



# Project Report On Bus Management System

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# Contents

<b>1</b>	<b>Introduction</b>	<b>2</b>
<b>2</b>	<b>Requirement Gathering</b>	<b>2</b>
2.1	Use Case Diagram . . . . .	7
2.2	Process Models: . . . . .	14
2.3	Data Modeling . . . . .	18
<b>3</b>	<b>SYSTEM DESIGN:</b>	<b>19</b>
3.1	Data Design . . . . .	19
3.2	UI Design . . . . .	20
<b>4</b>	<b>Implementation</b>	<b>27</b>
<b>5</b>	<b>Testing</b>	<b>27</b>
<b>6</b>	<b>Training and Maintenance</b>	<b>27</b>
6.1	Non-Functional Requirements . . . . .	27

# 1 Introduction

Our software project is called BUS-TICKET MANAGEMENT SYSTEM. Its an online web app designed to allow users to buy ticket online, and also allows BUS SERVICE Companies to manage various business processes and resources like buses, employees etc. Most companies like UNIQUE, ENA, and GREENLINE still conduct majority of their business processes manually, hence our software will create value in this market by automating most of these processes.

# 2 Requirement Gathering

We visited multiple Intercity Bus Service Company Offices in Sylhet, including: ENA, Unique, Greenline,

We analysed their As-is System by various Elicitiation technique:

1. Document Analysis: The documents gathered were :

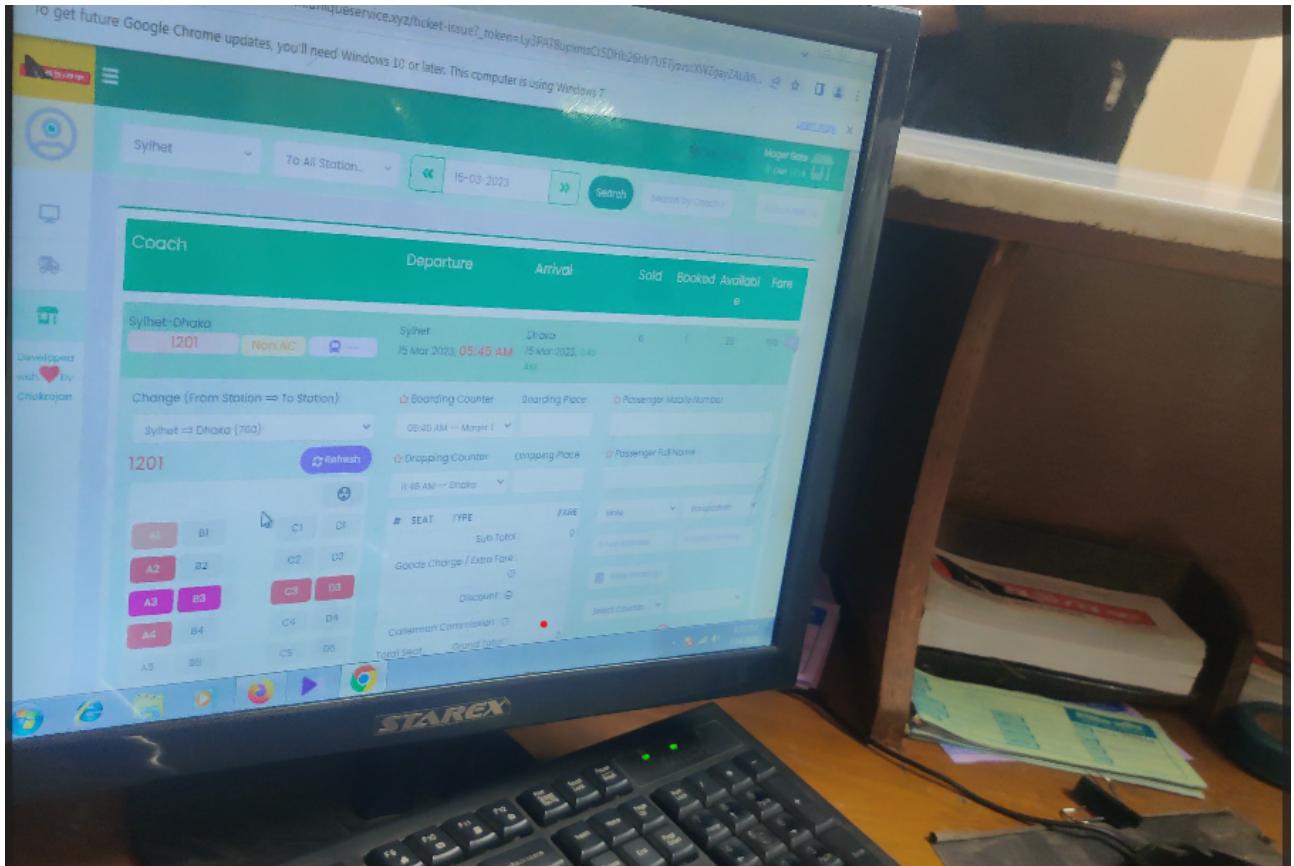


Figure 1: picture of existing ticket purchasing systems

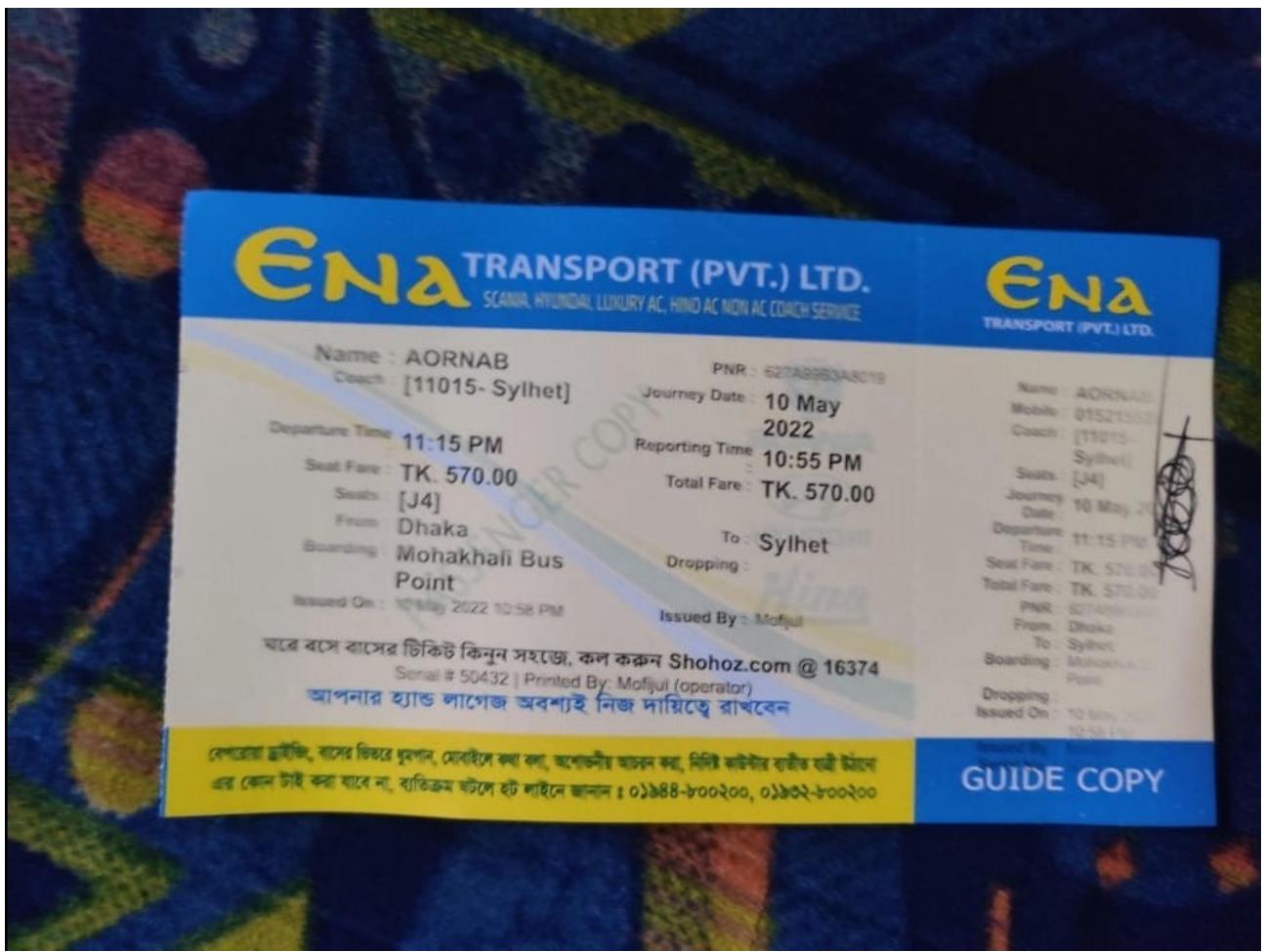


Figure 2: picture of Ticket



Figure 3: picture of Ticket



Figure 4: picture of ena bus route

2. Interview: click here to see Interview video



Figure 5: Interview with manager of unique counter at humayun chattar

And We interviewed a manager of Greenline Bus Service: click here to see Interview audio

We identified 2 main actors:

1. User representing the customer and passenger
  2. Admin representing the people handling the business management operations.
- Profile Management System: One of the functional requirements of our system is the users are allowed to login, register, and manage/edit their profile information. Our system also allows the admin to login, giving access to resource management and system parameters
  - Business Resource Management System: The System allows the Admin to manage Resources. Buses, Employees, Trips, and Bus Counters. These follow the basic CRUD system.
  - Ticket Purchasing System: Our System Allows Users to purchase Tickets online, by first invoicing their payment, and letting the Admin confirm the Payment Transaction before mailing the ticket to their email.

Expanding on the functional requirements, we get the following use cases:

## 2.1 Use Case Diagram

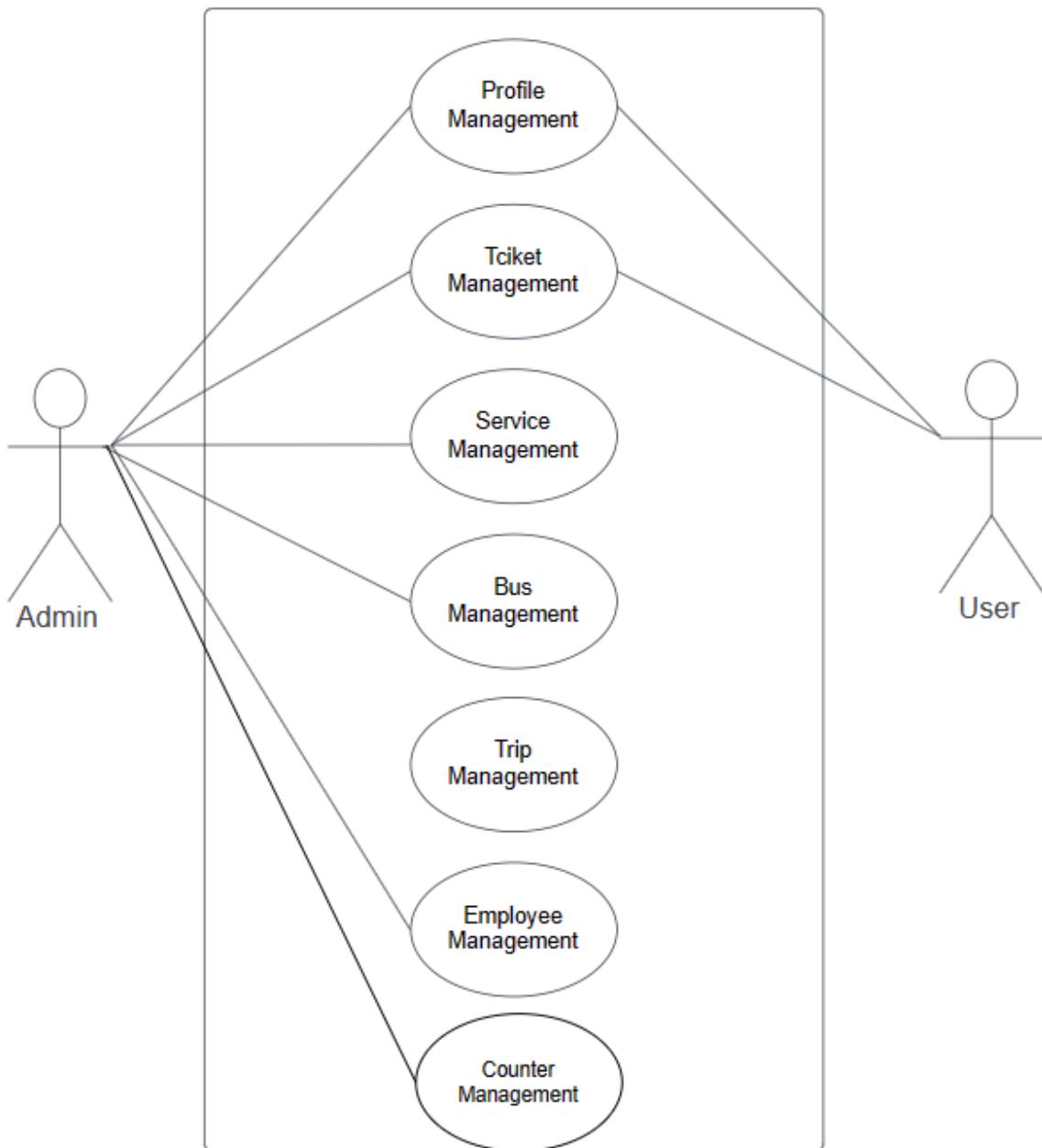


Figure 6: Usecase Diagram showing all the major processes

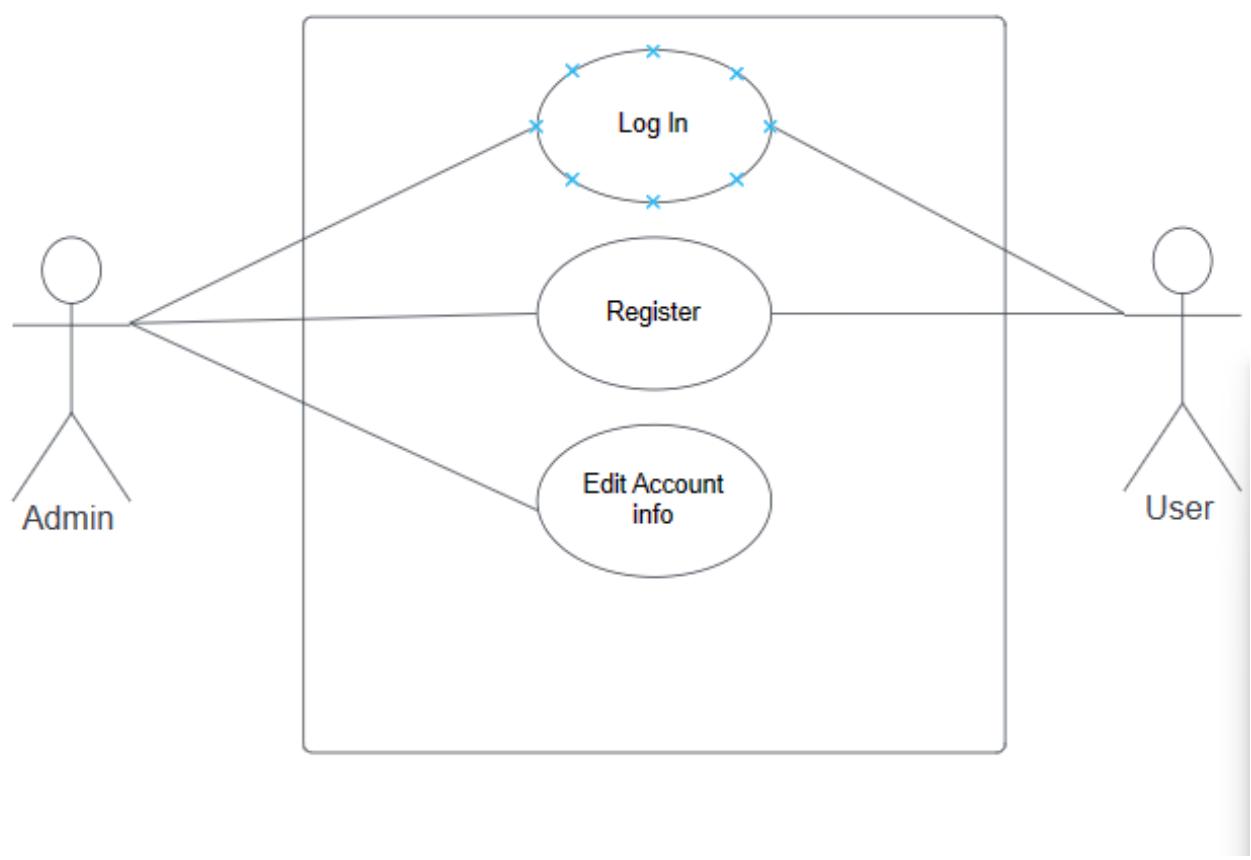


Figure 7: Usecase diagram for Profile Management

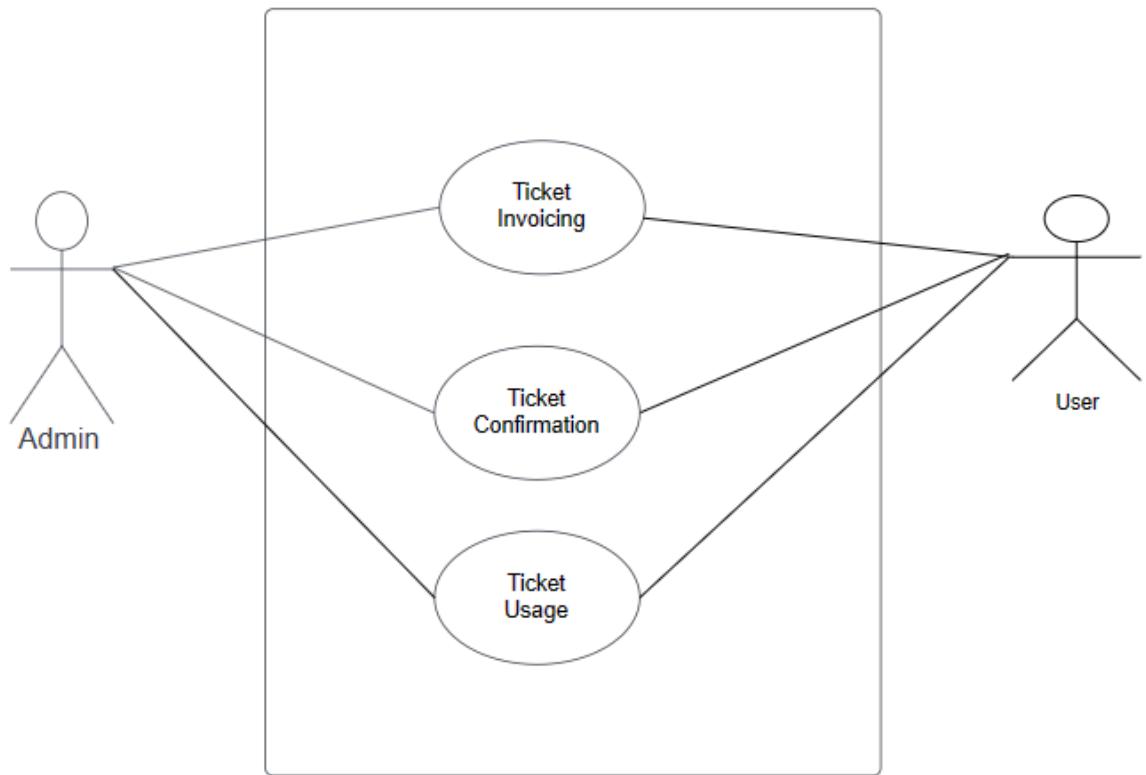


Figure 8: Use Case Diagram for Ticket Management

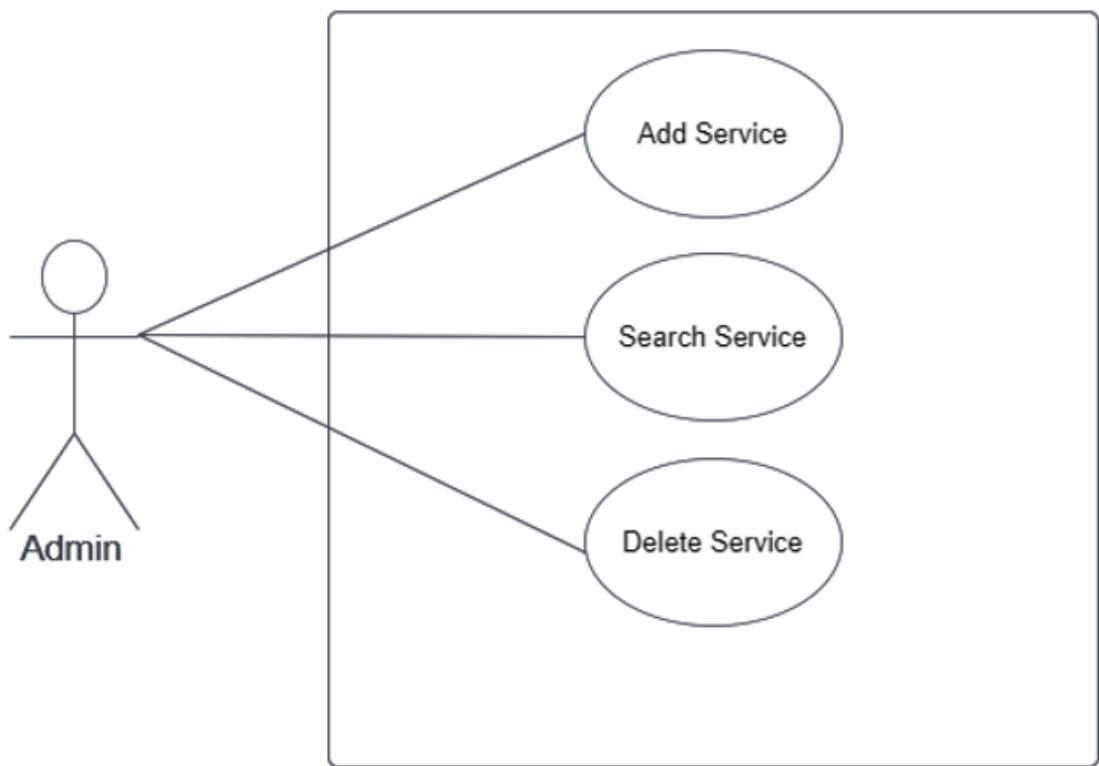


Figure 9: Use Case Diagram for Service Management

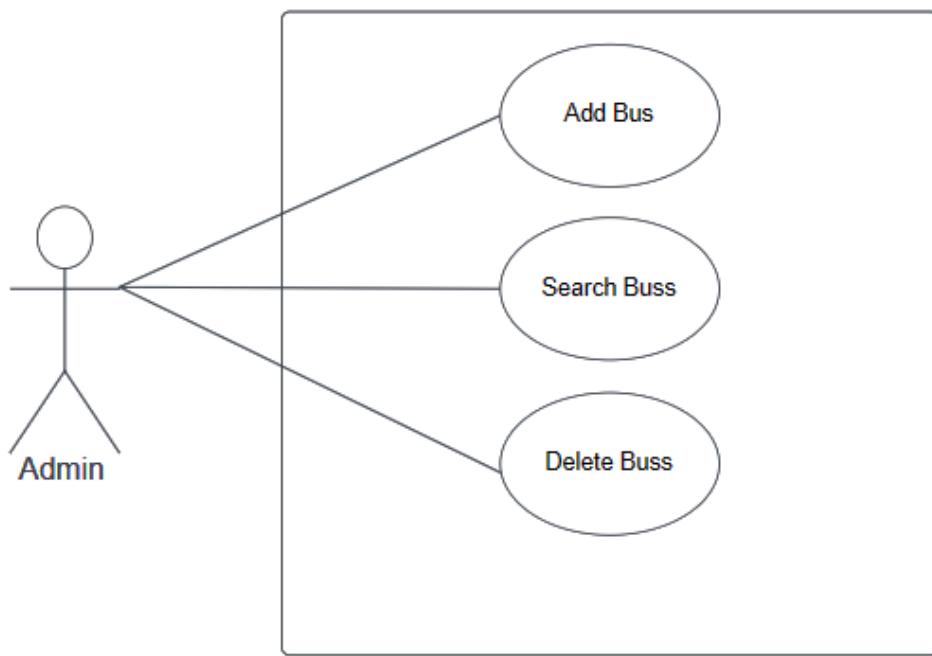


Figure 10: Use Case Diagram for Bus Management

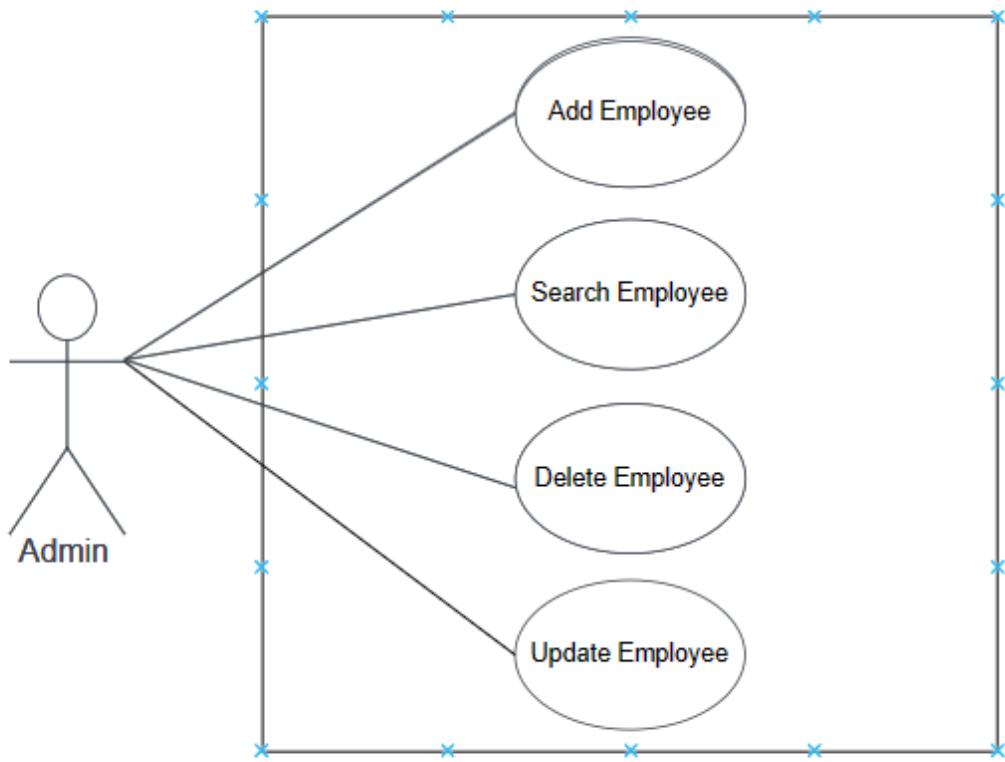


Figure 11: Use Case Diagram for Employee Management

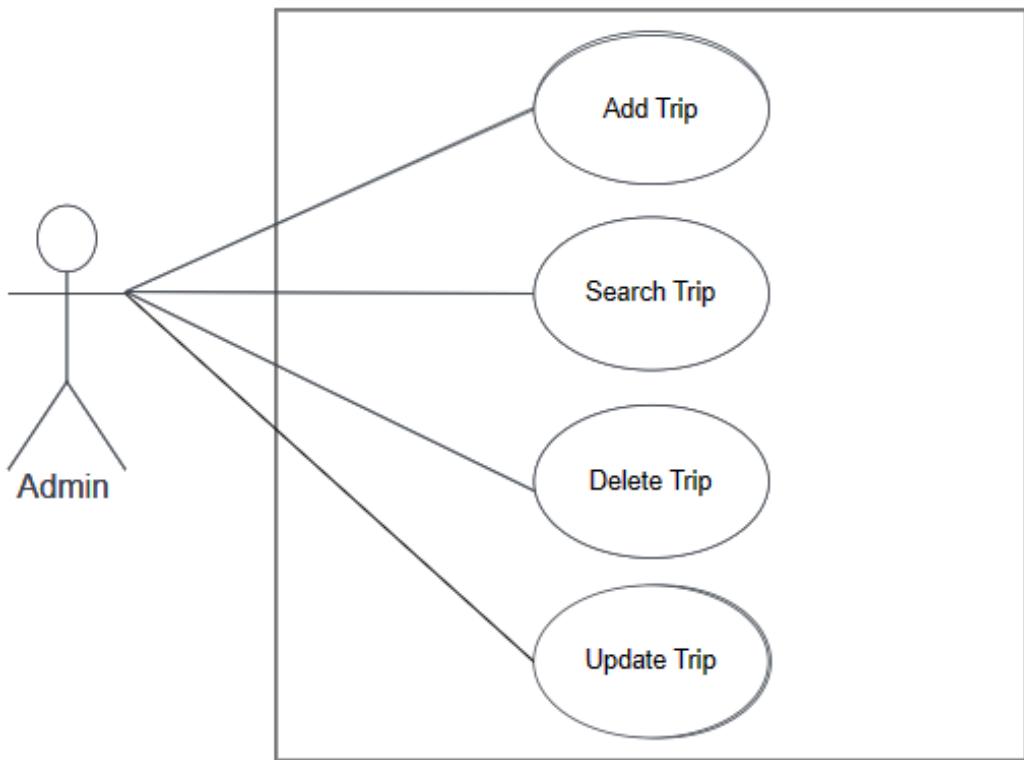


Figure 12: Use Case Diagram for Trip Management

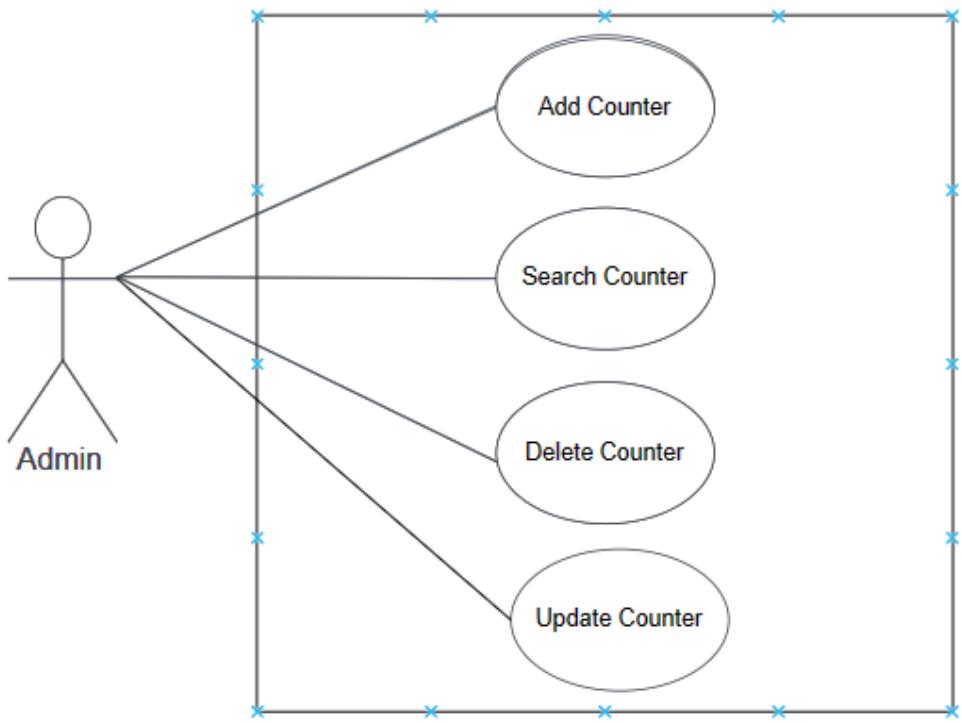


Figure 13: Use Case Diagram for counter Management

## 2.2 Process Models:

We used data flow diagramming technique, to model the processes and the flow of data through the system. The notation used are Gane And Sarson Symbols.

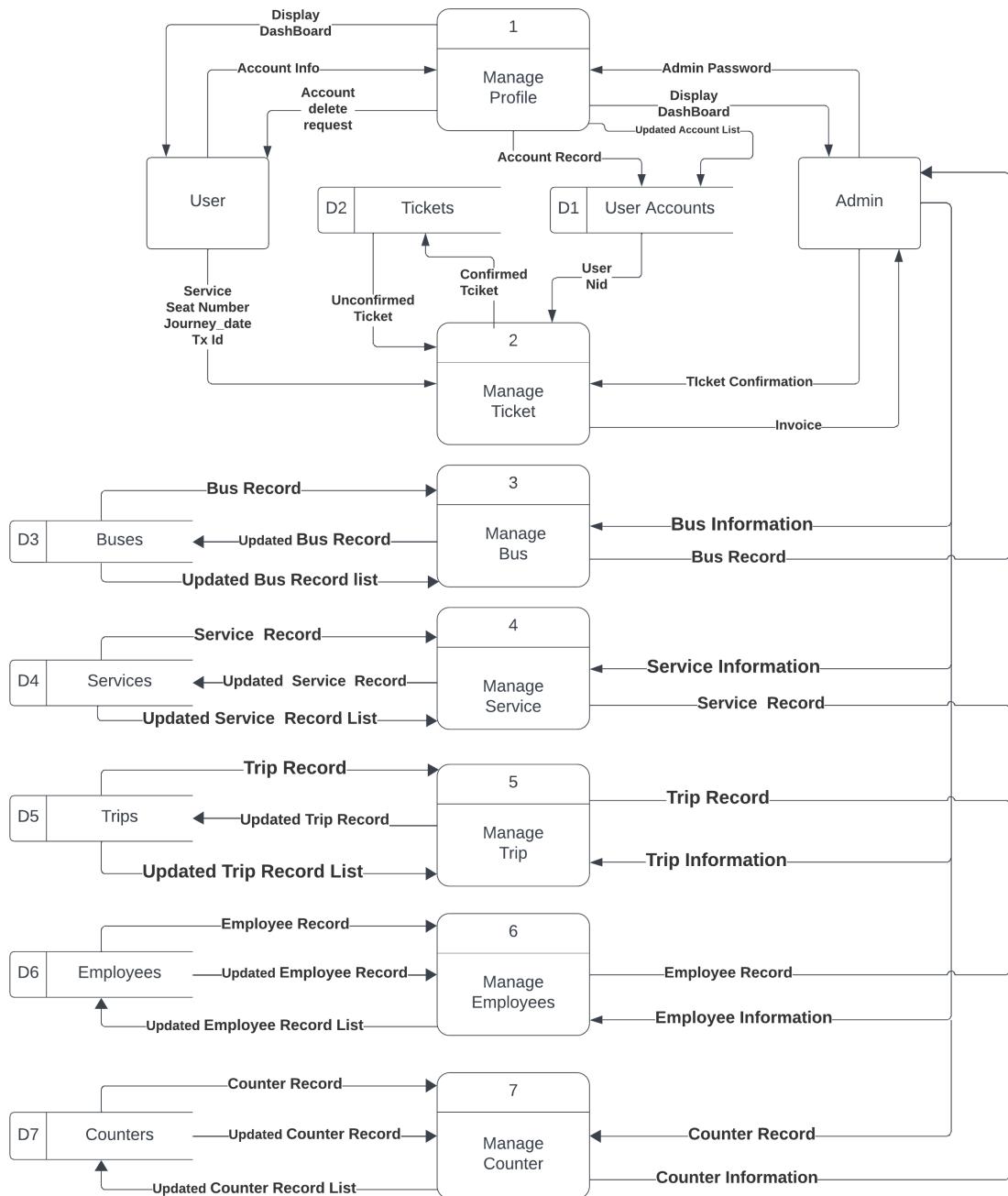


Figure 14: Level 1 DFD

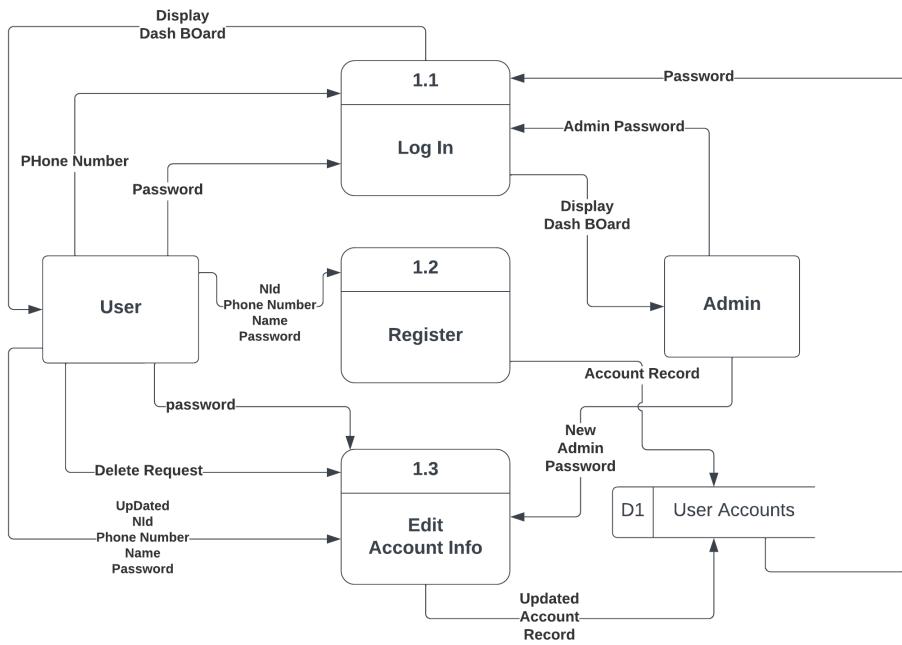


Figure 15: Level 2 DFD for profile management process

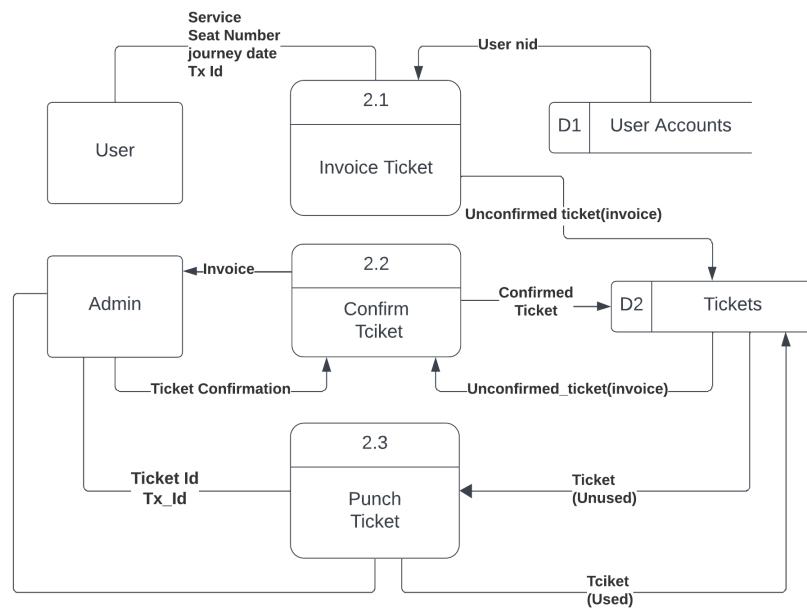


Figure 16: Level 2 DFD for Ticket management process

## 2.3 Data Modeling

We used Entity relationship diagramming to model the major data used in our system. The strong Entities could be identified by inspecting the data stores in the dfd, and the data elements that flow into and out of them.

The entities corresponding to the data stores D1 to D6 are :

1. USER
2. TICKET
3. BUS
4. SERVICE
5. TRIP
6. EMPLOYEE
7. COUNTER

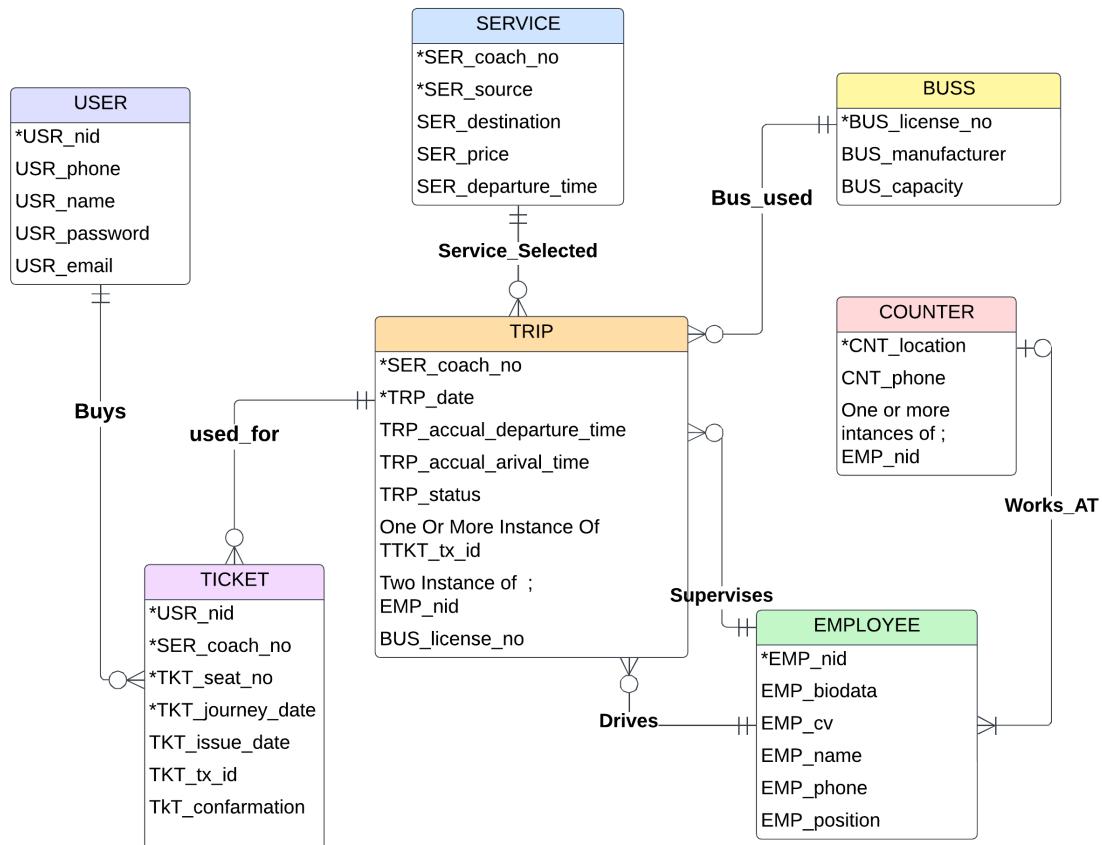


Figure 17: Logical Entity Relationship Diagram

### 3 SYSTEM DESIGN:

#### 3.1 Data Design

We validated the Logical ERD, by normalising the entities, and balancing it with the DFD. Then it was converted to a physical Data model, which is depicted by the Database diagram produced by XAMP working on mysql code. Notable changes are:

1. Multiple instances of employees working at a counter were normalized by creating an intersection entity: **COUNTER\_EMPLOYEE**.
2. Multiple instances of on-board passengers with tickets on a TRIP were resolved by adding a **used** field in the **TICKET** entity, to mark if the ticket instance was punched or not.

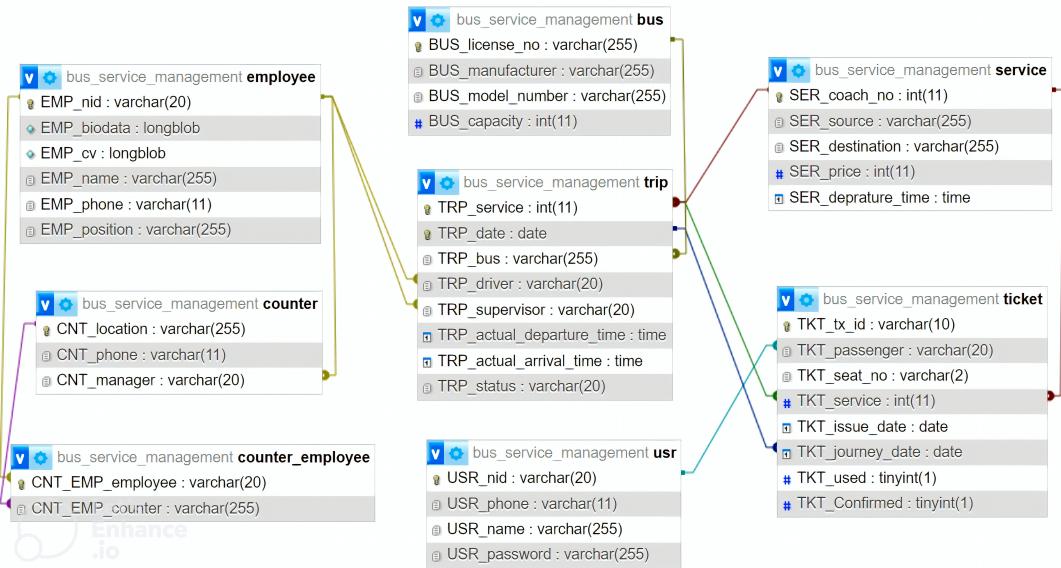


Figure 18: Database Diagram

### 3.2 UI Design

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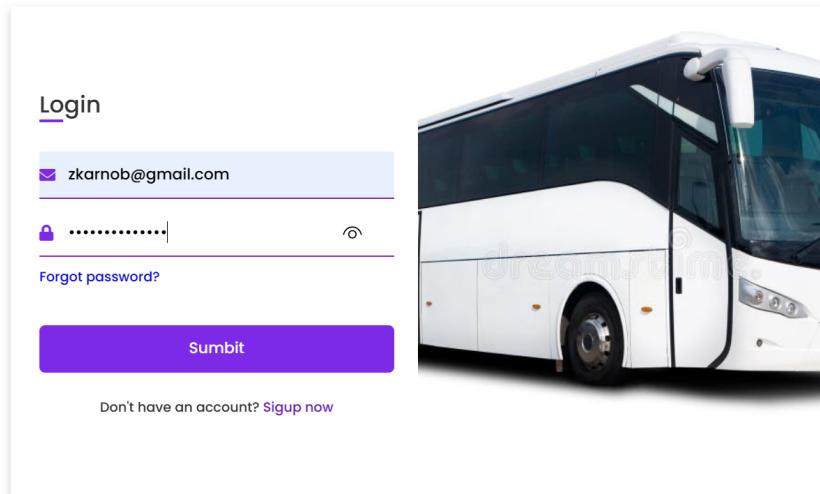


Figure 19: User Login Page

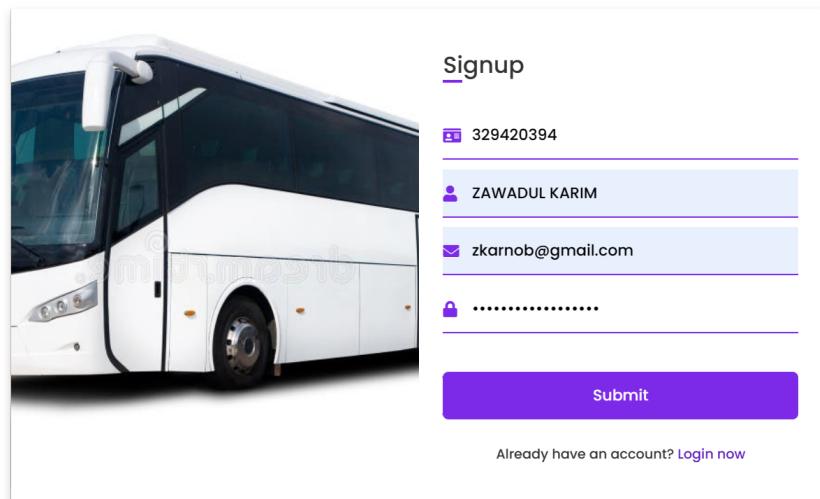


Figure 20: User Signup Page

Update Information

53453445644

ZAWADUL KARIM

zkarnob@gmail.com

.....

**Submit**

Figure 21: User Update Profile

*Bus Ticket System*

[Log Out](#)

**From**  
Enter City

**To**  
Enter City

**Date of Journey**      **Time**  
mm/dd/yyyy           

**Search**



Figure 22: Service Selection for Ticket Purchase

## Bus Ticket System

[Logout](#)

Starting Point : Sylhet  
Ending Point : Dhaka  
Journey Date : 10/12/2023

Departure Time : 10:00AM  
Arrival Time : 05:00PM  
Available : 32  
Fare : 600

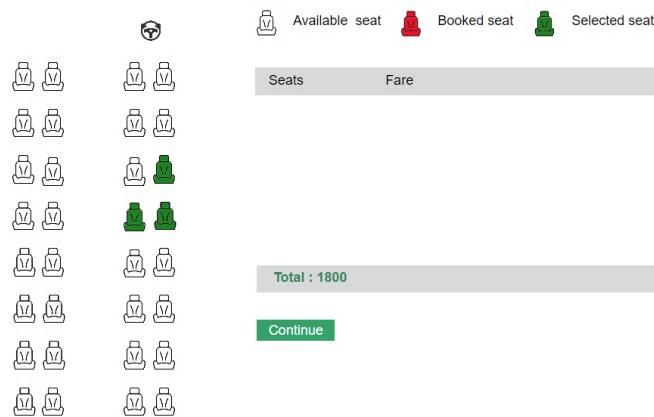


Figure 23: Seat Selection



Figure 24: Admin Dashboard

# Bus Ticket System



## Admin Dashboard

- [Bus](#)
- [Trips](#)
- [Counter](#)
- [Pending Tickets](#)
- [Ticket Puncher](#)
- [Employee](#)
- [Change Password](#)
- [Log Out](#)

Search Bus  Go Add New Bus

Bus Model	License No.	Manufacturer	Capacity	Action
1246	DHAKA-D-11-9999	Tata	40	<a href="#">Edit</a> <a href="#">Delete</a>
6477	ঢাকা মেট্রো-গ ১১-৯৯৯৯	Bajaj	40	<a href="#">Edit</a> <a href="#">Delete</a>

Figure 25: Bus Management Page

The screenshot shows the Admin Dashboard with the following interface elements:

- Header:** "Bus Ticket System" and a user icon.
- Search Bar:** "Search Employee" with a "Go" button.
- Table:** "Add New Employee" with columns: NID, Name, Position, Phone, Action. Data rows:
 

NID	Name	Position	Phone	Action
4212072678	Safayet Rafi	Driver	01999999999	Edit   Delete
2345123654	Sakibul Islam	Manager	01888888888	Edit   Delete
3456198234	Mahir Al Shahriar	Supervisor	01777777777	Edit   Delete
- Left Sidebar:** Navigation links including Bus, Trips, Counter, Pending Tickets, Ticket Puncher, Employee (highlighted in blue), Change Password, and Log Out.

Figure 26: Employee Management Page

The screenshot shows the Admin Dashboard with the following interface elements:

- Header:** "Bus Ticket System" and a user icon.
- Search Bar:** "Search Trips" with a "Go" button.
- Table:** "Add Trip" with columns: Source, Destination, Driver, Supervisor, Status, On-board Passengers, Date, Departure Time, Arrival Time, Action. Data rows:
 

Source	Destination	Driver	Supervisor	Status	On-board Passengers	Date	Departure Time	Arrival Time	Action
Sylhet	Dhaka	Sakibul Islam	Mahir Al Shahriar	Ongoing	25	25-11-2023	10:00	N/A	Edit   Delete
Sylhet	Chittagong	Safayet Rafi	Mahir Al Shahriar	Ongoing	30	27-11-2023	12:00	N/A	Edit   Delete
Chittagong	Dhaka	Sakibul Islam	Safayet Rafi	Completed	26	29-11-2023	10:00	15:00	Edit   Delete
- Left Sidebar:** Navigation links including Bus, Trips (highlighted in blue), Counter, Pending Tickets, Ticket Puncher, Employee, Change Password, and Log Out.

Figure 27: Trip Management Page

Pending Invoice					
#	Name	Email	TxID	Account	Status
1	Zawadul Karim	zknob@gmail.com	12319023192	800tk	✓ ✘
1	Mahir AL shahriar	mas@gmail.com	12319023192	800tk	✓ ✘
1	Rafi	rafib@gmail.com	12319023192	800tk	✓ ✘

Showing 3 out of 3 entries

Previous

Figure 28: Page for Confirming Ticket Invoices

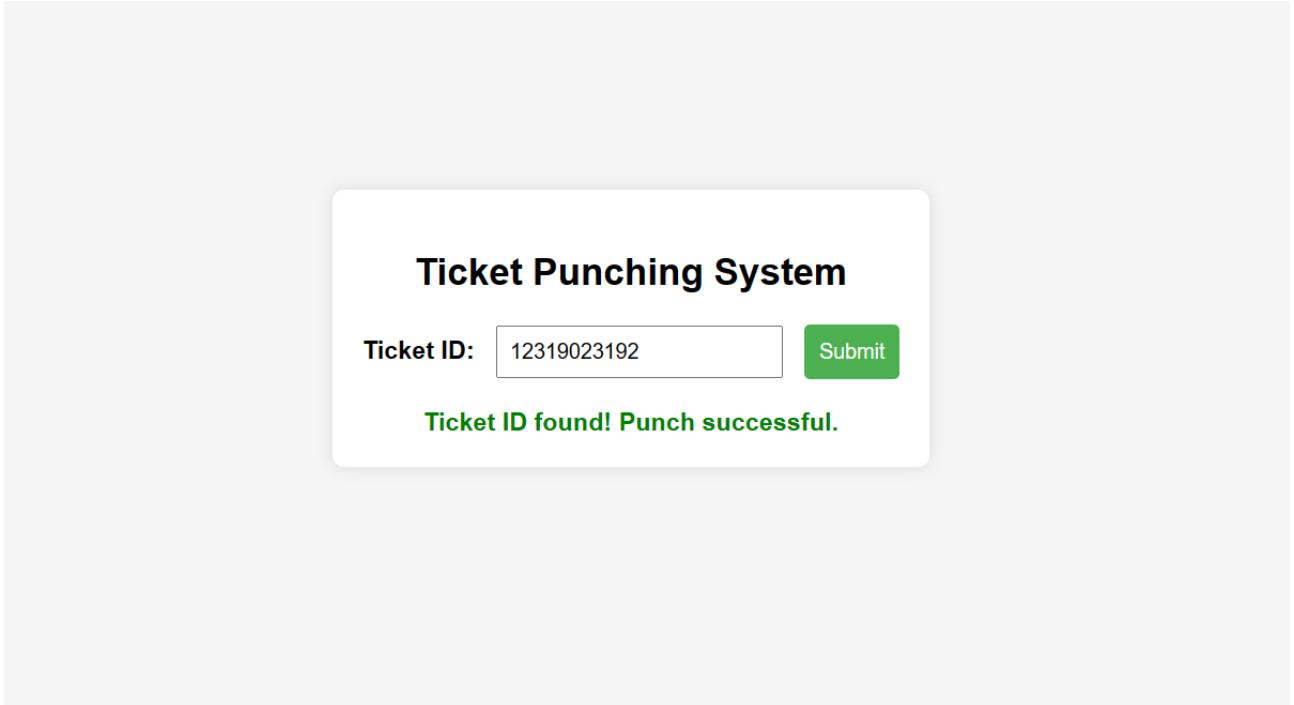


Figure 29: Ticket Punching Page

## **4 Implementation**

Our Project was implemented using some technologies and languages. The Languages are the following

1. JavaScript
  2. HTML
  3. CSS
  4. MySQL
5. Technologies used while creating the project:
- (a) NodeJs
  - (b) Express
  - (c) ReactJs
  - (d) JSON Web Token

The actual code implementation of our project is on Github to track our work progress.

## **5 Testing**

We did unit test on the modules that were implemented. The tests included if our backend routes were sending requests and receiving them correctly while it also helped us to sync with our database correctly. The tool used for testing our routes and request response correctly is "Postman". Though we are yet to do testing with live users on the project that would be done when the whole system comes together and it is ready for the system testing phase

## **6 Training and Maintenance**

This portion contains our nonfunctional requirements and security assurance steps

### **6.1 Non-Functional Requirements**

A nonfunctional requirement is an attribute that dictates how a system operates. It makes applications or software run more efficiently and illustrates the system's quality. We tried our best to ensure some of the most important non-functional requirements like security, performance, reliability, data integrity and easier navigation for our users. Some of the non-functional requirements we want to highlight are listed below:

1. The User Interface was made easier to navigate from one page to another, and the steps to complete tasks are simple for a smooth user experience.
2. The load time for the website was kept at a minimum.
3. User account safety was ensured using strong password systems and hash functions while storing.
4. User information change can be done only when the user is authenticated through the use of JSON Web Token.
5. The contest creation and participation were also made secure with the use of passwords.

6. The system is easily accessible throughout the time our system is up and running without delay.
7. The data was handled carefully to ensure data integrity, and the data accuracy remains at its peak.