A PROJECT REPORT ON

E-TICKETING SYSTEM FOR PUBLIC TRANSPORT

SUBMITTED TO THE SAVITRIBAI PHULE PUNE UNIVERSITY, PUNE IN THE PARTIAL FULFILLMENT FOR THE AWARD OF THE DEGREE

OF

BACHELOR OF ENGINEERING

IN

INFORMATION TECHNOLOGY

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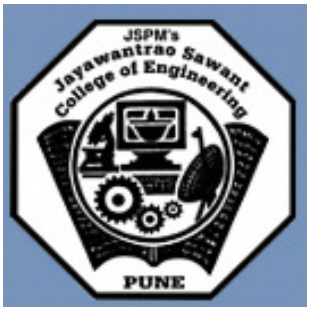
DEPARTMENT OF INFORMATION TECHNOLOGY

JAYAWANTRAO SAWANT COLLEGE OF ENGINEERING

2018-19



INFORMATION TECHNOLOGY

Certificate

This is to certify that,

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is a bonafide work carried out by them under the supervision of Prof.Suruchi Nannaware and it is approved for the partial fulfillmment of the requirement of Savitribai Phule Pune University for the award of the Degree of Bacholer of Engineering (Information Technology)

This project report has not been earlier submitted to any other institute or University for the award of degree or diploma.

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Abstract

The technology of today is more advanced than compare to any previous time. One of the blessings of technology is web application. It allows users to interact with the system from anywhere as long as they are connected to the internet. In existing system we see , if any customer need to reserve seat he or she need to call them or walk towards them which is consider as wasting their valuable times. So that, we are building this system in which user can book bus seat in advance by paying money from e-wallet, means user just have to scan the QR code from bus conductor .It also eliminate the payment issue (cash or issue of change).It is the planning to replace our old booking system with new system which is online based. So we want to implement an online web based bus ticketing system which will be easier for customers to book from home and abroad as well as for them to manage their overall business smoothly. Here the system we are going to discuss is E-Ticketing System for public bus transport" which is completely a web application. As we already discussed above that internet has made the users interaction through the system easier, so this web application can connect to respective servers for accessing data which will surely help users to purchase the bus ticket or reserve their seats online without waiting on queue.

Keywords
E-Ticket, Android, QR code, Web Application, Bus Ticket.

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Abbreviations

1. IT - Information Technology
2. AES - Advance Encryption Standard
3. DES - Data Encryption Standard
4. GPS - Geo Position System
5. GSM - Global System for Mobile
6. SMS - Short Message Service
7. RFID - Radio Frequency Identification
8. SDLC - System Development Life Cycle
9. SDK - Software Development Kit
10. KNN Algorithm - K-Nearest Neighbors Algorithm
11. DFD - Data Flow Diagram
12. ER - Entity Relationship

Chapter 1
Introduction

1.1 Introduction of the system

In this system, we allows users to interact with the system from anywhere as long as they are connected to the internet. In existing system we see , if any customer need to reserve seat he or she need to call them or walk towards them which is consider as wasting their valuable times. So that, we are building this system in which user can book bus seat in advance by paying money from e-wallet , means user just have to scan the QR code from bus conductor .It also eliminate the payment issue (cash or issue of change).It is the planning to replace our old booking system with new system which is online based. So they want to implement an online web based bus ticketing system which will be easier for customers to book from home and abroad as well as for them to manage their overall business smoothly. Here the system we are going to discuss is "Online Bus Ticketing System" which is completely a web application. As we already discussed above that internet has made the users interaction through the system easier, so this web application can connect to respective servers for accessing data which will surely help users to purchase the bus ticket or reserve their seats online without waiting on queue. Moreover, in recent decays peoples are like to travel to get some relief from their monotonous life. So, they want to travel without any hesitations. In this modern tech era they want a system that will enhance the portability, accessibility as well as user friendly. So here, we are going to implement a web system, which we already stated above, having all the features that will make it more user friendly and accessible.

1.2 Motivation

To help the customer as they can inquire about the Bus model, its Ticket price, available Seats, facility of the bus etc. and they dont need to walk towards the bus enquiry office.In this system user books ticket online in advance, user get a QR code which include user information ,bus conductor will scan QR code and a travelling amount will be automatically deduct from e-wallet .

1.2.1 Aim

The main aim of this system is to provide a convenient and hassle free ticket booking system for public bus transport which will save time of the passenger.

1.2.2 Objectives and Scope

1.2.2.1 Objectives

- To provide online booking system for public bus transport.
- To help passenger track bus and save time.
- To save data of passengers and bus activities for data analysis purpose.

1.2.2.2 Scope

- It is easy to book tickets online and available 24 X 7.
- It helps to analyze data for smooth functioning of public transport.
- It can be used for Railway ticket booking as well as for booking movie ticket.

1.3 Organization of Report

The report is organized as follows. Chapter 1 is Introduction to Project is covered. Introduction contains information about domain, topic and title. It also includes Motivation, Aim and Objectives of seminar. Chapter 2 is Literature Survey and their advantages and disadvantages. Chapter 3 is system overview. Chapter 4 is Advantages, Disadvantage and Applications. Chapter 5 is Conclusion of Project.

Chapter 2
Literature Survey

2.1 GPS Supported City Bus Tracking Smart Ticketing System

2.1.1 Description

GPS is more popular technology which is used in many applications. This existing system gives information about vehicle position and route travelled by vehicle and this information can be monitor from any remote place or location. This system depends on GPS and GSM technology. This system lags in some features like its track vehicle only on PC not on mobile. And also there is no application depending on mobile device to track and get a real time and current view of target or vehicle.[2]

2.1.2 Advantages

1. Easy to use, wide area range, easy to implement in vehicles, more effective, huge capacity .
2. People can access this information from their android mobile phones.
3. Smart card based ticketing is also a very convenient option for traveling in bus.
4. With the help of this facility, people can do moneyless traveling, which is secure one

2.1.3 Disadvantages

1. Expensive to introduce.
2. Risks of fake smart cards-ticket still exist.
3. Loss of Card may happen.

2.2 Electronic Ticket Machine Data Analytics for Public Bus Transport Planning

2.2.1 Description

This paper investigates various aspects related to demand modeling and line-planning for bus transport systems based on data elicited from Electronic Ticket Machine (ETM). The ETM data has not been explored thoroughly for transportation planning although it is nowadays collected and compiled by public transport undertakings on a regular basis. The data used in the study is part of transactions on ticket sales by Kerala State Road Transport Corporation (KSRTC) maintained at 6 bus depots in Trivandrum city for the period between 2010 and 2013. [3]

2.2.2 Advantages

1. The archived ETM data can give insights to the traffic network providing quantitative measures of operational performance.

2. It helps in the traffic demand estimation and distribution.

2.2.3 Disadvantages

1. Expensive to Introduce.

2. Lots of specific technical requirements both passenger and transport operators.

3. System should be well organized and maintained.

2.3 RFID and Android Based Smart Ticketing and Destination Announcement System (2016)

2.3.1 Description

In this paper, they have implemented an automated process for ticketing system in the Public Transport, which is mainly based on RFID and GPS technology. A user-friendly app SwipeNgo has been developed on Android Operating System (OS) to make the whole journey of a passenger enjoyable and hassle-free. This system eliminates the usage of paper-tickets. In the present ticketing system, the conductors manually issue tickets and the fare is calculated mentally before issuing the tickets. The details of the destination bus stop and source bus stop are not mentioned on the tickets. Moreover, after the passenger reaches the destination, the ticket is of no use, and is thrown away.

2.3.2 Advantages

1. Passenger can take a cashless ride.
2. smart cards are reusable over a particular time period, for a month or a year.

2.3.3 Disadvantages

1. Sometimes not as accurate or reliable as barcode scanners
2. Cost RFID readers can be 10x more expensive than barcode scanners.
3. Implementation can be difficult time consuming.

2.4 Comparison Table

IEEE Papers	Technology Used	Description	Drawbacks
GPS Supported City Bus Tracking & Smart Ticketing System (2015)	GPS & Smart Card	Gives information about vehicle position and route travelled by vehicle and includes the integrated use of smart cards with GPS system.	Expensive to introduce. Risks of fake smart cards-ticket still exist.
RFID and Android Based Smart Ticketing and Destination Announcement System (2016)	RFID tag & GPS	Combines RFID and GPS technology to design an automatic bus-ticketing system	Sometimes not as accurate or reliable as barcode scanners. Implementation can be difficult & time consuming.
Electronic Ticket Machine Data Analytics for Public Bus Transport Planning (2017)	ETM	Line-planning for bus transport systems based on data elicited from Electronic Ticket Machine (ETM).	Expensive to Introduce. Lots of specific technical requirements both passenger and transport operators.

Figure 2.1: Literature Survey

Chapter 3
Project Statement and Requirements

3.1 Problem Statement

"To design and implement a secure E ticketing system for public bus transport to provide hassle free travel to daily users ."
People daily travel for work, school, colleges using public bus transport services as it is the cheapest service available at any time. There are number of problems people face while travelling like issue of exact change amount of ticket, no seats available, crowded buses, delay in bus, loss of ticket etc.
With the help of increasing technology and use of mobile phones we can overcome the above stated problems. We will be developing a mobile application as it would be more convenient if we allow people to track buses and book ticket in advance using their mobile phone.

3.2 Requirements

3.2.1 Hardware

(a) Processor - Intel i3 and above
(b) Speed - 1.1 GHz and above
(c) RAM - 8 GB(Minimum)
(d) Hard Disk - 20 GB

3.2.2 Software

(a) Operating System - Windows 7/8/10
(b) Software Tools - Android Studio, XAMPP, Eclipse IDE
(c) Programming Language - JAVA
(d) Browser - Chrome/ Mozilla Firefox

Chapter 4
System Architecture and Design

4.1 System Overview

In this, we allow users to interact with the system from anywhere as long as they are connected to the internet. In existing system we see , if any customer need to reserve seat he or she need to call them or walk towards them which is consider as wasting their valuable times. So that, we are building this system in which user can book bus seat in advance by paying money from e-wallet , means user just have to scan the QR code from bus conductor .It also eliminate the payment issue (cash or issue of change).It is the planning to replace our old booking system with new system which is online based. So we want to implement an online web based bus ticketing system which will be easier for customers to book from home and abroad as well as for them to manage their overall business smoothly. As we already discussed above that internet has made the users interaction through the system easier, so this web application can connect to respective servers for accessing data which will surely help users to purchase the bus ticket or reserve their seats online without waiting on queue. Moreover, in recent decays peoples are like to travel to get some relief from their monotonous life. So, they want to travel without any hesitations. In this modern tech era they want a system that will enhance the portability, accessibility as well as user friendly. So here, we are going to implement a web system, which we already stated above, having all the features that will make it more user friendly and accessible.

4.2 Diagrams

4.2.1 Use Case Diagram

A use case diagram is a graphical representation of a users interaction with the system and depicting the specifications of a use case. A use case diagram can show the different types of users of a system and the various ways in which they interact with the system. Use case diagrams are used to gather the requirements of a system including internal and external influences. These requirements are mostly design requirements. So when a system is analyzed to gather its functionality use cases are prepared and actors are identified. The purposes of use case diagrams can be as follows:

1. Used to gather requirements of a system.
2. Used to get an outside view of a system.

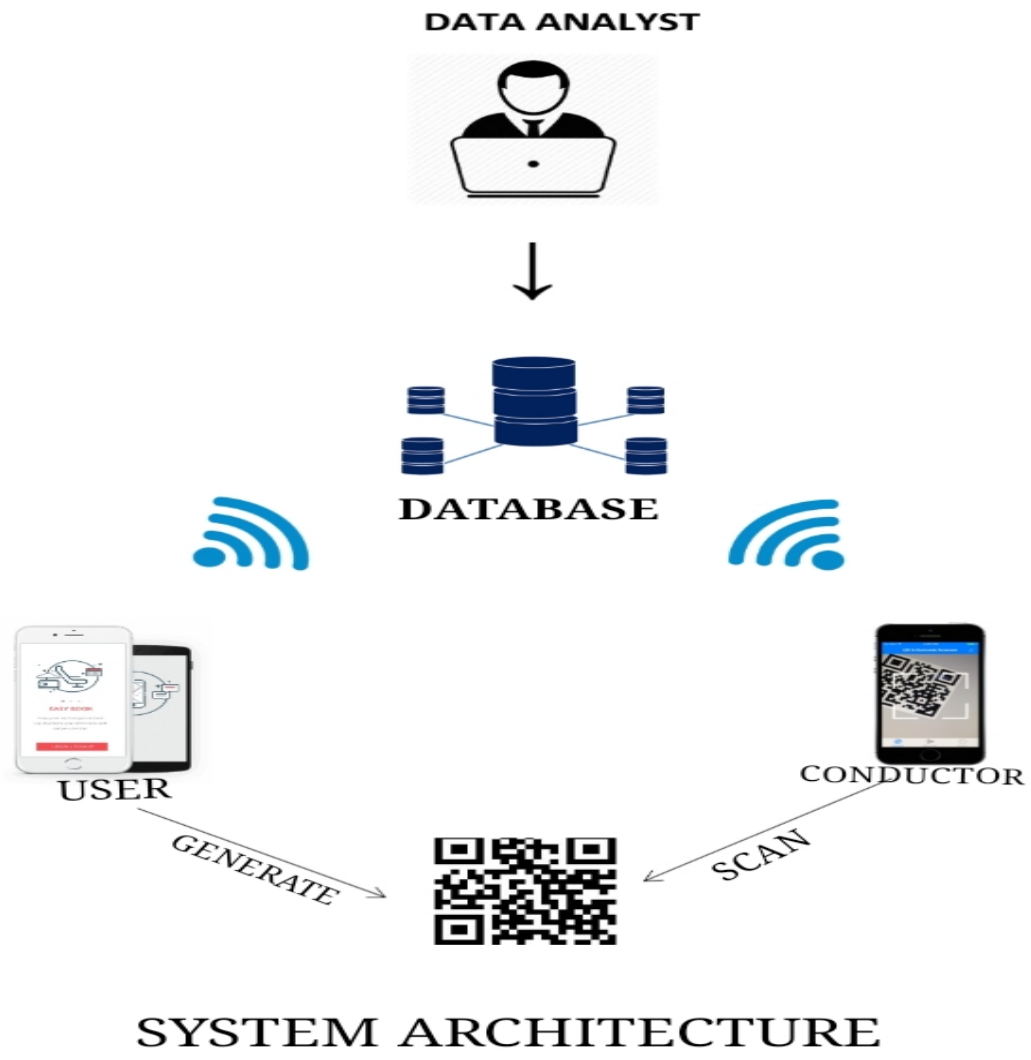

Figure 4.1: System Architecture

3. Identify external and internal factors influencing the system.
4. Show the interaction among the actors.

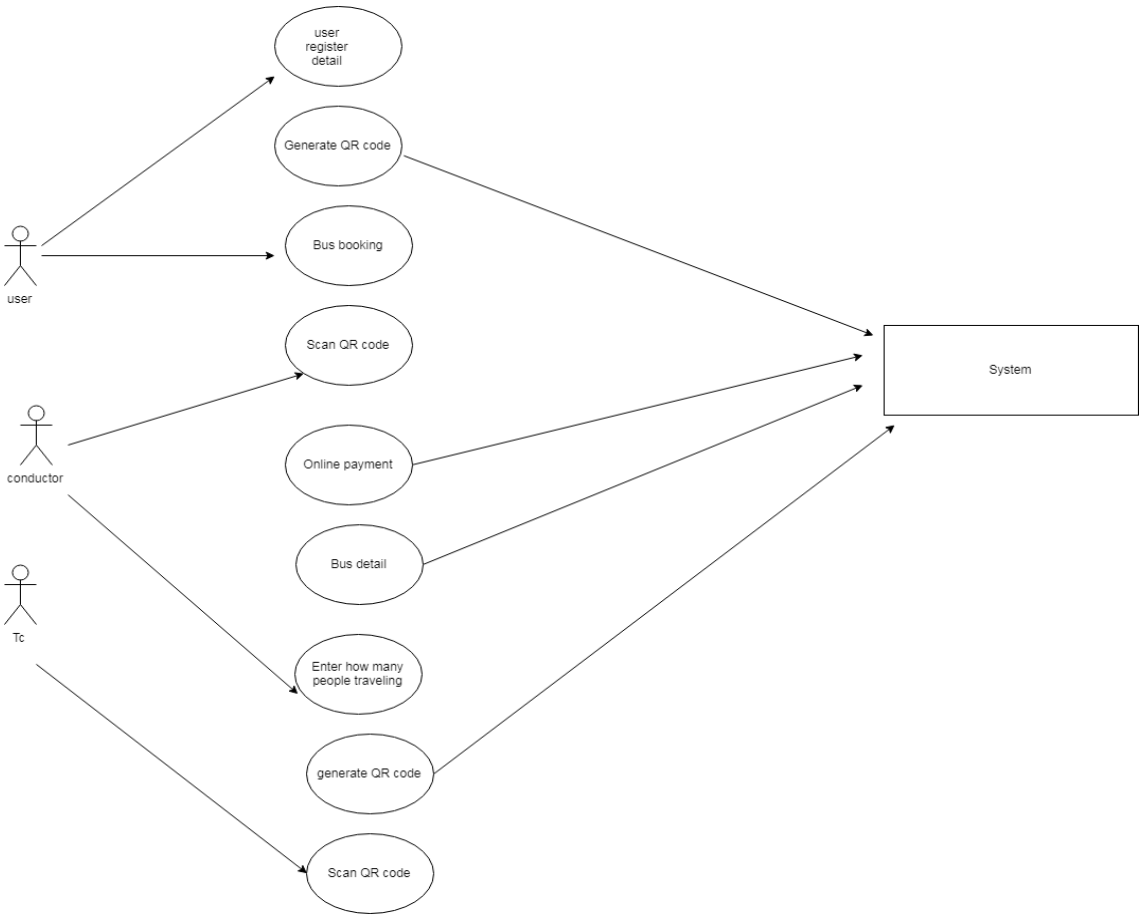

Figure 4.2: Usecase Diagram

4.2.2 Activity Diagram

Activity diagrams are graphical representations of work ows of step- wise activities and actions with support for choice, iteration and con- currency. In theUnified Modeling Language, activity diagrams are intended to model both computational and organizational processes (i.e. workflows). Activity diagrams show the overall flow of control. Activity diagrams are constructed from a limited number of shapes, connected with arrows. The most important shape types:

1. Rounded rectangles represent actions;
2. Diamonds represent decisions;
3. Bars represent the start (split) or end (join) of concurrent activities;
4. A black circle represents the start (initial state) of the work ow;
5. An encircled black circle represents the end (final state)

Arrows run from the start towards the end and represent the order in which activities happen. Hence they can be regarded as a form of flowchart. Typical flowchart techniques lack constructs for ex-pressing concurrency. However, the join and split symbols in activity diagrams only resolve this for simple cases; the meaning of the model is not clear when they are arbitrarily combined with decisions or loops.

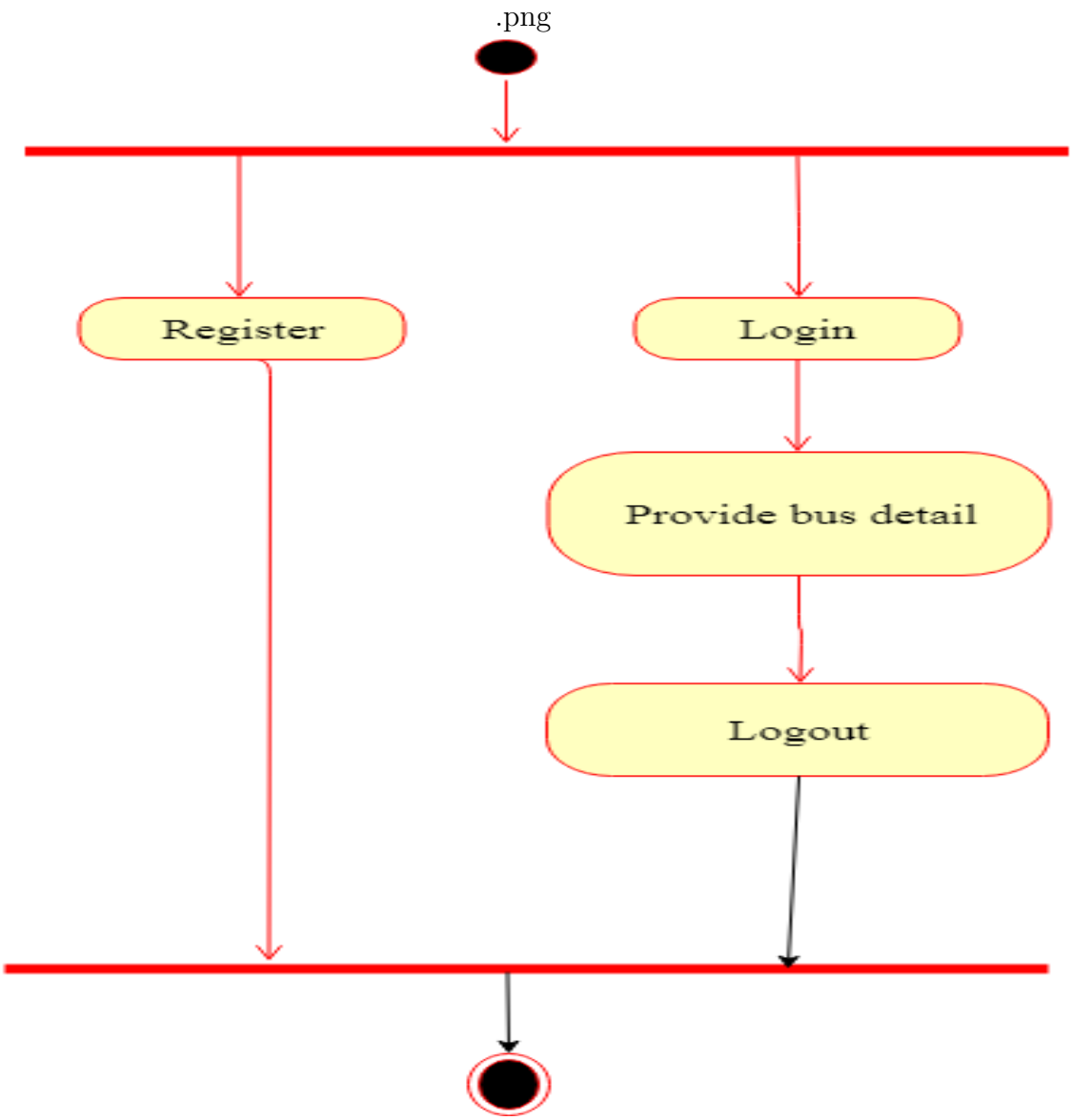

Figure 4.3: Sequence Diagram

4.2.3 Class Diagram

The class diagram is a static diagram. It represents the static view of an application. Class diagram is not only used for visualizing, describing and documenting difierent aspects of a system but also for constructing executable code of the software application. The class diagram describes the attributes and operations of a class and also the constraints imposed on the system. The class dia- grams are widely used in the modeling of object oriented systems because they are the only UML diagrams which can be mapped directly with object oriented languages. The class diagram shows a collection of classes, interfaces, associations, collaborations and constraints. It is also known as a structural diagram. The purpose of the class diagram is to model the static view of an application.

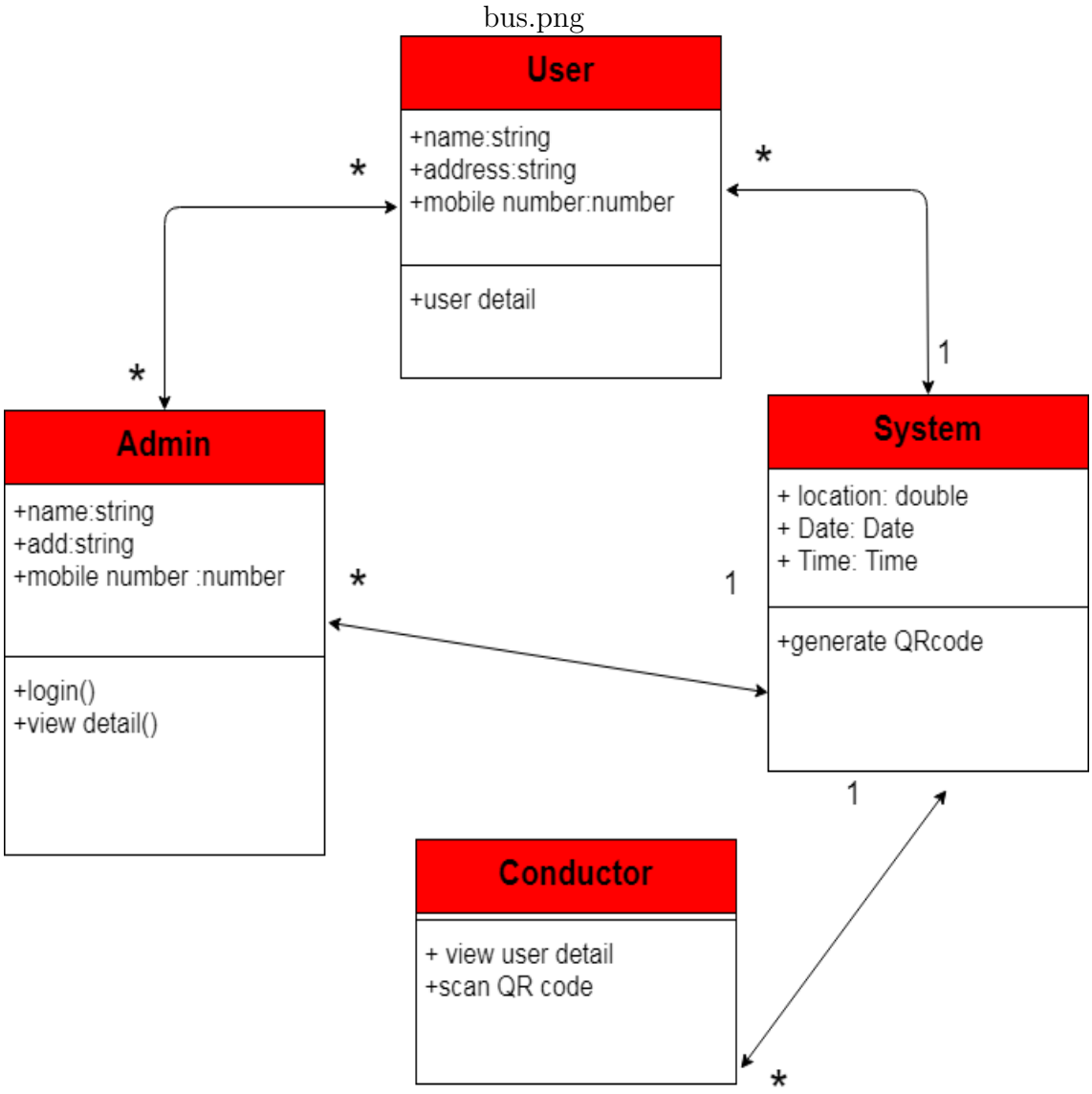

Figure 4.4: Sequence Diagram

4.2.4 Sequence Diagram

A Sequence diagram is an interaction diagram that shows how processes operate with one another and in what order. It is a construct of a Message Sequence Chart. A sequence diagram shows object interactions arranged in time sequence. It depicts the objects and classes involved in the scenario and the sequence of messages exchanged between the objects needed to carry out the functionality of the scenario. Sequence diagrams are typically associated with use case realizations in the Logical View of the system under development. Sequence diagrams are sometimes called event diagrams or event scenarios.

sequence.png

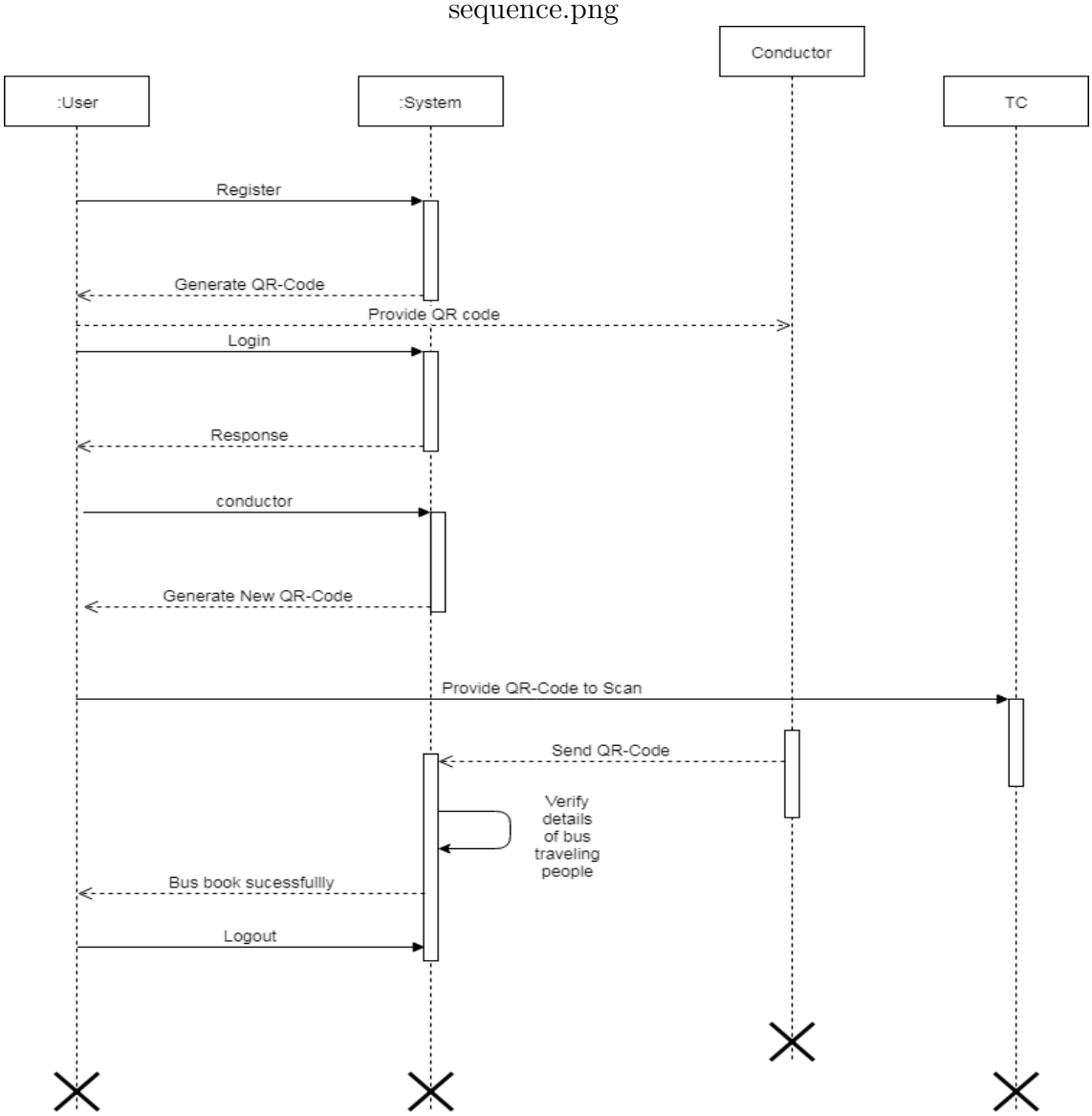

Figure 4.5: Sequence Diagram

4.2.5 Component Diagram

A Component Diagram displays the structural relationship of components of a software system. These are mostly used when working with complex systems that have many components. Components communicate with each other using interfaces. The interfaces are linked using connectors.

COMP (1).png

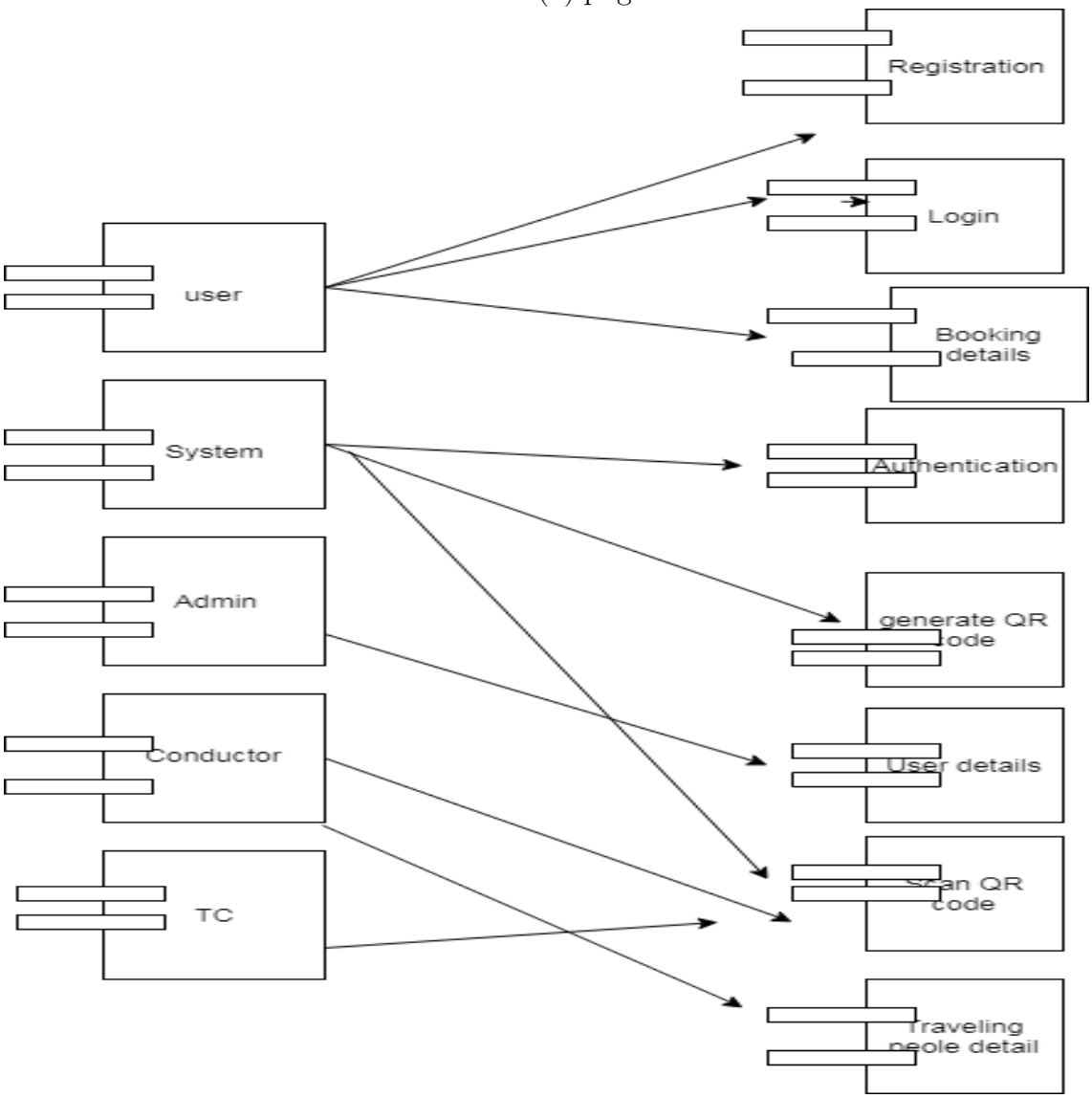

Figure 4.6: Component Diagram

4.2.6 Deployment Diagram

Deployment diagrams are used to visualize the topology eof the physical components of a system where the software components are deployed. So deployment diagrams are used to describe the static deployment view of a system. Deployment diagrams consist of nodes and their relationships.

DEPLOY.png

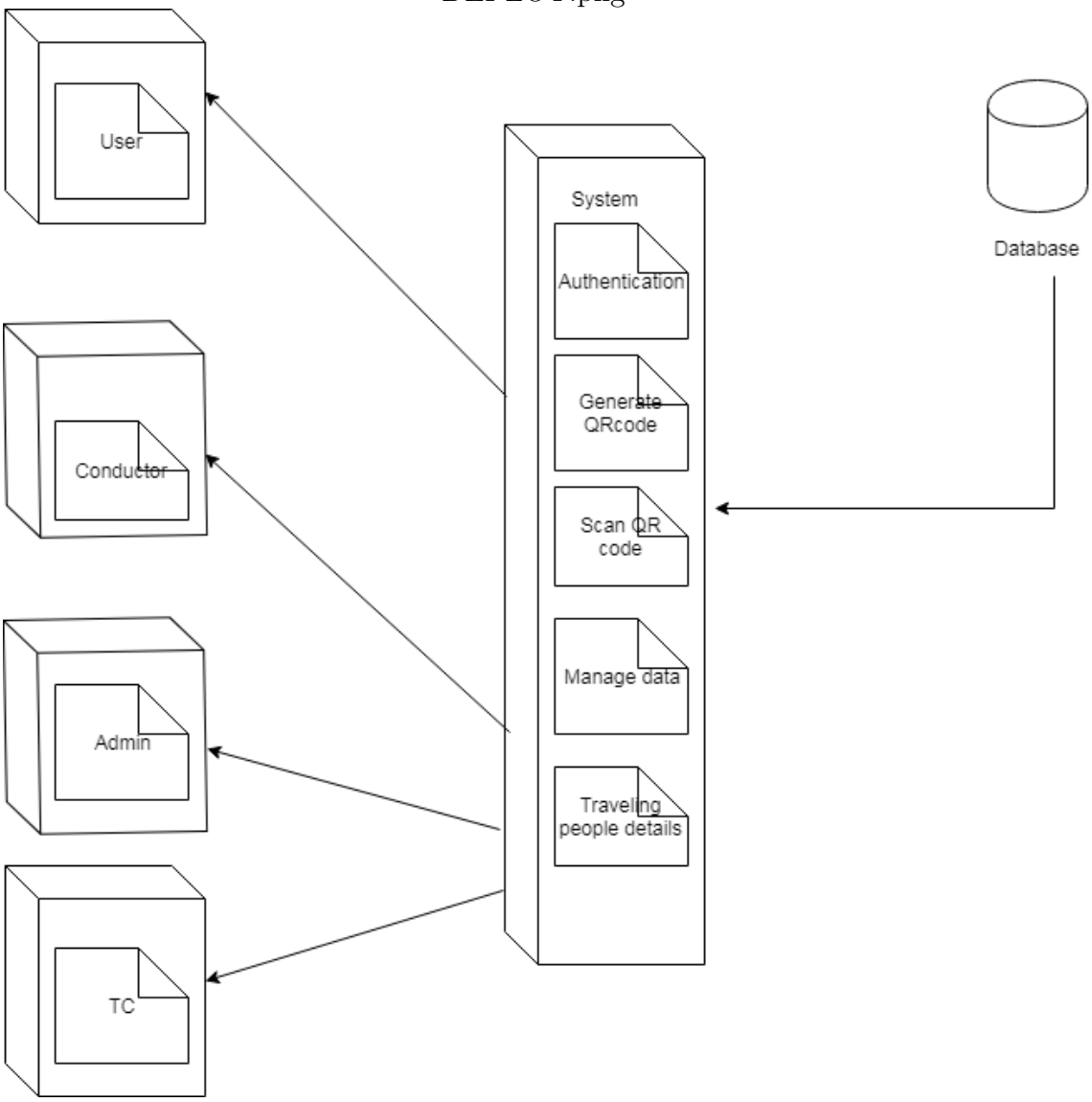

Figure 4.7: Deployment Diagram

4.3 DFD

A data ow diagram (DFD) is a graphical representation of the flow of data through an information system, modeling its process aspects. A DFD is often used as a preliminary step to create an overview of the system without going into great detail, which can later be elaborated. DFDs can also be used for the visualization of data processing (structured design). A DFD shows what kind of information will be input to and output from the system, how the data will advance through the system, and where the data will be stored. It does not show information about process timing or whether processes will operate in sequence or in parallel, unlike a traditional structured flowchart which focuses on control flow, or a UML activity work flow diagram, which presents both control and data, flows as a unified model.

4.3.1 DFD Level 0

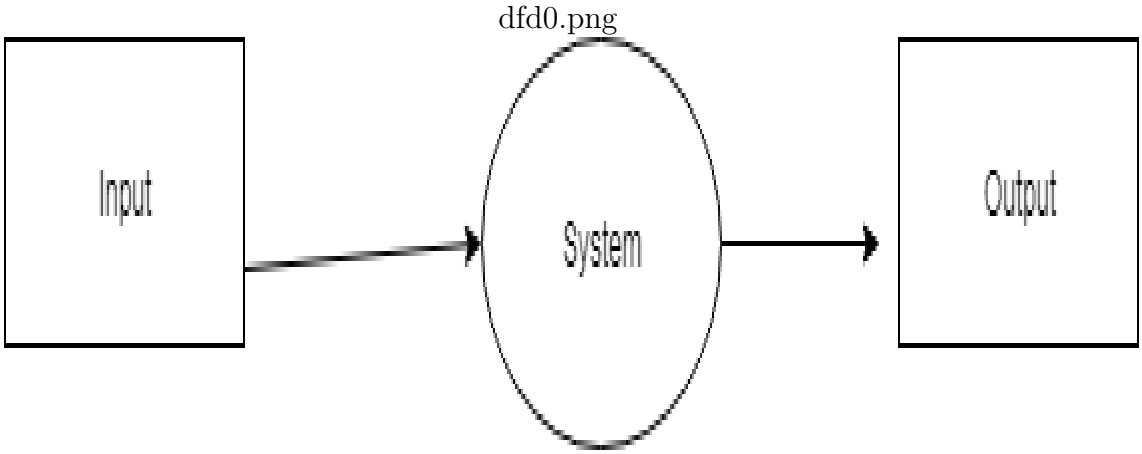

Figure 4.8: DFD Level 0

4.3.2 DFD Level 1

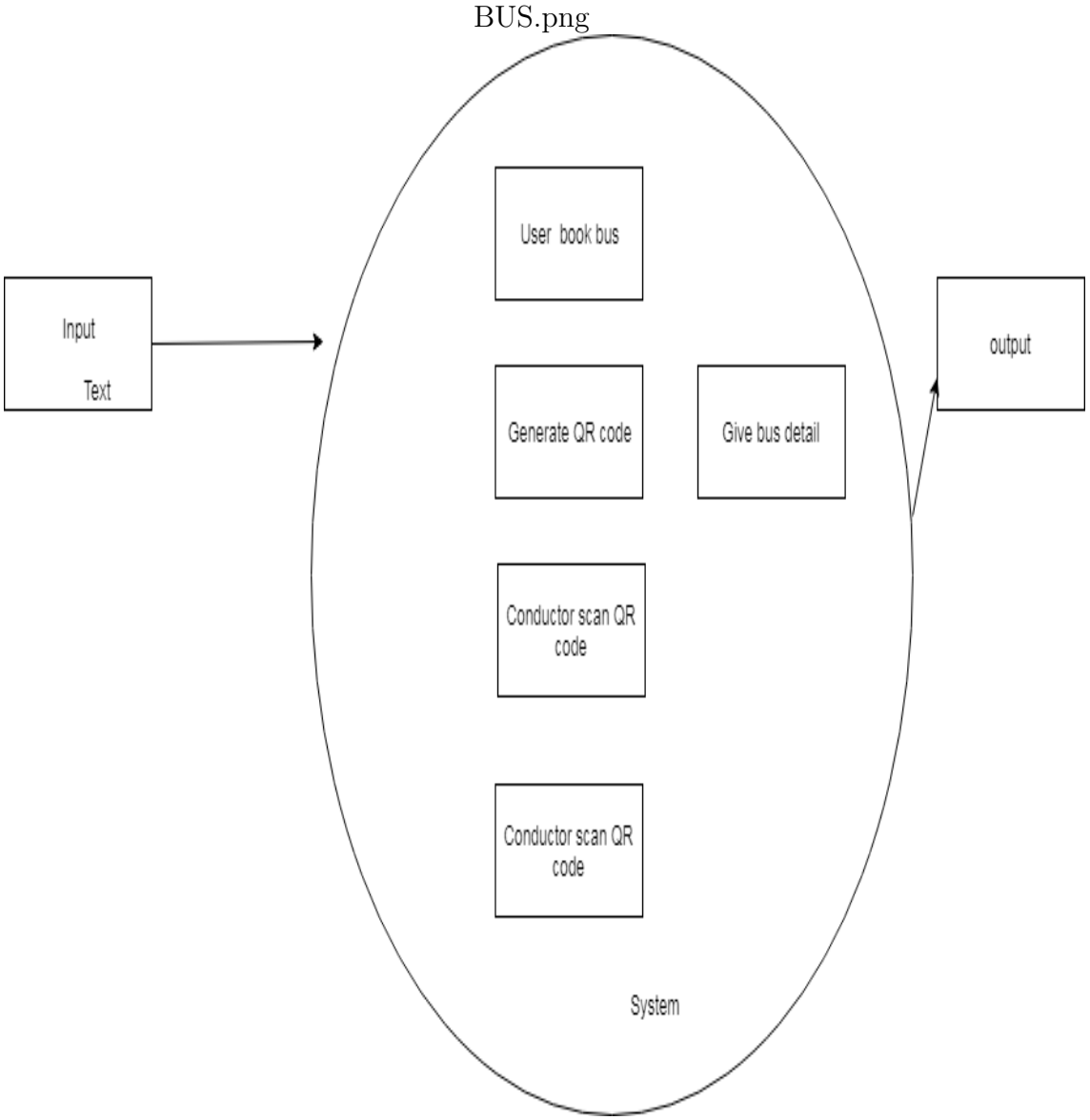

Figure 4.9: DFD Level 1

4.3.3 DFD Level 2

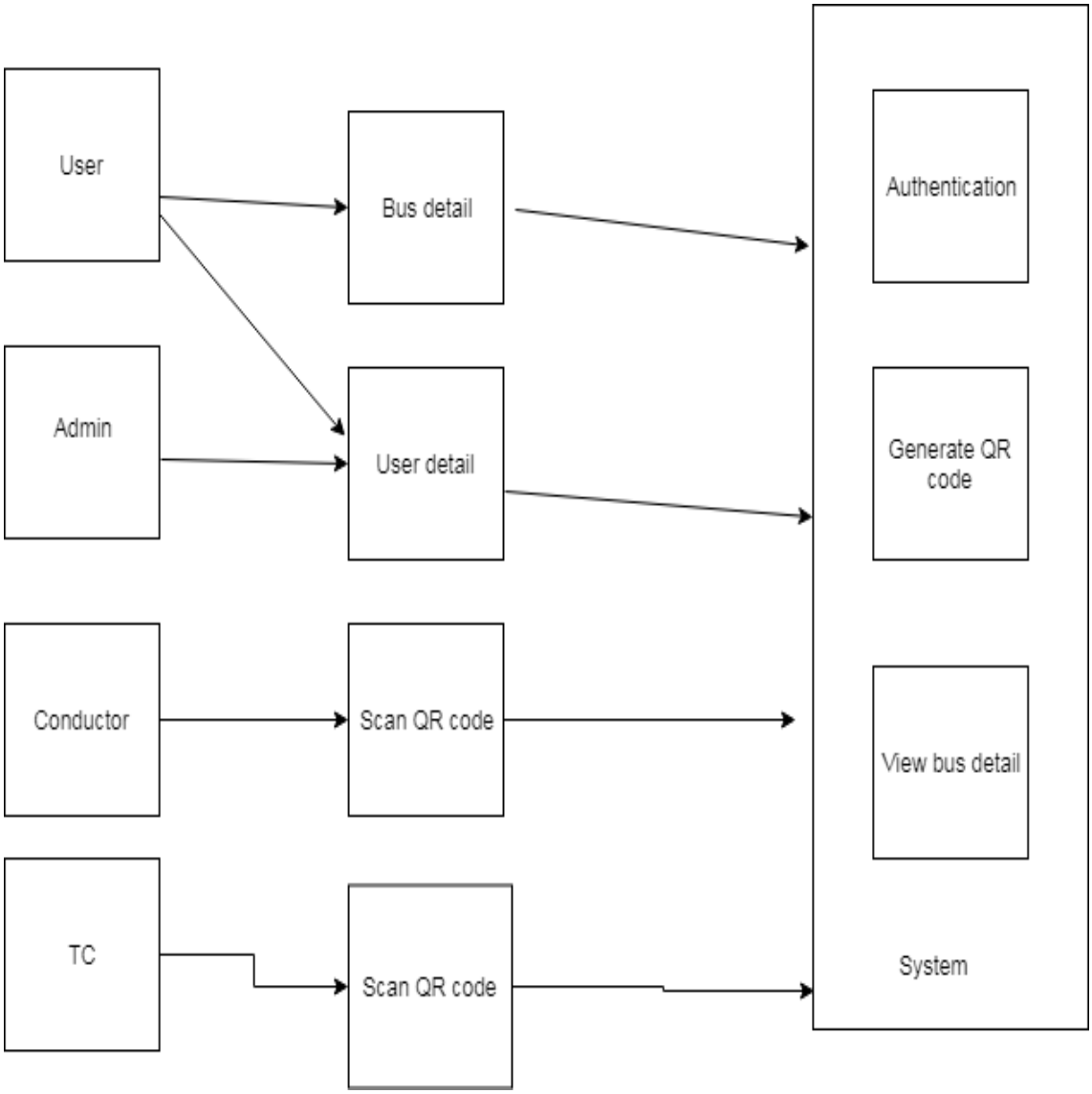

Figure 4.10: DFD Level 2

4.4 ER Diagram

An entity-relationship model (ER model for short) describes interrelated things of interest in a specific domain of knowledge. A basic ER model is composed of entity types (which classify the things of interest) and specifies relationships that can exist be- tween instances of those entity types. In software engineering, an ER model is commonly formed to represent things that a business needs to remember in order to perform business processes. Con- sequently, the ER model becomes an abstract data model, that defines a data or information structure which can be implemented in a database, typically a relational database

bus.png

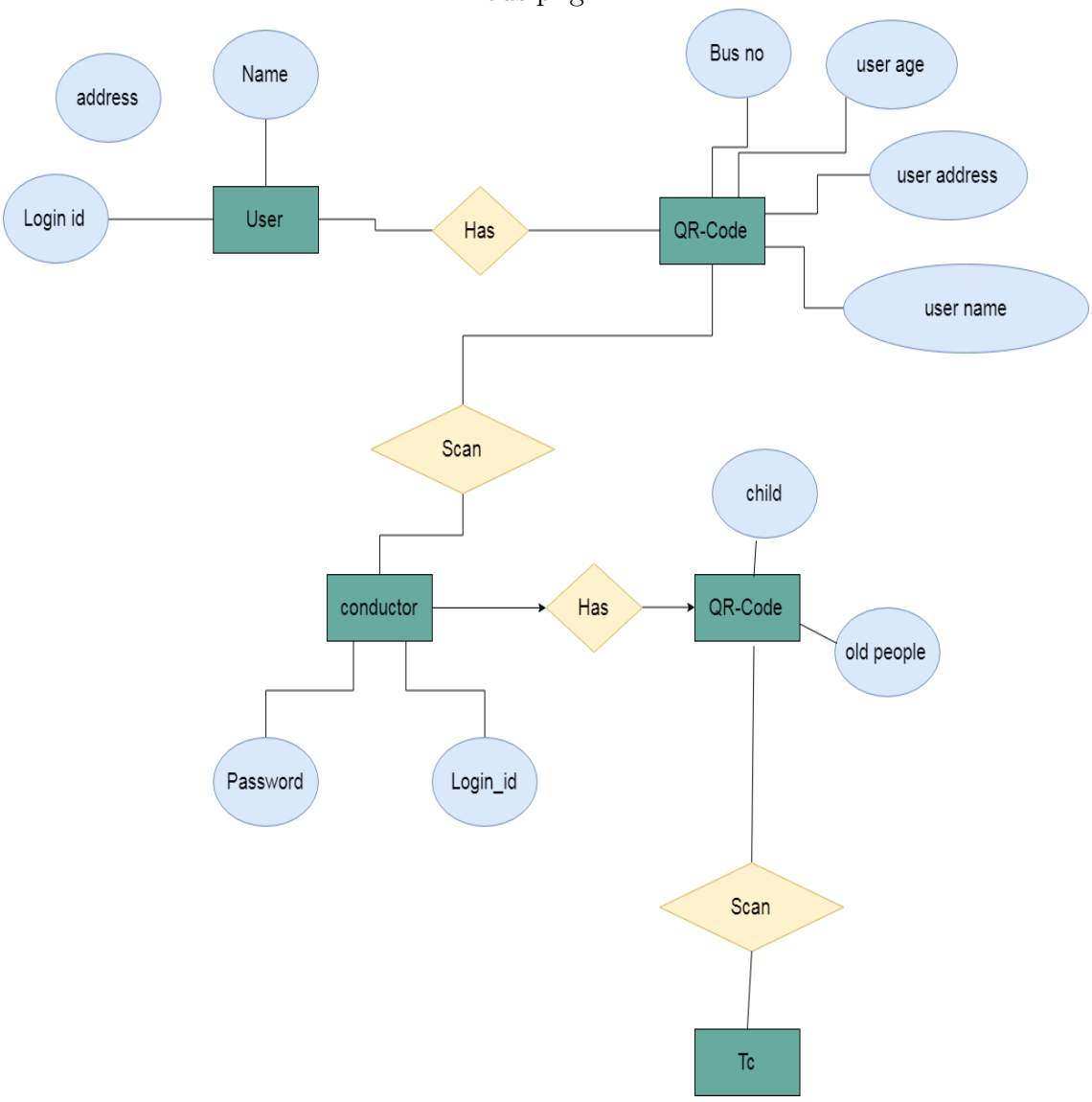

Figure 4.11: ER Diagram

Chapter 5
Implementation

5.1 Methodology

5.1.1 Methodologies to implement the system modules:

1. User
2. Conductor
3. QR code
4. Admin

Module Description:

User:register him/herself in system with personal credentials and book ticket.
Conductor: scans user QR code and validates the user.
System: Generate QR code verify, QR code and store data for further purpose.
Admin : Monitor data and analyze data for further purpose.

Table 5.1: Methodology

Sr.No.	description	Module	Function
1	User Registers/login	User	Generates Unique QR code
2	Scans QR code	Conductor	Validate User
3	Store data in database	System	Generate and verify QR code
4	Manage transactions.	Admin	Analyze data

5.2 Algorithm Used

5.2.1 Haversine

Haversine is a waveform that is sinusoidal in nature, but consists of a portion of a sine wave superimposed on another waveform. The input current waveform to a typical off-line power supply has the form of a haversine. The haversine formula is used in electronics and other applications such as navigation. For example, it

helps in finding out the distance between two points on a sphere. The haversine formula determines the great-circle distance between two points on a sphere given their longitudes and latitudes.

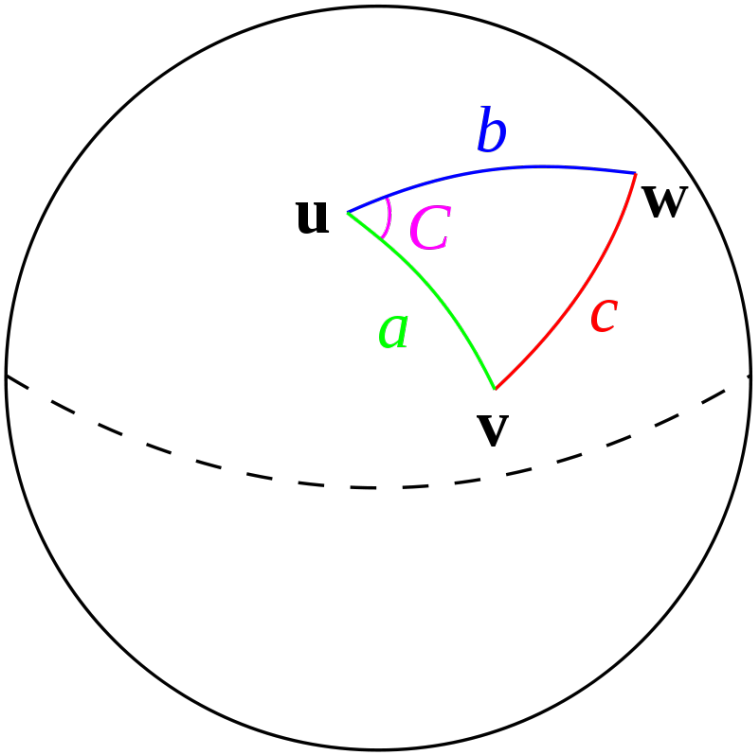

Figure 5.1: Haversine traingle

The haversine formula hav of is given by

$$\left(\frac{d}{r}\right) = haversine(\Phi_2 - \Phi_1) + cos(\Phi_1)cos(\Phi_2)haversine(\lambda_2 - \lambda_1)$$

Figure 5.2: hav(theta)

where r is the radius of earth(6371 km), d is the distance between two points, phi1, phi2 latitude of the two points and lambda1, lambda2 is longitude of the two points respectively.

Solving d by applying the inverse haversine or by using the inverse sine function, we get:

$$d = rhav^{-1}(h) = 2rsin^{-1}(\sqrt{h})$$

Figure 5.3: Total distance

OR

$$d = 2rsin^{-1}\left(\sqrt{sin^2\left(\frac{\Phi_2-\Phi_1}{2}\right) + cos(\Phi_1)cos(\Phi_2)sin^2\left(\frac{\lambda_2-\lambda_1}{2}\right)}\right)$$

Figure 5.4: Total Distance

5.2.2 AES

Advance Encryption Standard

AES is more secure algorithm. It is established by U.S. National Institute of Standards and Technology in 2001[8]. AES is symmetric key algorithm that means same key is used for encryption and decryption. So we use the AES algorithm to secure the information i.e. stored in QR code. After that we can say that our QR code is secure QR code.

This algorithm is generally divided in to two steps. The following step is involved:-
Step1- Convert the data into QR code
- When the data is too large then compress the data using compression algorithm.
- For security we encrypt the compressed data.
- After that QR code generated.

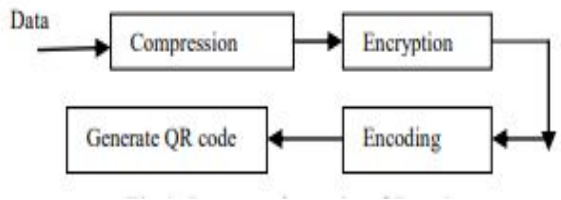

Figure 5.5: Process of creating QR code

Step2- Convert the QR code into data
After getting the QR code we decrypt the data using decryption algorithm.
- Then decompressed the data.
- After that we get original data.

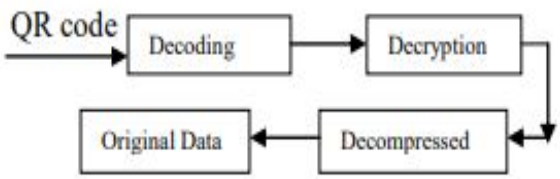

Figure 5.6: Process of scanning QR code

Figure 5.7: Structure of QR 2D barcode

Chapter 6
Result and Evaluation

6.1 Result

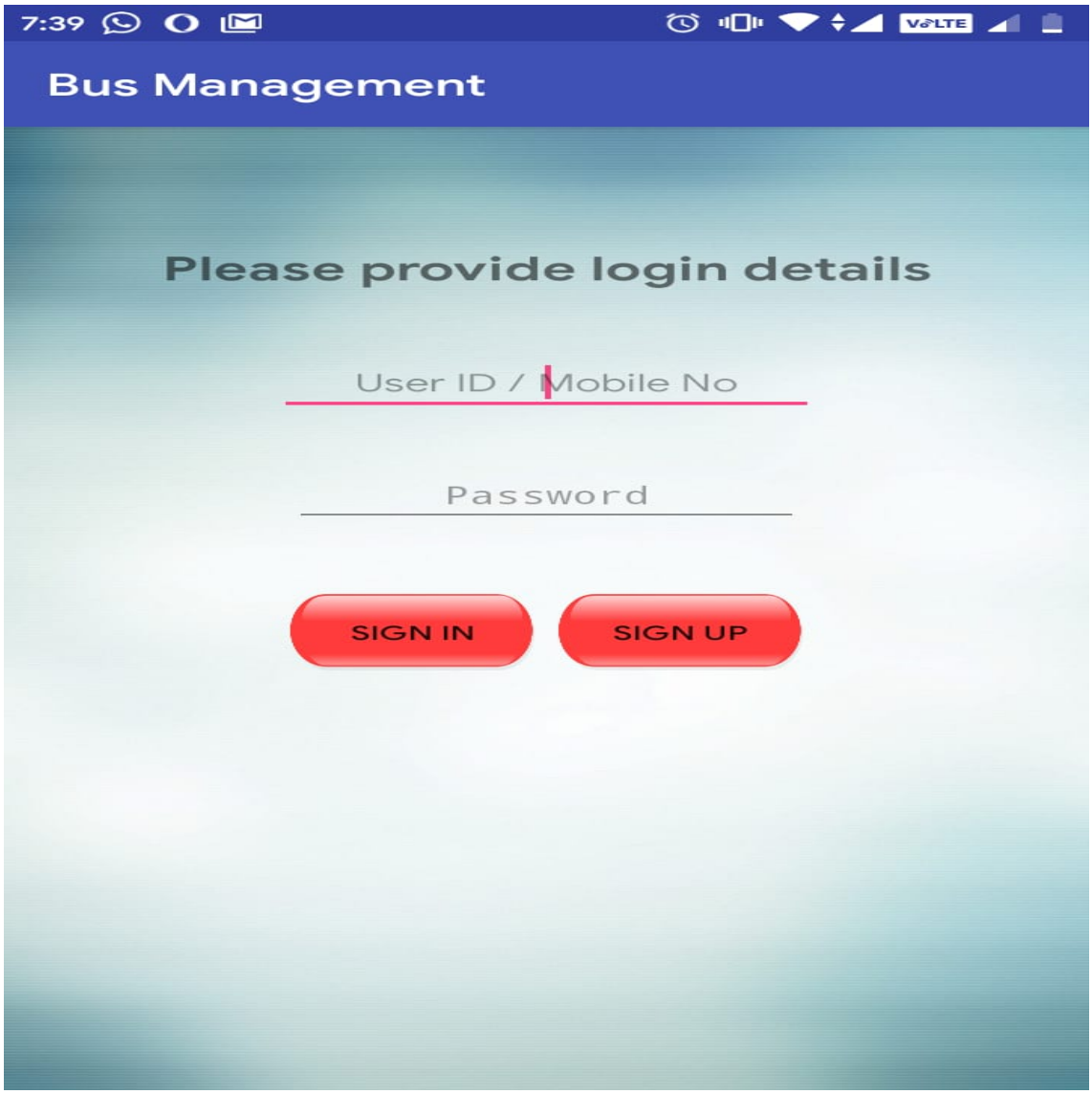

Figure 6.1: Login UI

Figure 6.2: Bus Management

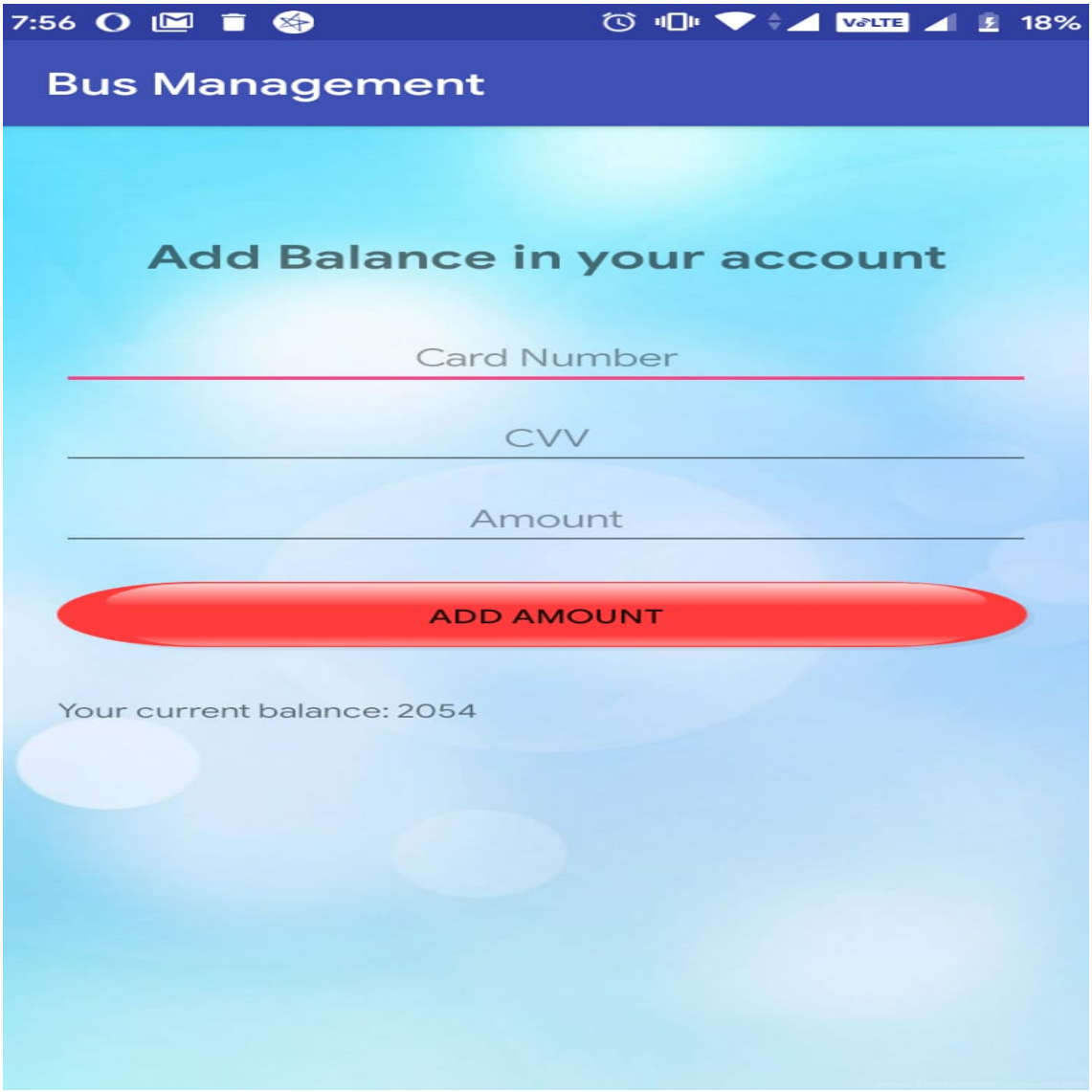

Figure 6.3: Add Amount UI

Figure 6.4: Book Ticket UI

Figure 6.5: Ticket UI

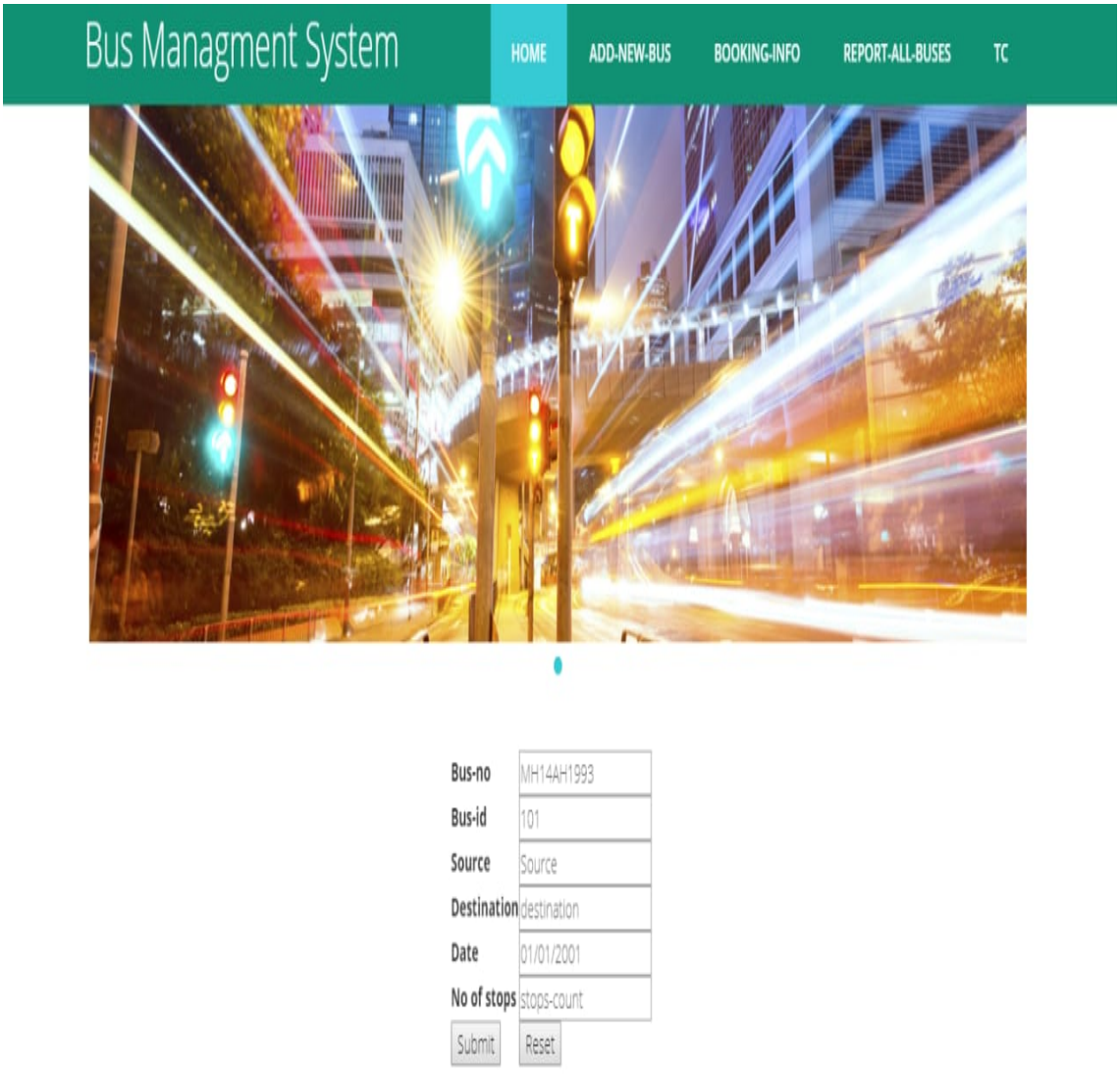

Figure 6.6: Add Bus UI

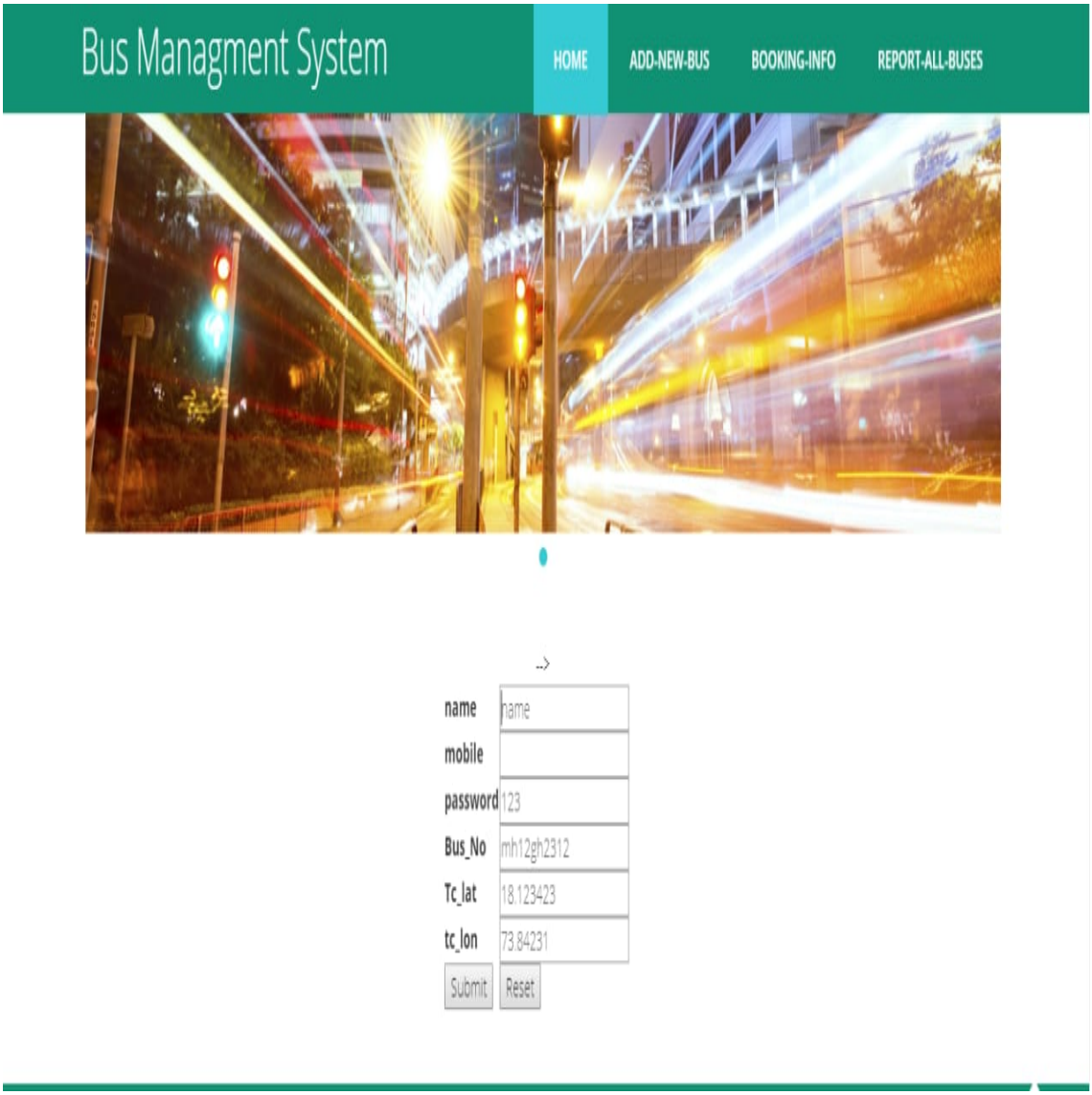

Figure 6.7: Add TC UI

Figure 6.8: User Information UI

Chapter 7
Evaluation

7.1 Testing

Software testing is an investigation conducted to provide stakeholders with information about the quality of the product or service under test. Software testing can also provide an objective, independent view of the software to allow the business to appreciate and understand the risks of software implementation. Test techniques include the process of executing a program or application with the intent of finding software bugs (errors or other defects), and verifying that the software product is fit for use. Some software testing tasks, such as extensive low-level interface regression testing, can be laborious and time-consuming to do manually. In addition, a manual approach might not always be effective in finding certain classes of defects. Test automation offers a possibility to perform these types of testing effectively. Once automated tests have been developed, they can be run quickly and repeatedly. Many times, this can be a cost-effective method for regression testing of software products that have a long maintenance life

7.2 Automation Testing

Test automation tools can be expensive, and are usually employed in combination with manual testing. Test automation can be made cost-effective in the long term, especially when used repeatedly in regression testing. A good candidate for test automation is a test case for common ow of an application, as it is required to be executed (regression testing) every time an enhancement is made in the application. Test automation reduces the effort associated with manual testing. One way to generate test cases automatically is model-based testing through use of a model of the system for test case generation, but research continues into a variety of alternative methodologies for doing so. In some cases, the model-based approach enables non-technical users to create automated business test cases in plain English so that no programming of any kind is needed in order to congure them for multiple operating systems, browsers, and smart devices.

Table 7.1: Test Case Table

Test ID	**Objective**	**I/P Data**	**Expected Result**	**Status**
TC1	Encrypt user details in QR Code	User booking details	Unique QR code generation	Pass
TC2	Get details from QR code	Scan QR code	Retrieve all details of user	Pass
TC3	Add balance in wallet	Amount and card details	Wallet amount updated	Pass
TC4	Analyse travellers data	Stored data from database	Graph of adult and children tickets	Pass

Chapter 8
Conclusion

We have successfully surveyed older systems and found that our newly system has more advantage and can be very helpful to passengers in booking tickets online and tracking bus. It will also be helpful to Public transport management team as they can analyze data and smoothen the functioning of overall transport system.

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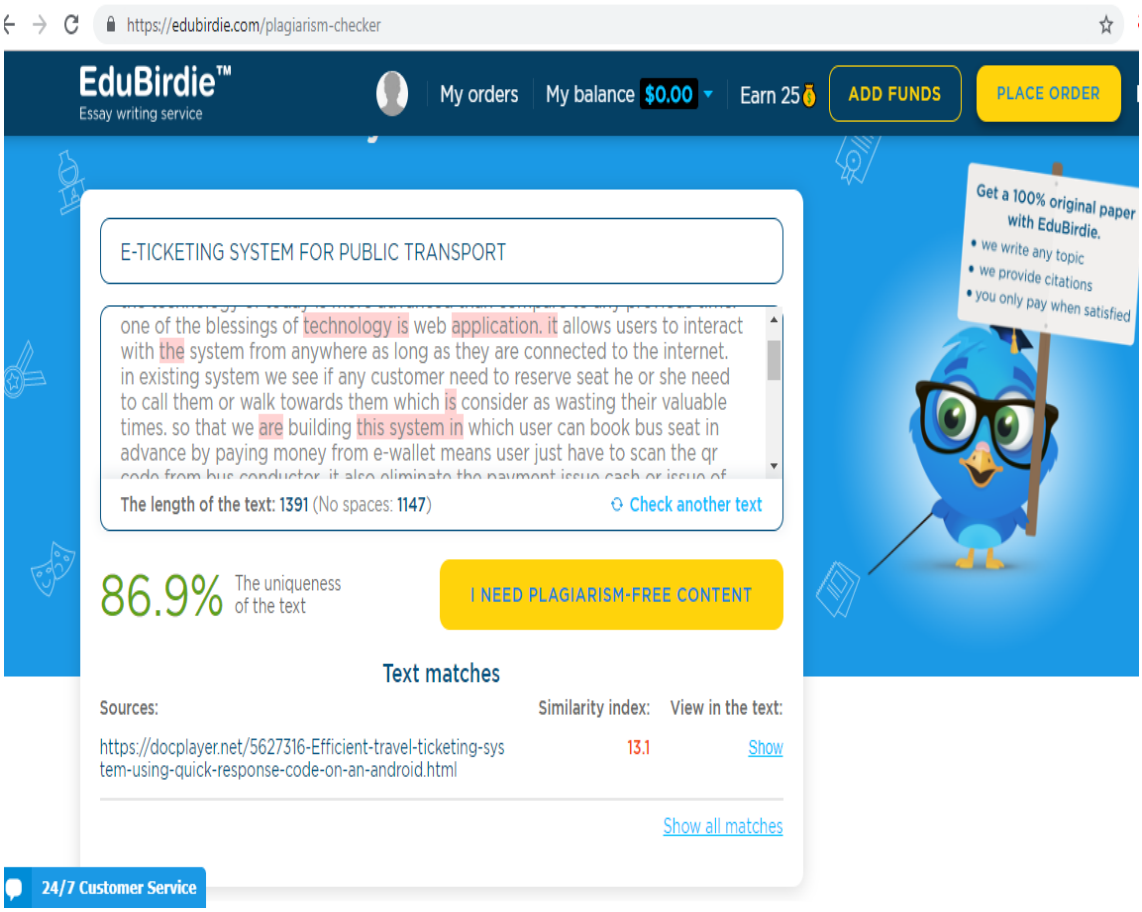
Annexure A
Base Paper

Annexure B
Plagiarism Report


https://edubirdie.com/plagiarism-checker
EduBirdie™
Essay writing service
My orders
My balance $0.00
Earn 25
ADD FUNDS
PLACE ORDER
E-TICKETING SYSTEM FOR PUBLIC TRANSPORT
one of the blessings of technology is web application. it allows users to interact with the system from anywhere as long as they are connected to the internet. in existing system we see if any customer need to reserve seat he or she need to call them or walk towards them which is consider as wasting their valuable times. so that we are building this system in which user can book bus seat in advance by paying money from e-wallet means user just have to scan the qr
The length of the text: 1391 (No spaces: 1147)
Check another text
86.9% The uniqueness of the text
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