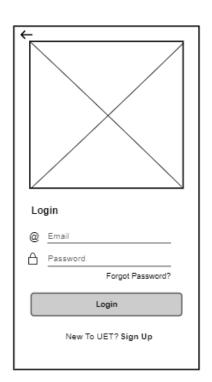
Find Your
University Routes
Here

Login Sign up

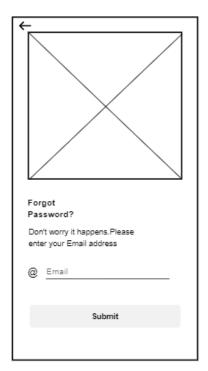
Sign Up



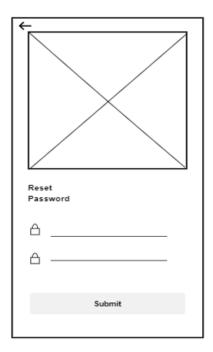
Log in



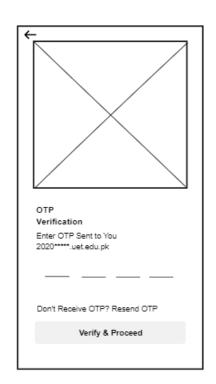
Forget password



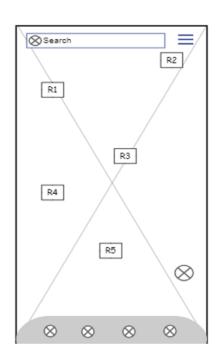
Reset Password



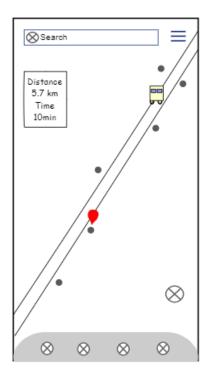
OTP Verification



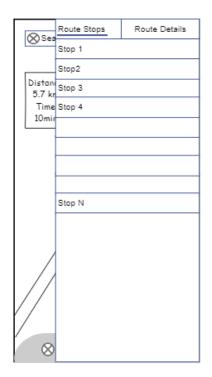
Home page



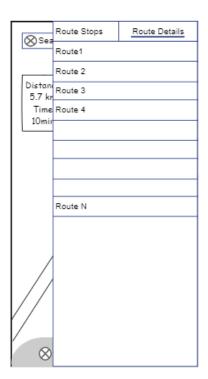
Search Route



Stops details



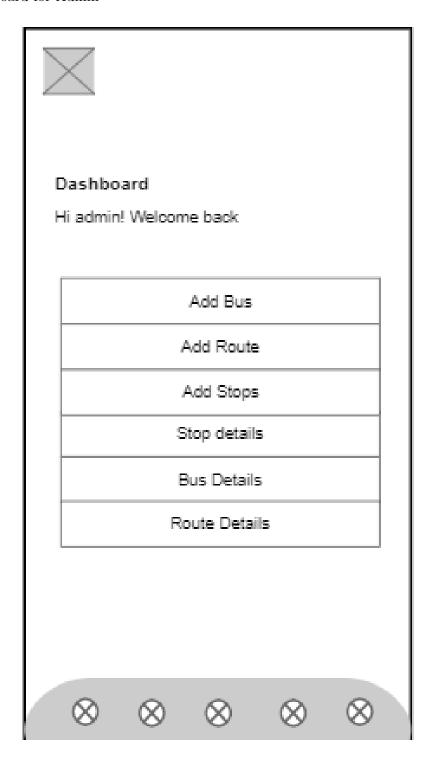
Route Details



Profile



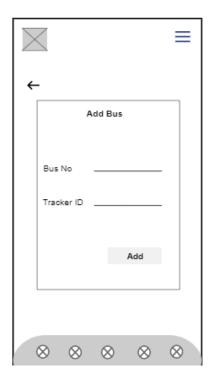
Dashboard for Admin



Update Route



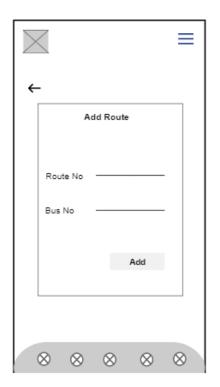
Add Bus



Add Stop



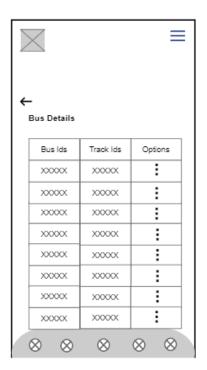
Add Route



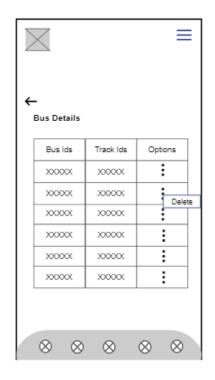
Enter details

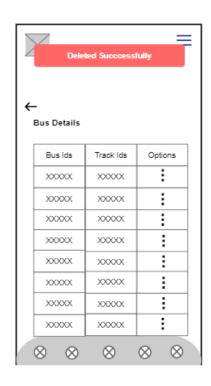


Bus Details

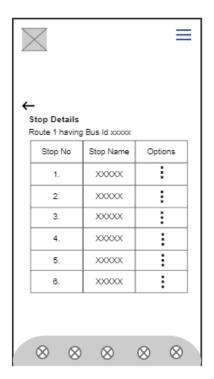


Delete Bus

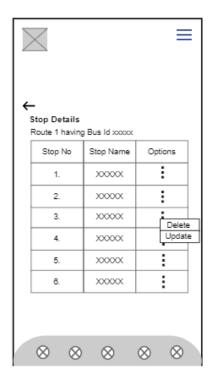




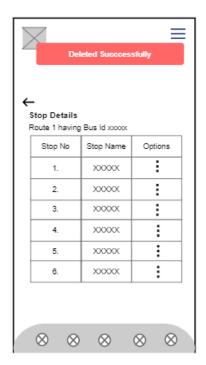
Stop Details



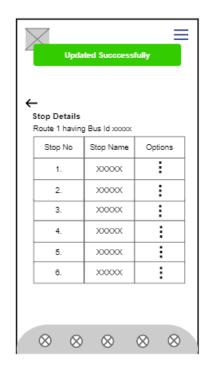
Stop Update/Delete



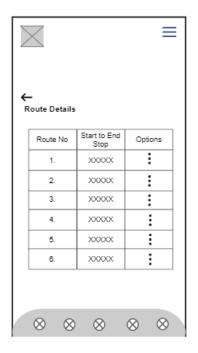
Stop Delete Successfully



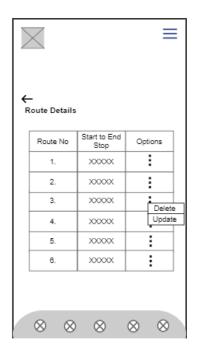
Stop Update Successfully



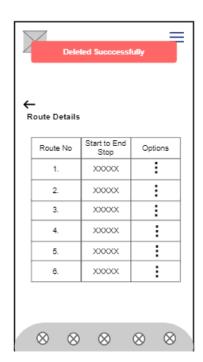
Route Details



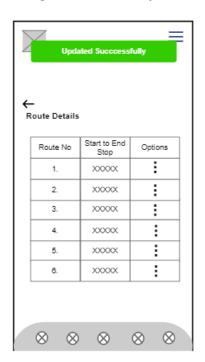
Route Update/Delete



Route Delete Successfully



Route Update Successfully



2.8 UI/UX

