

PROJECT REPORT
ON
Parking Management System

B.Tech (CE) Sem-VI
In the Subject of
Service Oriented Computing (CE-619)

Ayush Patel (CE-087) (17CEUOG067)
Rushi Parmar (CE-084) (17CEUBS112)

Under the Guidance of
Prof. Ankit P. Vaishnav



Department Of Computer Engineering
Faculty Of Technology,
Dharmsinh Desai University, Nadiad.

DHARMSINH DESAI UNIVERSITY

College Road, NADIAD-387001 (Gujarat)



CERTIFICATE

This is to certify that the term work carried out in the subject of **Service Oriented Computing** and recorded in this report is bonafide work of

Mr. Ayush Patel (Roll No.:087, Id:17CEUOG067)

and

Mr. Rushi Parmar (Roll No.:084, Id:17CEUBS112)

of **B.Tech Semester 6th** in the branch of Computer Engineering during the academic year 2019-20.

Prof. Ankit P. Vaishnav
(Project Guide and Assistant Professor)
Faculty of Technology,
Dharmsinh Desai University,
Nadiad.

Dr. C.K Bhensdadia
Head of CE Dept.,
Faculty of Technology,
Dharmsinh Desai University,
Nadiad.

Contents

1. Abstract.....	4
2. Introduction.....	5
3. Software Requirement Specifications.....	7
4. Design.....	11
5. Implementation Detail.....	19
6. Testing.....	22
7. Screen-shots.....	23
8. Conclusion.....	28
9. Limitation and Future Extension.....	29
10. Bibliography.....	30

Abstract

There are many issues associated with the local parking practices, starting from minor issues like not having certainty of available parking slot to some major issues like faults in Parking Fee Calculation. Hence these practices can't be considered as reliable.

To overcome these issues of local parking practices, there arise a need for online Parking System. Parking Management System Project is an online web application providing Reliable, Fast, Error Free and Efficient Solution to handle the daily-life parking problems.

1. Introduction

1.1 Introduction of Parking Management System

Parking Management System is an online web application designed in .NET framework, C# programming language created as ASP.NET web application and Windows forms. Main motive of building this system is to make Parking Management Easier and Accessible from throughout the world. By using this System, Parking will be lot easier and certain than the current situation. Users will be able to reserve their parking slots in advance and also pay their parking fees online, saving a lot of time of users.

Features of Parking Management System :-

- Users will be able to reserve Parking Slot, based on given Vehicle Type, arrival and exit time and choice of slots. Particular booked slot will remain available for the given Time Stamps. Cancellation of already booked slots is also possible.
- System Records history of each and every parked vehicle, which can be viewed only by admin.
- Software System calculates the parking fee and there are provisions for online payment of fees..
- Account Management is also supported by this System, through which users can create, update or delete their profiles online.

1.2 Technology/Platform/Tools Used

.NET Framework:

The .NET framework is a software development framework from Microsoft. It provides a controlled programming environment where software can be developed, installed and executed on Windows-based operating systems.

C# Language:

C# is a general-purpose, multi-paradigm programming language encompassing strong typing, lexically scoped, imperative, declarative, functional, generic, object-oriented, and component-oriented programming disciplines.

Windows Form:

Windows Forms is a free and open-source graphical class library included as a part of Microsoft .NET Framework or Mono Framework, providing a platform to write rich client applications for desktop, laptop, and tablet PCs.

ASP.NET:

ASP.NET is an open-source server-side web-application framework designed for web development to produce dynamic web pages developed by Microsoft to allow programmers to build dynamic web sites, applications and services.

SQL Server:

Microsoft SQL Server is a relational database management system developed by Microsoft. As a database server, it is a software product with the primary function of storing and retrieving data as requested by other software applications—which may run either on the same computer or on another computer across a network.

2. Software Requirement Specifications

Parking Management System

R.1 Manage Users

Description: Admin or GateKeeper can Manage user's data.

R.1.1 Add User

Description: Admin Register new user here.

Input: User Personal Details

Output: Generate user Id

R.1.2 Remove User

Description: Admin can Remove user here.

Input: User Id

Output: Success message

R.1.3 Update User Credit

Description: System Accepts credit balance amount.

Input: User Id, Amount

Output: Success message

R.1.4 View All Users

Description: Admin can view all users here

Input: User Selection

Output: List of users

R.1.5 Search Users

Description: Admin can search user here.

Input: User Id or name

Output: List of users

R.2 Manage Slots

Description: Admin can Manage Total Slots.

R.2.1 Add Slots

Description: Admin adds slots.

Input: Slot Info

Output: Generate Slot Id

R.2.2 Remove Slot

Description: Admin can Remove Slot here.

Input: Slot Id

Output: Success message

R.3 Booking Module

Description: Slots can be viewed, booked or emptied through here.

R.3.1 Vehicle Entry

Description: Slot is confirmed here.

Input: Plate number, Username, Arrival Time, Exit Time, Slot Id

Output: Generate Booking Id

R.3.2 Vehicle Exit

Description: Departure is noted.

Input: Booking Id

Output: Success message

R.3.3 Show Available Slots

Description: Gatekeeper can see available slots

Input: User Selection, Type of Slots

Output: List of Slots

R.4 Manage Transactions

Description: Admin can notice & record of all issued books by user.

R.4.1 Calculate Cost

Description: Cost is calculated based on departure time and fine

Input: Booking Id, Departure Time

Output: Cost of Booking

R.4.2 Generate Receipt

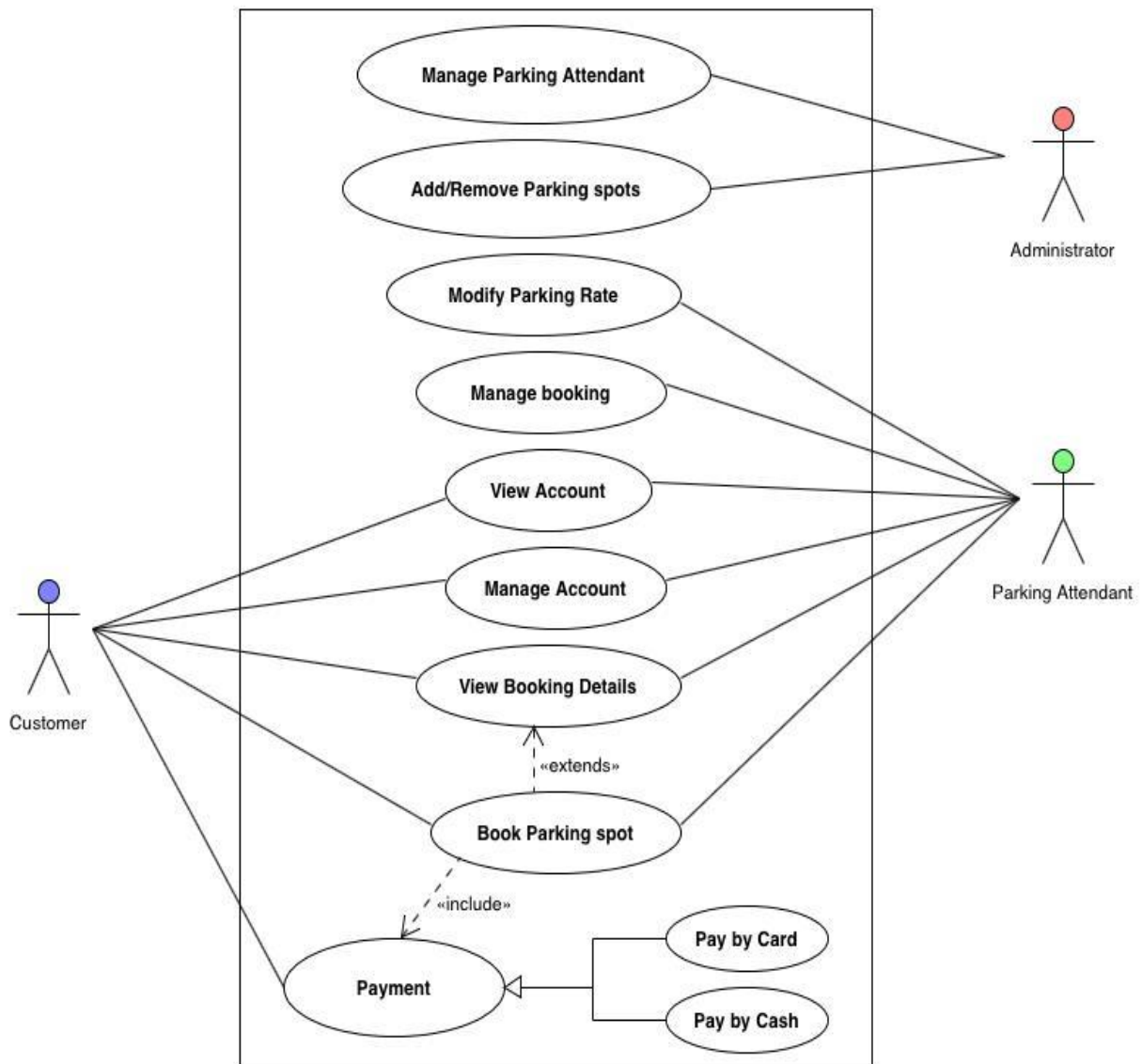
Description: System Generates receipt for payment

Input: Booking Id, Calculated cost

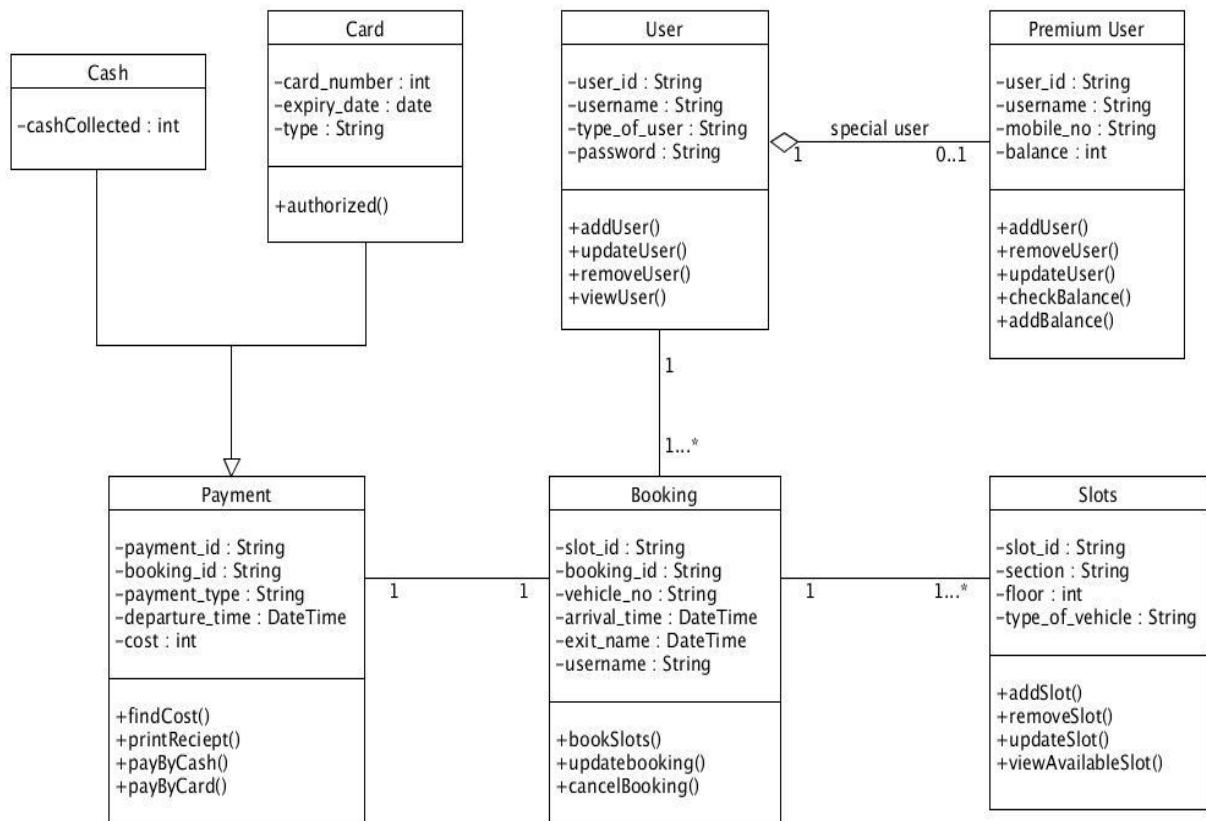
Output: Payment Receipt

3. Designs

1. Usecase Diagram :-

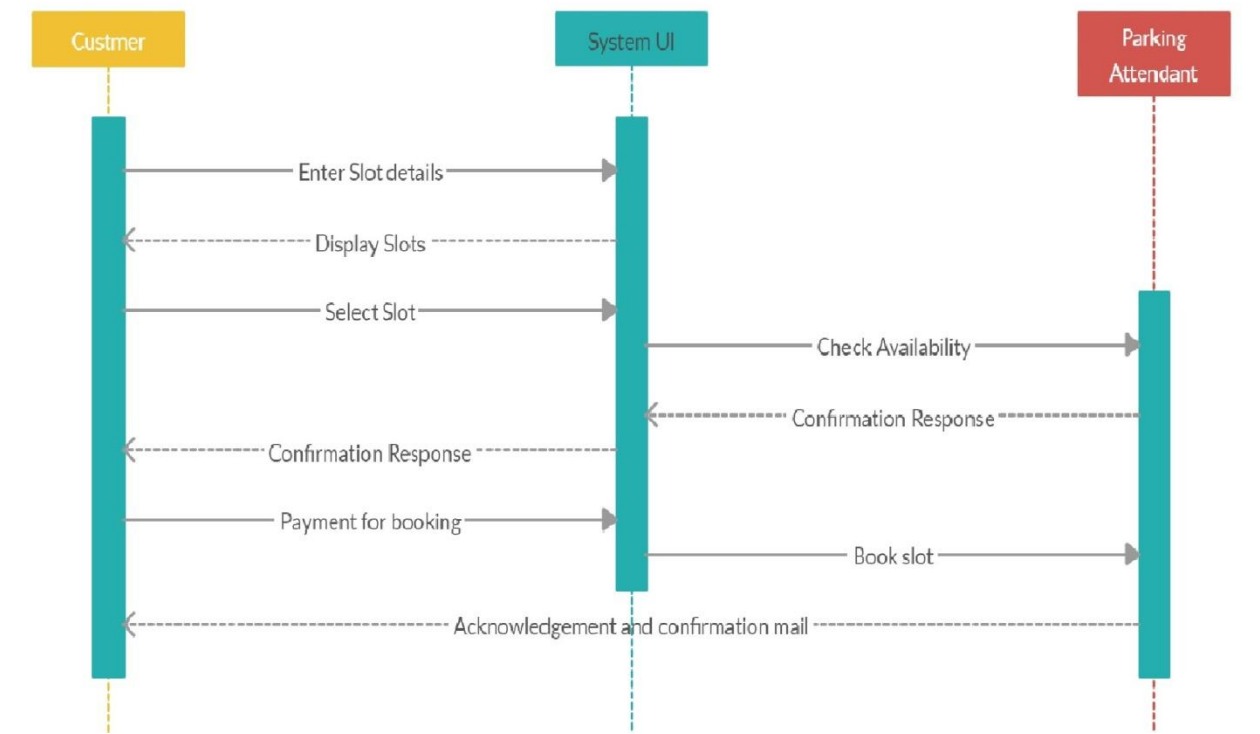


2. Class Diagram :-



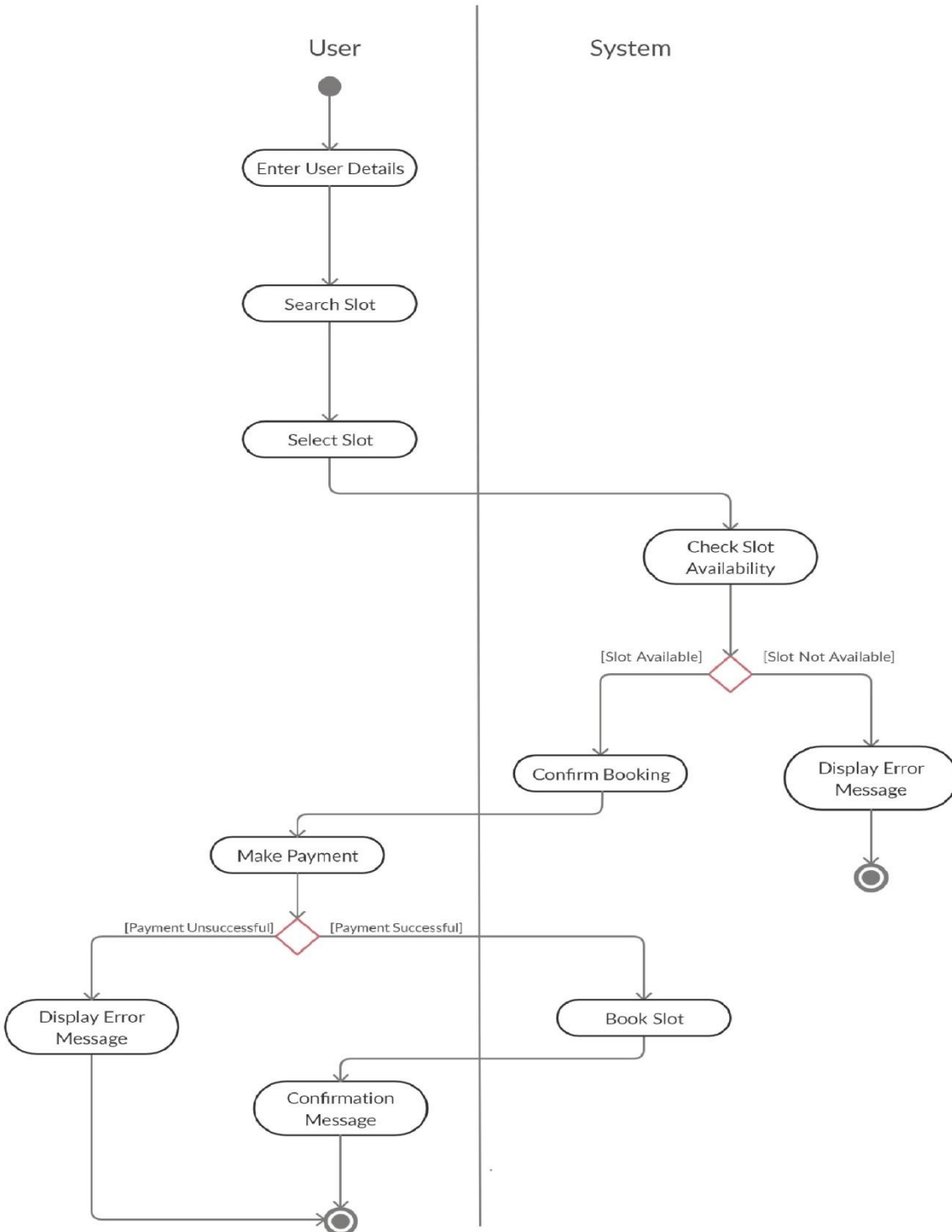
3. Sequence Diagram :-

Sequence Diagram for Booking a slot Successfully

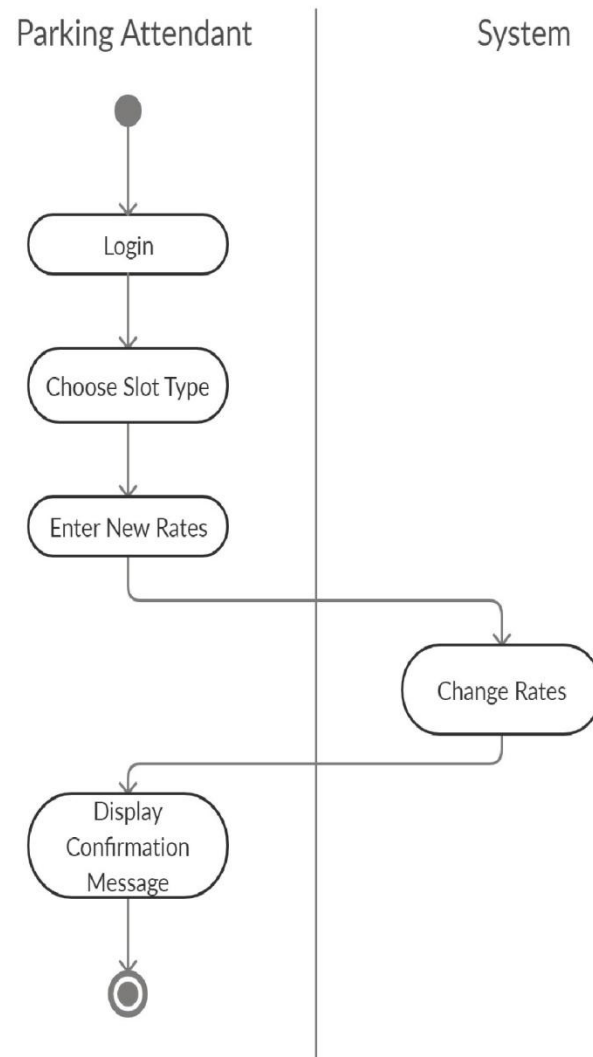


4. Activity Diagram :-

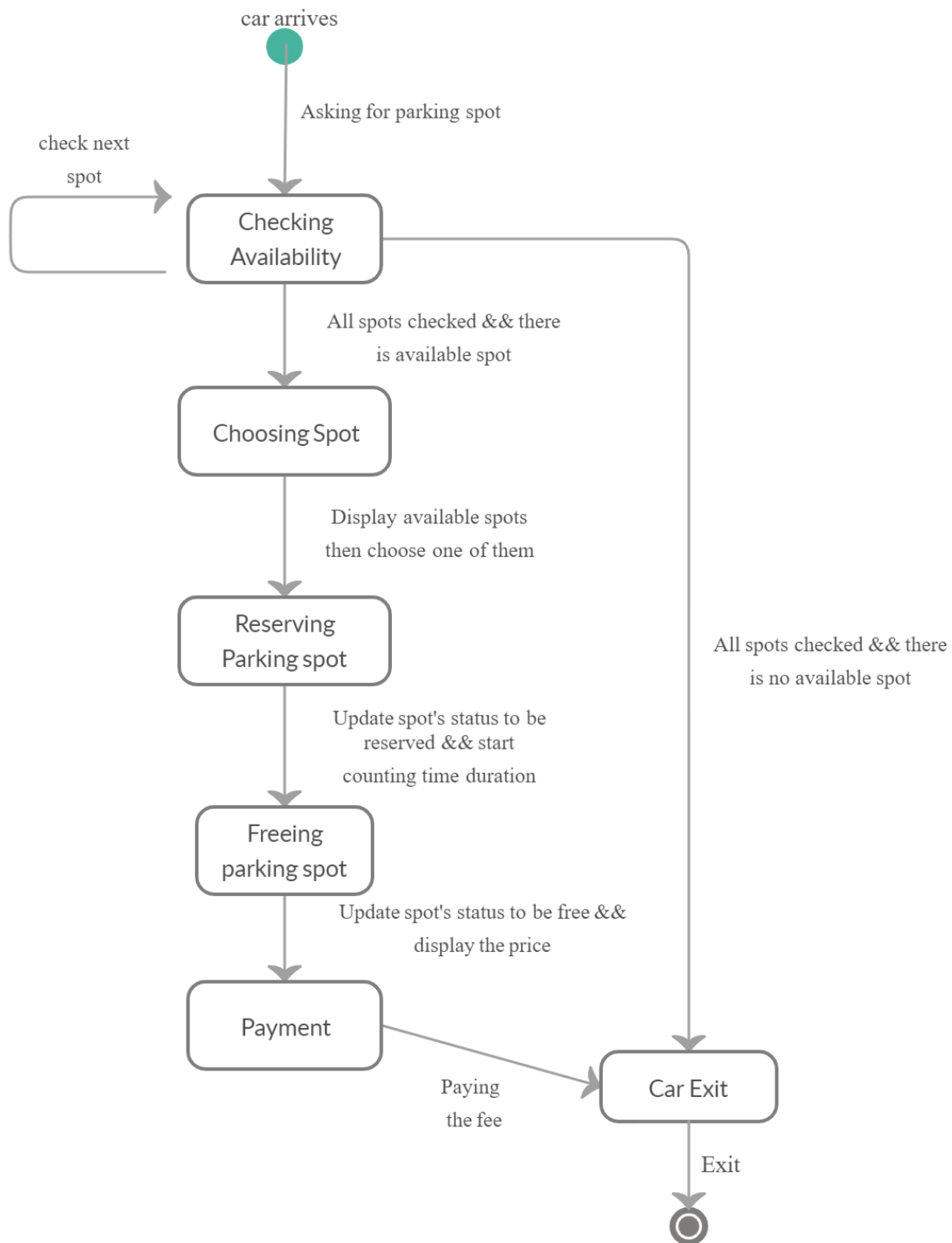
Activity Diagram for Booking a Slot



Activity Diagram for managing slot rates

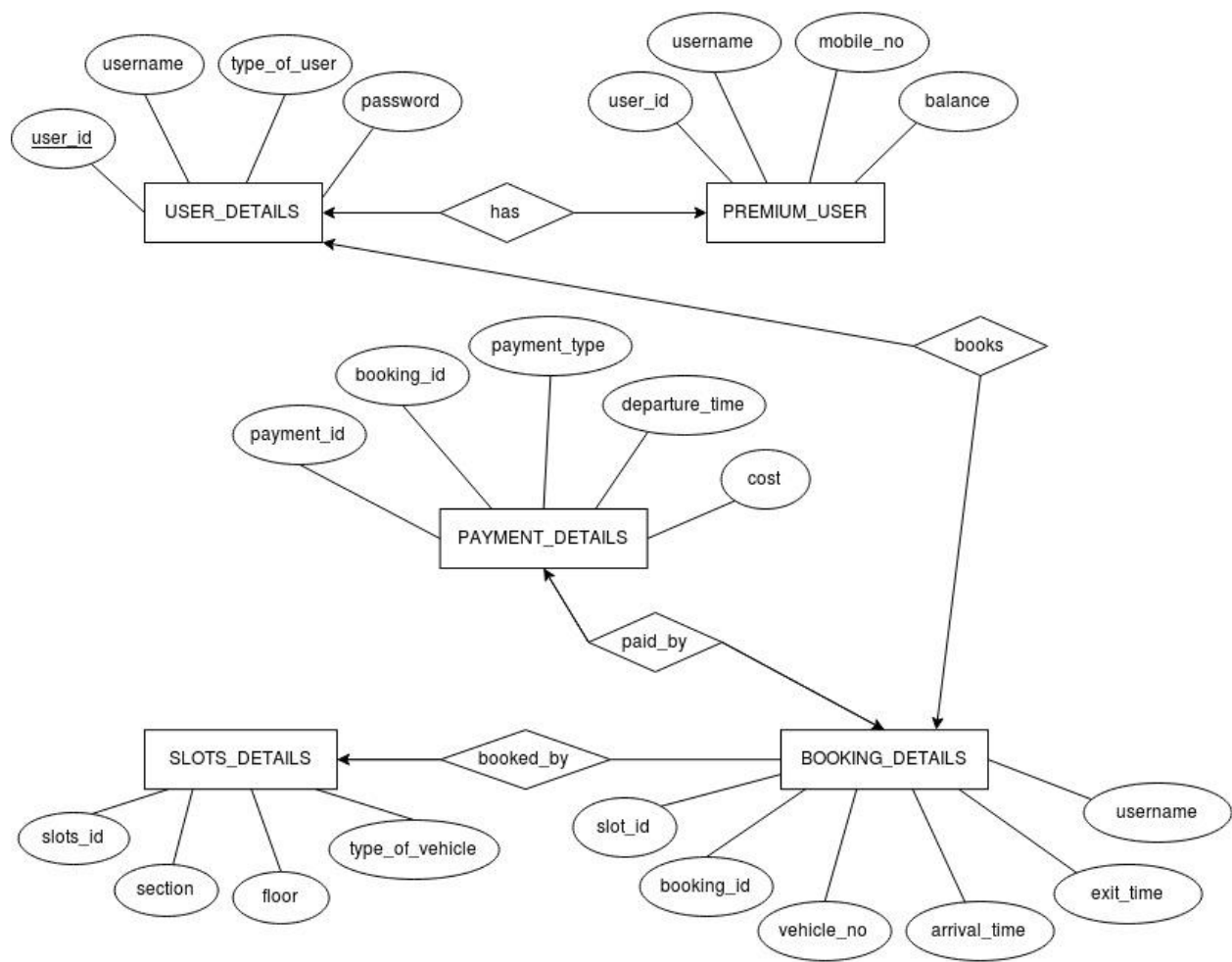


5. State Diagram :-



6. ER Diagram :-

ER Diagram for Parking Management System



7. Data Dictionary :-

User_Details

Name of Field	Type	Size
User_Id	Varchar2	20
Username	Varchar2	20
Type of User	Varchar2	10
Password	Varchar2	20

Premium_User

Name of Field	Type	Size
User_Id	Varchar2	20
Username	Varchar2	20
Mobile_No	Number	10
Balance	Number	10

Payment_Details

Name of Field	Type	Size
Payment_Id	Varchar2	20
Booking_Id	Varchar2	20
Payment_Type	Varchar2	10
Departure_Time	DateTime	
Cost	Number	5

Slots_Details

Name of Field	Type	Size
Slots_Id	Varchar2	20
Section	Varchar2	10
Floor	Number	3
Type of Vehicle	Varchar2	20

Booking_Details

Name of Field	Type	Size
Slot_Id	Varchar2	20
Username	Varchar2	20
Booking_Id	Varchar2	20
Arrival_Time	DateTime	
Exit_Time	DateTime	
Vehicle_No	Varchar2	10

4. Implementation Details

4.1 Description of Modules :-

1. Register User Module

Basic information of user is taken by system and stored in database.

2. Login User Module

Users are able to login themselves. System logs user in, then and only then user can use other functionalities of system.

3. Slot Management Module

Basic function of slot management include Add Slots and Remove Slots. Only admin can use this module for registering any changes in parking environment.

4. Booking Module

Booking module is main Module of this System. The functions inside this module are Book Slot, Cancel Booking and Show Available Slots. These are some of the major functions of this System.

5. Payment Module

This module has functions like Calculate Cost and Online Payment Facility which handles economic side of System.

6. Admin Module

Admin panel to manage slots (add/remove slots) , view user details and booking history of the entire system.

4.2 Function prototype which implements major functionality

Major Functions along with the prototypes according to C# language is as shown below:

1. Account Management Functions

User **loginUser**(string Email, string Password);

int **registerUser**(User User);

void **updateUser**(User user, string Email);

void **deleteUser**(string Email);

2. Booking Management Function

bookingResult **bookSlot**(string section, int floor, string type, int userid, string vehicleno, DateTime arrivaltime, DateTime exittime);

int **cancelBooking**(int bookingId, int userId);

List<Booking> **showBookings**(int userId);

3. Make Payment Function

int **makePayment**(int paymentId, string paymentType);
exitResult **exitVehicle**(int bookingId, DateTime exitTime);

4. Slots Management Function

int **addSlots**(string section, int floor, string type,int normalCharge, int overtimeCharge, int amount);
int **removeSlots**(string section, int floor, string type, int amount);

5. Testing

For Testing the System, a mixed approach comprised of Integration Testing and Regression Testing is used.

Any module is Tested using Integration Testing where we test the unit parts and then combine those unit parts to form a Module.

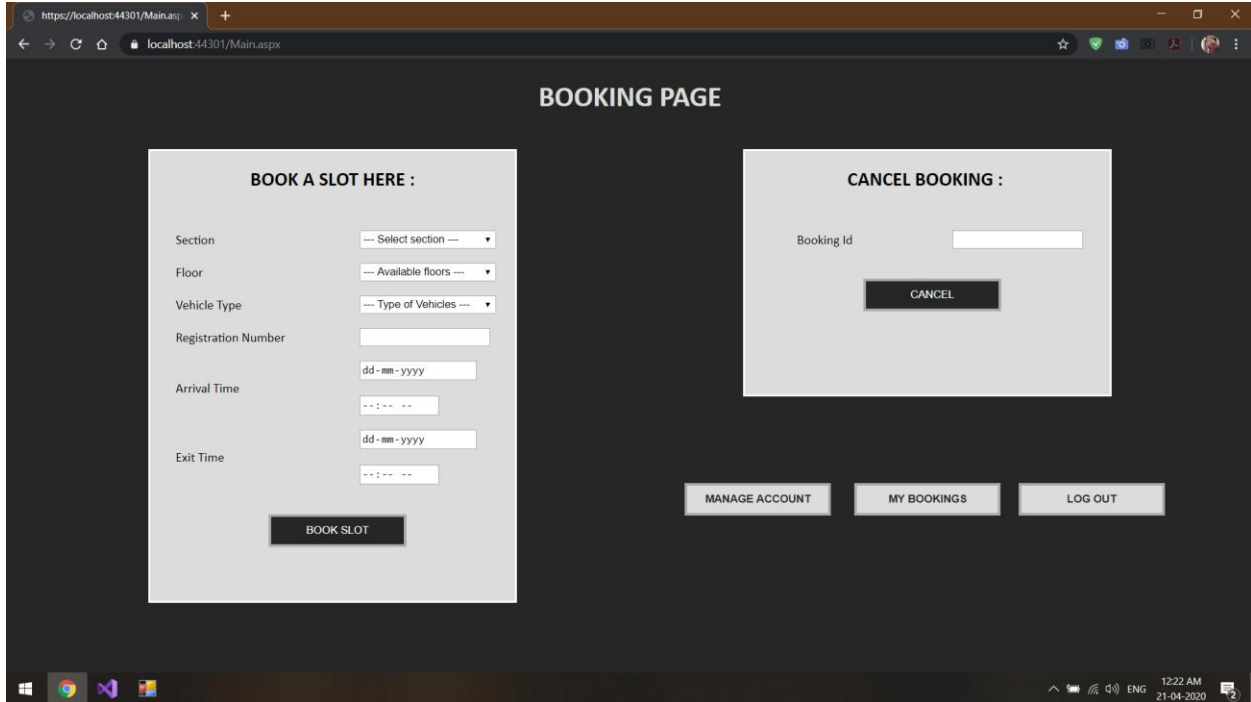
For ex. For creating Slot Management Module, first basic functions like Add slot and Remove slot are tested, then the Slot Management is Created and Tested if it works properly.

After any module is created, now by the rules of Regression Testing, this module is added to the whole system and then whole system is tested and it is made sure that the whole system works as desired after adding module to system.

For ex. After successfully creating Slot Management Module, it is added to System and then whole current System is tested to ensure proper working.

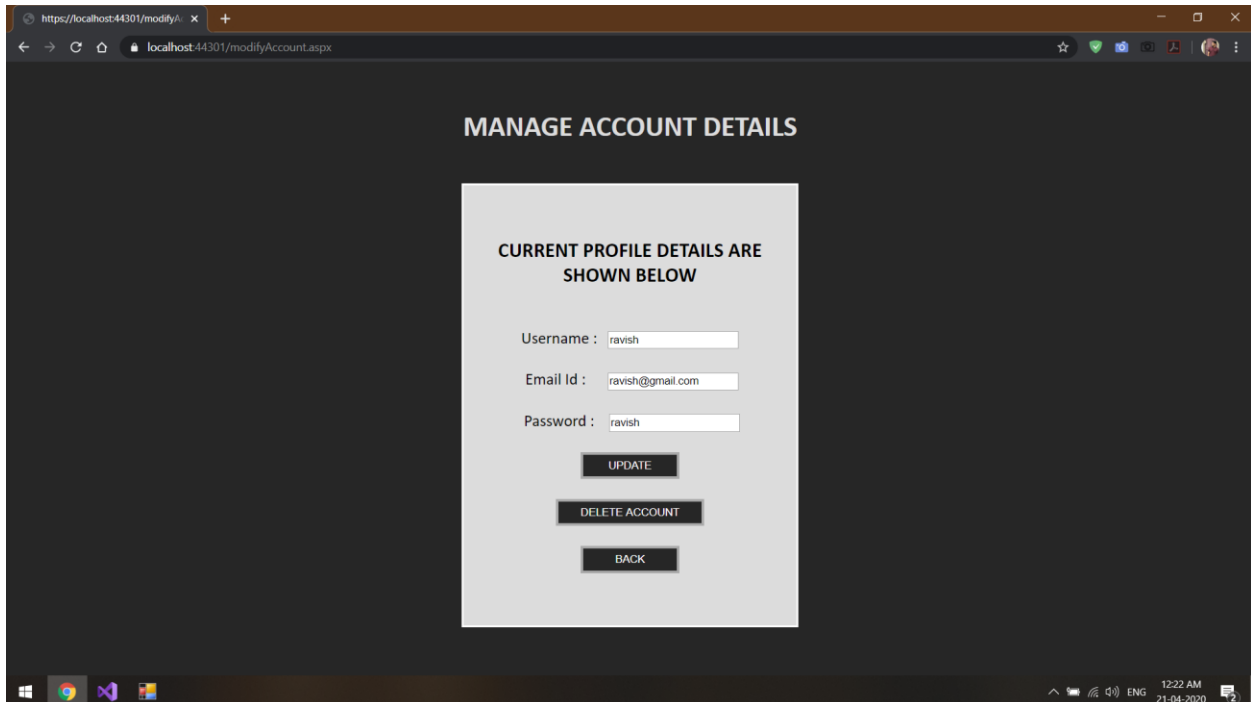
6. Screenshots

1. Booking Panel for User :-



The screenshot shows a web browser window with the URL `https://localhost:44301/Main.aspx`. The page title is "BOOKING PAGE". It features two main panels. The left panel, titled "BOOK A SLOT HERE :", contains a form with the following fields: "Section" (dropdown menu), "Floor" (dropdown menu), "Vehicle Type" (dropdown menu), "Registration Number" (text input), "Arrival Time" (date-time picker), and "Exit Time" (date-time picker). A "BOOK SLOT" button is at the bottom of this panel. The right panel, titled "CANCEL BOOKING :", contains a "Booking Id" text input and a "CANCEL" button. Below these panels are three buttons: "MANAGE ACCOUNT", "MY BOOKINGS", and "LOG OUT". The Windows taskbar at the bottom shows the time as 12:22 AM on 21-04-2020.

2. Account Management Panel :-



The screenshot shows a web browser window with the URL `https://localhost:44301/modify/`. The page title is "MANAGE ACCOUNT DETAILS". It features a central panel titled "CURRENT PROFILE DETAILS ARE SHOWN BELOW" containing the following fields: "Username" (text input with value "ravish"), "Email Id" (text input with value "ravish@gmail.com"), and "Password" (text input with value "ravish"). Below these fields are three buttons: "UPDATE", "DELETE ACCOUNT", and "BACK". The Windows taskbar at the bottom shows the time as 12:22 AM on 21-04-2020.

3. Personal Booking history (Based on User) :-

The screenshot shows a web browser window with the URL `https://localhost:44301/booking.aspx`. The page title is "MY BOOKINGS". Below the title, there is a section titled "Currently Active Bookings" containing a table with the following data:

Booking Id	Slot Id	Plate Number	Arrival Time	Exit Time
4007	6	GJ07VV5656	25-10-2020 05:05:00 AM	25-10-2020 06:05:00 AM
4008	3033	GJ07VV5656	27-08-2020 10:05:00 PM	27-08-2020 11:05:00 PM

Below the table, there is a "BACK" button.

4. Admin Panel :-

The screenshot shows a web browser window with the URL `https://localhost:44301/Manage.aspx`. The page title is "ADMIN PANEL". The page is divided into three main sections:

- SLOT DETAILS:** A table showing slot details for different sections and floors.

SECTION : Main	
Floor : 1	4 Wheeler : 2 Bicycle : 1
Floor : 4	4 Wheeler : 1 6 Wheeler : 1
SECTION : Sec1	
Floor : 2	6 Wheeler : 1
Floor : 3	Heavy Vehicle : 1
Floor : 5	Heavy Vehicle : 2
SECTION : Sec2	
Floor : 1	Bicycle : 1
Floor : 2	Bicycle : 3
SECTION : Sec3	
Floor : 3	Bicycle : 3
- Add Slots -----:** A form with fields for Section, Floor, Type, Normal Charges, Overtime Charges, and No. of Slots. There is an "ADD SLOTS" button.
- Remove Slots ----:** A form with fields for Section, Floor, Type, and No. of Slots. There is a "REMOVE SLOTS" button and a message "Slots are booked cannot be deleted".

At the bottom of the page, there are four buttons: "VIEW BOOKINGS", "VIEW USERS", "LOG OUT", and "MANAGE ACCOUNT".

5. All Booking Details (Admin) :-

https://localhost:44301/manage X +

localhost:44301/managebooking.aspx

BOOKINGS HISTORY

Booking Id	User Id	Slot Id	Plate Number	Arrival Time	Exit Time
1	3	6	GJ07BA5454	13-03-2020 11:07:00 AM	13-03-2020 12:08:00 PM
2	2	7	GJ05SS5959	13-03-2020 11:07:00 AM	13-03-2020 12:08:00 PM
1001	2006	6	RJ03A28888	25-10-2020 01:01:00 PM	26-10-2020 02:01:00 PM
1002	2006	1038	MH02SD2074	25-10-2020 01:01:00 PM	26-10-2020 01:01:00 PM
2001	2006	9	GJ07MS8989	01-10-2030 02:02:00 PM	02-10-2030 02:02:00 AM
2002	2006	1036	MH02SD2074	20-10-2020 01:01:00 PM	20-10-2020 02:01:00 PM
2003	2006	1036	MH02SD2074	25-10-2020 01:00:00 AM	25-10-2020 02:00:00 AM
2004	2006	6	DD05MS9763	25-10-2020 03:00:00 PM	25-10-2020 05:00:00 PM
2005	2006	3033	GJ07MS8989	20-04-2020 01:35:00 PM	20-04-2020 02:35:00 PM
3001	2006	1036	GJ10EW9173	20-10-2020 05:05:00 PM	20-10-2020 06:06:00 PM
4007	2006	6	GJ07VV5656	25-10-2020 05:05:00 AM	25-10-2020 06:05:00 AM

ACTIVE BOOKINGS

Booking Id	User Id	Slot Id	Plate Number	Arrival Time	Exit Time
4008	2006	3033	GJ07VV5656	27-08-2020 10:05:00 PM	27-08-2020 11:05:00 PM
4009	2006	3033	GJ07DD5656	15-05-2020 05:05:00 PM	16-05-2020 06:05:00 PM

BACK

12:32 AM
21-04-2020

6. End User Details Panel (Admin) :-

https://localhost:44301/viewuse X +

localhost:44301/viewusers.aspx

ADMIN PANEL

END USER DETAILS

User Id	User Name	Email Address
1	rushi	rushi@gmail.com
2	ayush	ayush@gmail.com
3	nilya	nilay@gmail.com
1004	ramin	ramin@gmail.com
2006	ravish	ravish@gmail.com

BACK

12:48 AM
21-04-2020

7. WindowsForm for GateKeeper :-

The screenshot shows a Windows Form titled "Form1" with a dark brown title bar. The form has a light gray background and contains two main sections:

- Exit Vehicle**: This section is located in the upper half of the form. It includes a label "Exit Vehicle" followed by a "Booking Id" label and a text input box. Below the input box is a button labeled "Exit".
- Payment Tab**: This section is located in the lower half of the form. It includes a label "Payment Tab" followed by a "Cost" label. Below the "Cost" label is a "Payment Type" label and a dropdown menu. At the bottom of this section is a button labeled "Make Payment".

7. Conclusion

Parking management system is one of the most adopted and fastest growing Smart City Solution across the world. Smart Parking involves the use of low cost sensors, real-time data and applications that allow users to monitor available and unavailable parking spots. The goal is to automate and decrease time spent manually searching for the optimal parking floor, spot and even lot. A parking solution can greatly benefit both the user and the lot owner.

8. Limitation and future extension

Limitation:

This system is still in beta version. User interface can be improved for better communication between system and user.

Future Extension:

User interface of the system will be improved. Functionality and Front End will be improved to provide better interaction with system.

9. Bibliography

Book : C# Programming yellow book, Rob miles

Websites : www.tutorialspoint.com
<https://docs.microsoft.com/>

Search Engine: www.google.com