Software Requirement and Design Specifications

[RAILWAY RESERVATION SYSTEM]

Version: [1.0]

Course Code	SE2002
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Submission Date	25/05/2022

Table of Contents

1. Introduction

1.1. Purpose of Document

The purpose of this source is to describe the railway reservation system which provides the train details, reservations made, billing and cancellation on various types of reservations namely.

- Confirm Reservation
- Cancellation of a Reserved Ticket
- Inquire about Trains.

1.2. Intended Audience

i)**Public Users**

As a new user, You must have to create an account in order to access the application.These include the user's mobile numbers,email address and password. Once an account is created, users can now access different functions .

ii) **Management**

The management team confirms the ticket booking and maintains the notification regarding train timing,any unexpected situations etc.

iii)**Developers**

Developers are the frequent active users of this system because they have to implement every single change in the system or any update in the system.they also manage the User Interface(UI) of the system.

1.3 Definition of Terms, Acronyms and Abbreviations

Term	*Description*
GUI	*Graphical User Interface*
SRS	*Software Requirement Specification*
RRS	Railway Reservation System
PAKRAIL	Pakistan Railways

1.4 Document Convention

Convention for Info pages

- Font Face:Normal
- Font Style:Times New Roman
- Font size: 8

Convention for Project Pages:

- Font Face:Normal & Bold
- Font Style:Times New Roman
- Font size:140

2. Overall System Description

2.1. Project Background

Before our proposed system we saw some drawbacks in the existing system of our PAKRAIL. The system was slow, involved a lot of manual labor which resulted in frequent errors. Manual data comes with the risk of someone meddling with it causing damage. Updating data is difficult as well due to the data being on manual terms. Therefore, our new automated system comes with the following features in hopes of revolutionizing the railway system. Making the system automated through our computerized system. Chances of errors are less due to machine's involvement meanwhile updating data will also be easier through our system. No meddling will be there because every user will be provided by his ID in order to access the system.

2.2. Project Scope

The main purpose of this system is to operate all railway reservations efficiently and smoothly. It includes the details of each person, arrival time of the train, date, distance between the stations and train name. This system includes different components for booking different classes of trains (business class, local train, Air conditioned Trains).
To provide an improved and optimal method to revolutionize the railway systems. We have implemented a very user-friendly GUI so that a user of any skill level can easily access the system. It also includes help and guideline numbers that would be available 24/7. This system would run under professional management.

We have designed the system to perform these tasks:

- Search for specific train
- Booking at any specific train (if available)
- Doing Payments
- Cancelling a booked ticket
- Improved and faster service of PAKRAIL

2.3. Not In Scope

This application is currently available on only smartphones and on web browsers .There is no desktop application currently available.

2.4. Project Objectives

Before our proposed system we saw some drawbacks in the existing system of our PAKRAIL. The system was slow, involved a lot of manual labor which resulted in frequent errors. Manual data comes with the risk of someone meddling with it causing damage. Updating data is difficult as well due to the data being on manual terms. Therefore, our new automated system comes with the following features in hopes of revolutionizing the railway system. Making the system automated through our computerized system. Chances of errors are less due to machine's involvement meanwhile updating data will also be easier through our system. No meddling will be there because every user will be provided by his ID in order to access the system.

2.5. Stakeholders

BASIC EDUCATIONAL TYPE: User should be comfortable with the English and Urdu language in order to better access the system.
This system provides different services based on the user's type.

TECHNICAL EXPERTISE: User should be familiar with general daily life applications of computer and should have a slight knowhow of it

2.6. Operating Environment

This system operates in Android as well as IOS operating system.It is also available on web browsers.
"Pakistan Railways" mobile application shall work in all Android and IOS based environment.Internet is required to run this application.
The Hardware Configuration including :
CPU:1.3 GHz Dual-Core or above.
RAM:512 MB minimum,4GB built-in memory.Only support TouchPad Devices.

2.7. System Constraints

- **Cultural Constraints**
  Since it is a public application, it requires language which is easily understandable for common people so they can easily interact with it.So for this purpose “English” language is used while “Urdu” language is also used in this application for the guidance .

- **Legal constraints**
  Since this application is run under the control of the government of Pakistan, this application must provide full privacy of the user’s data leakage or the third party apps' influence.

2.8. Assumptions & Dependencies

- The first assumption is that a user must have an android or ios based mobile phone or computer system with internet access in order to use this RRS.
- The admin must have complete knowledge of the system. User must be logged in to the system with a valid username/password.
- Software is dependent on internet connection to access

3. External Interface Requirements

3.1. Hardware Interfaces

This application support Android,IOS mobile devices.No other Hardware required

3.2. Software Interfaces

For the mobile application,it needs device which have Android version 4.0 or higher and IOS version 10.3.4 to run this application

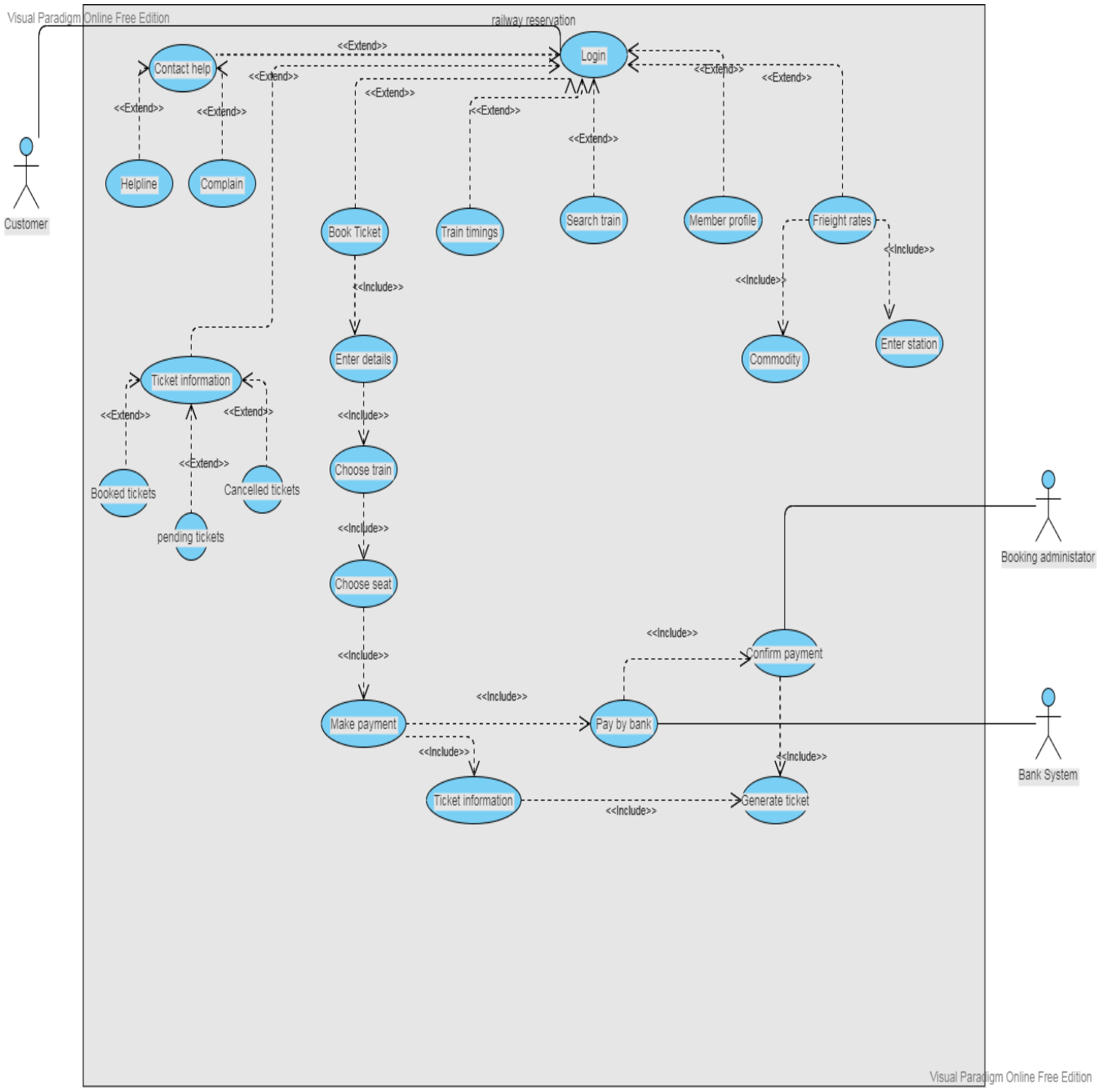
3.3. Communications Interfaces

This application is used to communicate with all android and ios devices.Wifi-Direct communication is supported in android platform.It also has communication with database in order to manage details of the different stakeholders.

4. Functional Requirements

4.1. Functional Hierarchy

Use Case Diagram



4.2. Use Cases

4.2.1. [Book Ticket]

Use Case Description	
Use Case name:	book ticket
Use Case Description:*user request for ticket booking .*	
Primary actor:*public user*	***Other actors:***
Stakeholders:	user/passenger
Relationships ▪ ***Includes:****i* ▪ ***Extends:*** exclude from login	
Pre-conditions: ▪*must be login*	
Flow of Events: ***1.*** *user login the system* *2. user make a request for ticket booking* ***3.****admin confirm the ticket* ***4.****ticket issued to the user*	
Alternative and exceptional flows: ***4.1:****particular train not available*	
Post-conditions: ▪user booked the ticket	

4.2.2. [Make Payment]

Use Case Description	
Use Case name:	make payment
Use Case Description:*user pay for confirm ticket*	
Primary actor:*public user*	***Other actors:****admin*
Stakeholders:	user/passenger
Relationships ▪ ***Includes:****include from choose train* ▪ ***Extends:***	
Pre-conditions: must be enter all the required detail	
Flow of Events: ***1.*** *user lenter the detail* *2. user choose a train* ***3.****user make the payment* ***4.****payment confirmed to the user*	
Alternative and exceptional flows: ***4.1:****payment method not crash*	
Post-conditions: ▪payment confirmed by admin.	

4.2.3. [cancel ticket]

Use Case Description	
Use Case name:	cancel ticket
Use Case Description:*user request for cancel ticket*	
Primary actor:*public user*	***Other actors:****admin*
Stakeholders:	user/passenger
Relationships ▪ ***Includes:*** ▪ ***Extends:****extend from ticket information*	
Pre-conditions: ticket must be generated once	
Flow of Events: ***1.****user request for cancelation* *2. Admin cancel the ticket* ***3.*** ***4.***	
Alternative and exceptional flows: ***4.1:****none*	
Post-conditions: ▪cancellation confirmed by admin.	

4.2.4. [Booking History]

Use Case Description	
Use Case name:	booking history
Use Case Description:*user sees all the previous history of booking train*	
Primary actor:*public user*	***Other actors:***
Stakeholders:	user/passenger
Relationships ▪ ***Includes:*** ▪ ***Extends:****extend from ticket information*	
Pre-conditions: booking must be done at least once	
Flow of Events: ***1.****user clicks the booking history* *2.system shows the history* ***3.*** ***4.***	
Alternative and exceptional flows: ***4.1:****none*	
Post-conditions: ▪system shows the history of booking	

5. Non-functional Requirements

5.1. Performance Requirements

- **User Satisfaction*:*** The system will stand up to the expectations of the user.
- **Error Management*:*** Responses to errors have been given so that the system doesn't lag behind in the case of an error.
- **User Friendly:** The system is easy to use having a very friendly GUI.
- **Response Time:** The system has optimal response time to all types of queries through some efficient programming.
- **Robustness*:*** The system is robust as it protects your safety and safeguards against unwanted events.

5.2. Safety Requirements

File may get deleted or crashed due to viruses in the system or operating system requirement.Therefore,the recovery method "Backup file" is required to save all the data in any uncertain cases.

5.3. Security Requirements

The system uses login signup with an authentic account so that no third user can access it making the data confidential and secure. Moreover, if credit card payments are made then they are also done through secure methods to avoid the risk of any loss. Moreover, passwords are also kept secured to remove the possibility of them falling in the wrong hands.

5.4. User Documentation

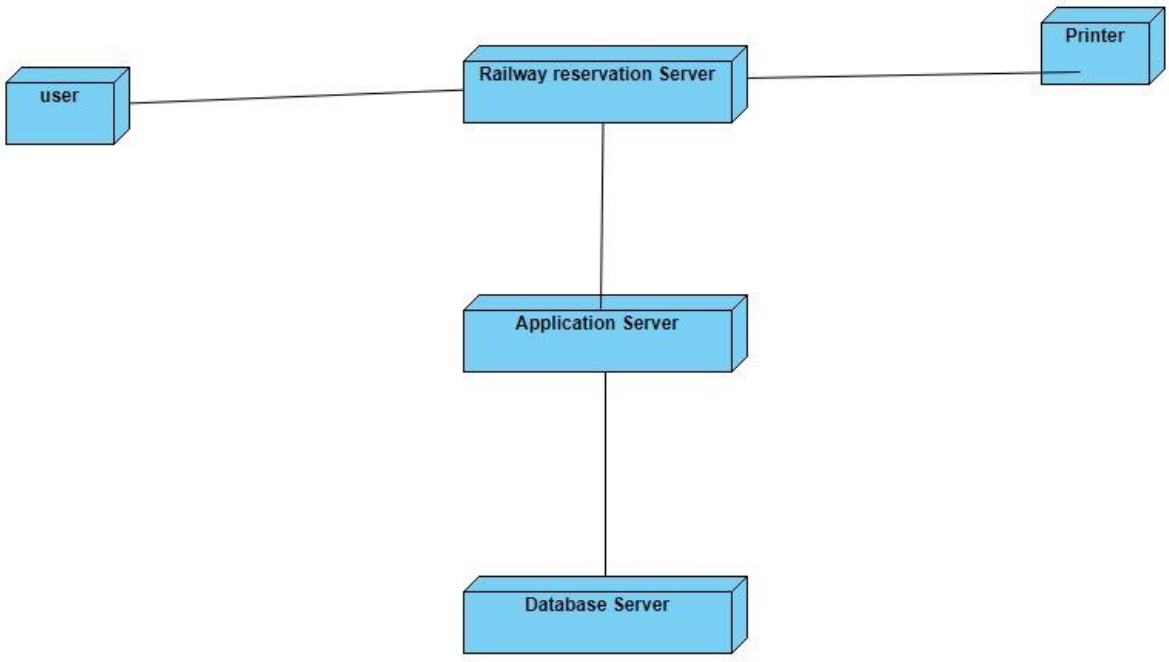
user manual
online help
tutorials

SDS

6. System Architecture

6.1. System Level Architecture

Deployment Diagram:



7. Design Strategy

Not Applicable

8. Detailed System Design

8.1. Database Design

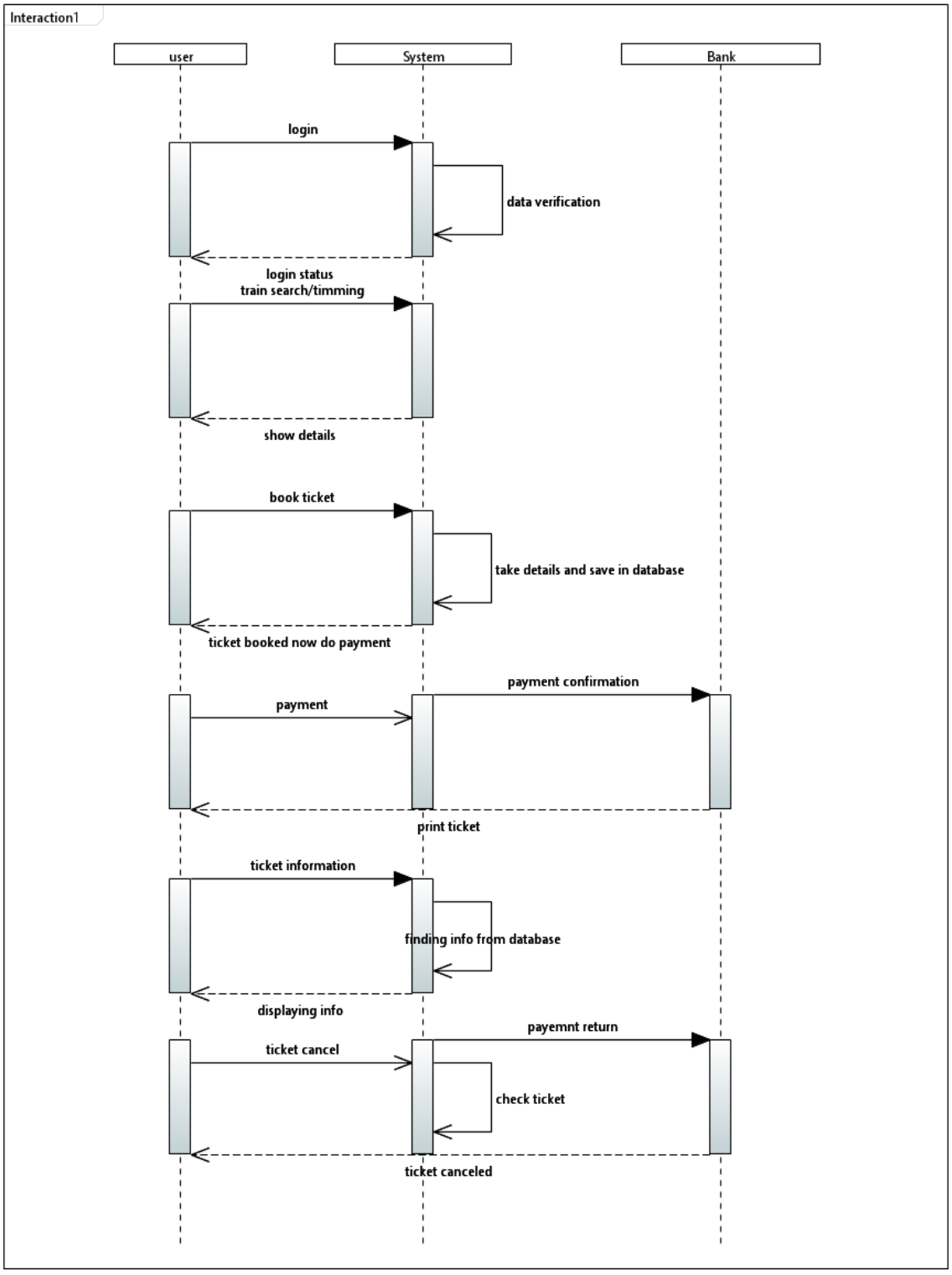
Not Applicable

ER Diagram

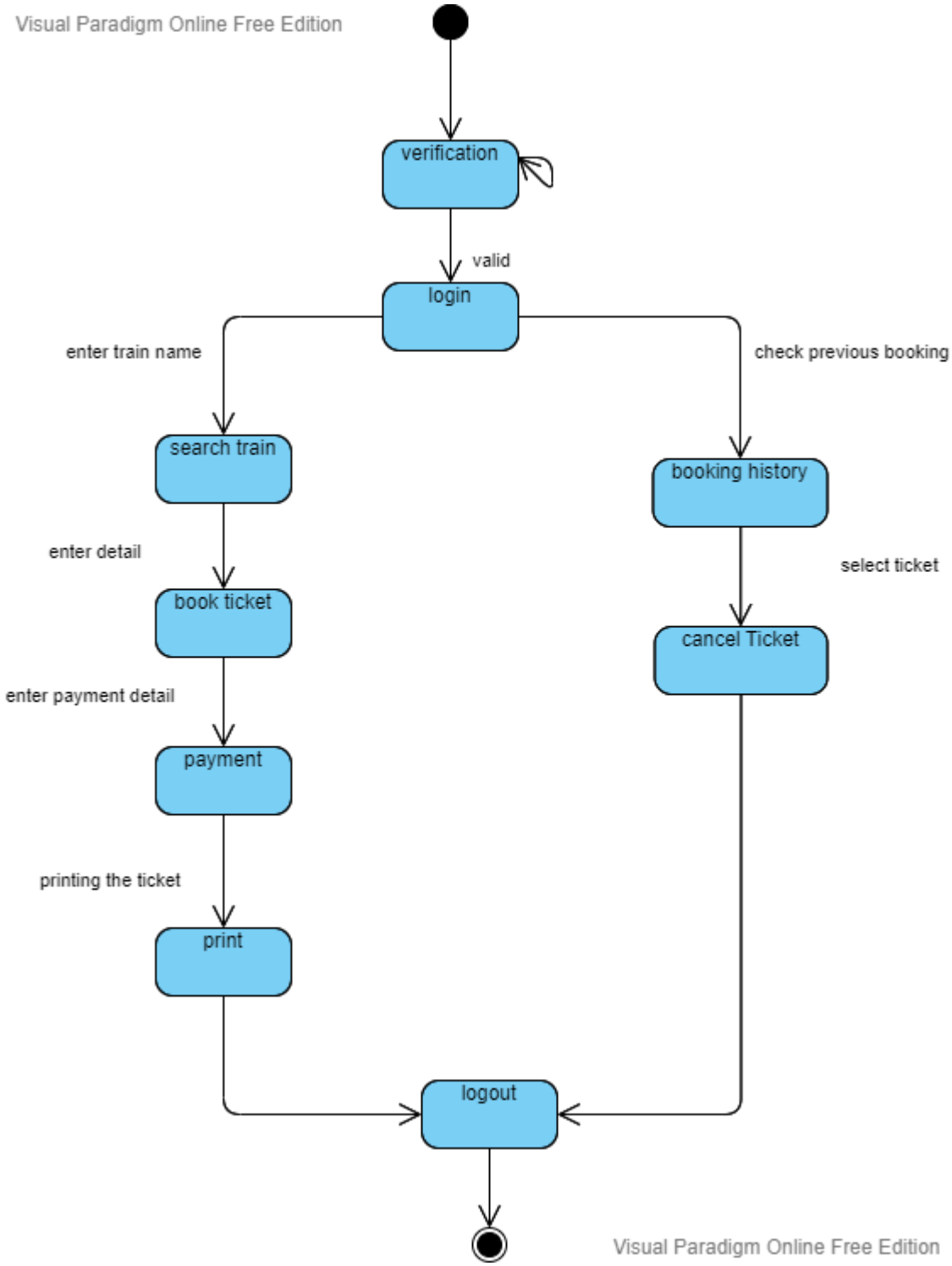
Not Applicable

8.2. Application Design

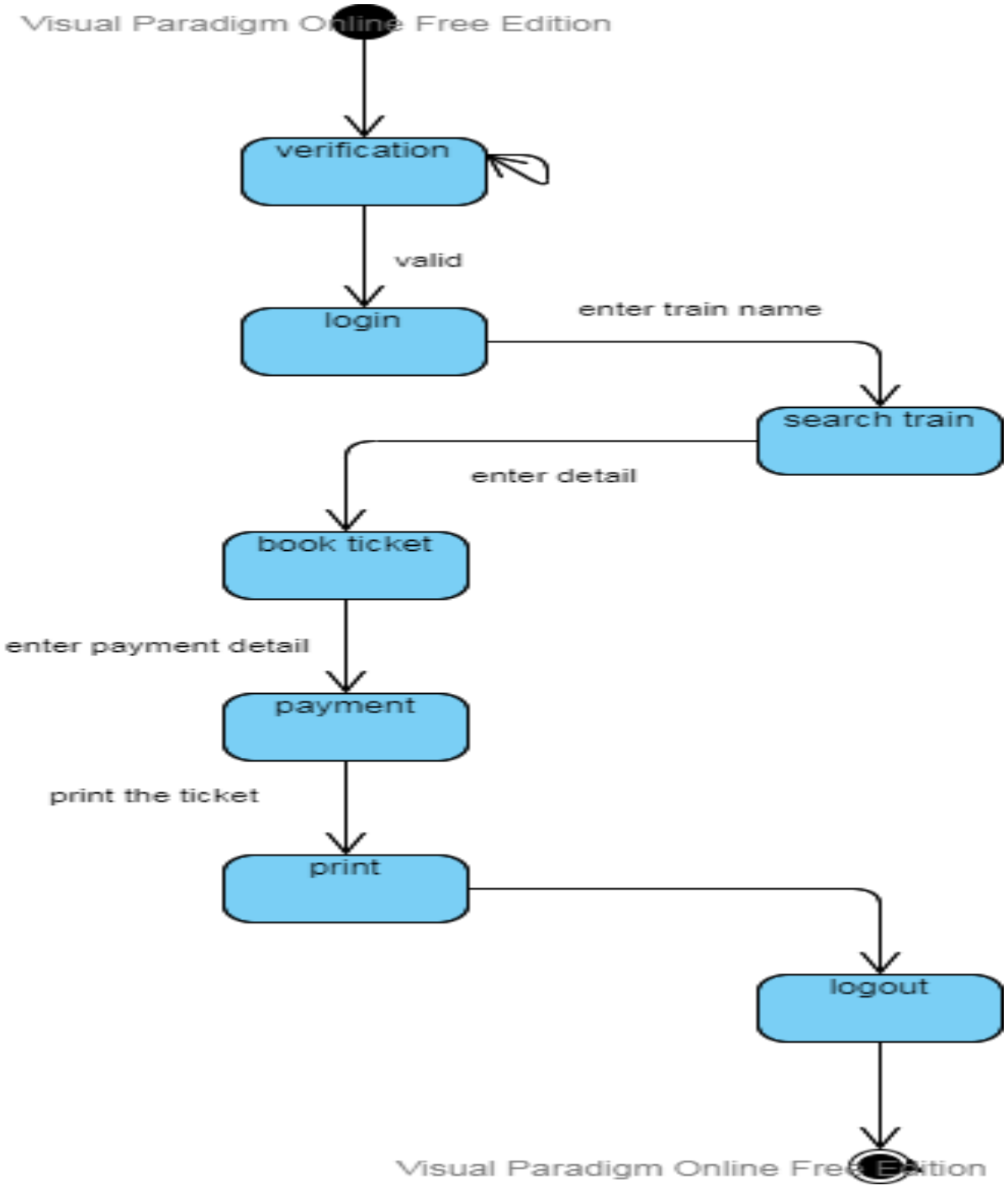
8.2.1 Sequence Diagram



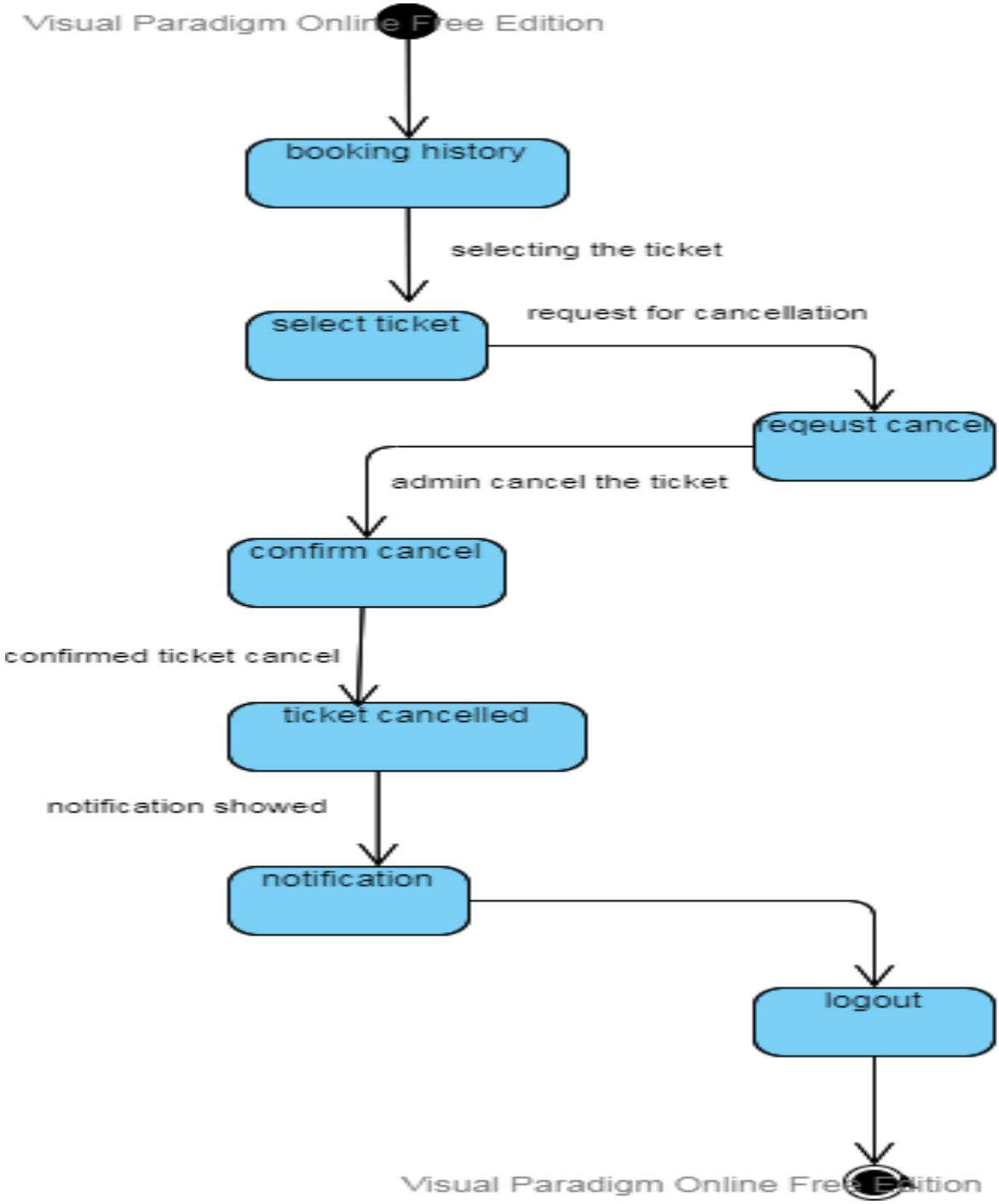
8.2.2 StateDiagram



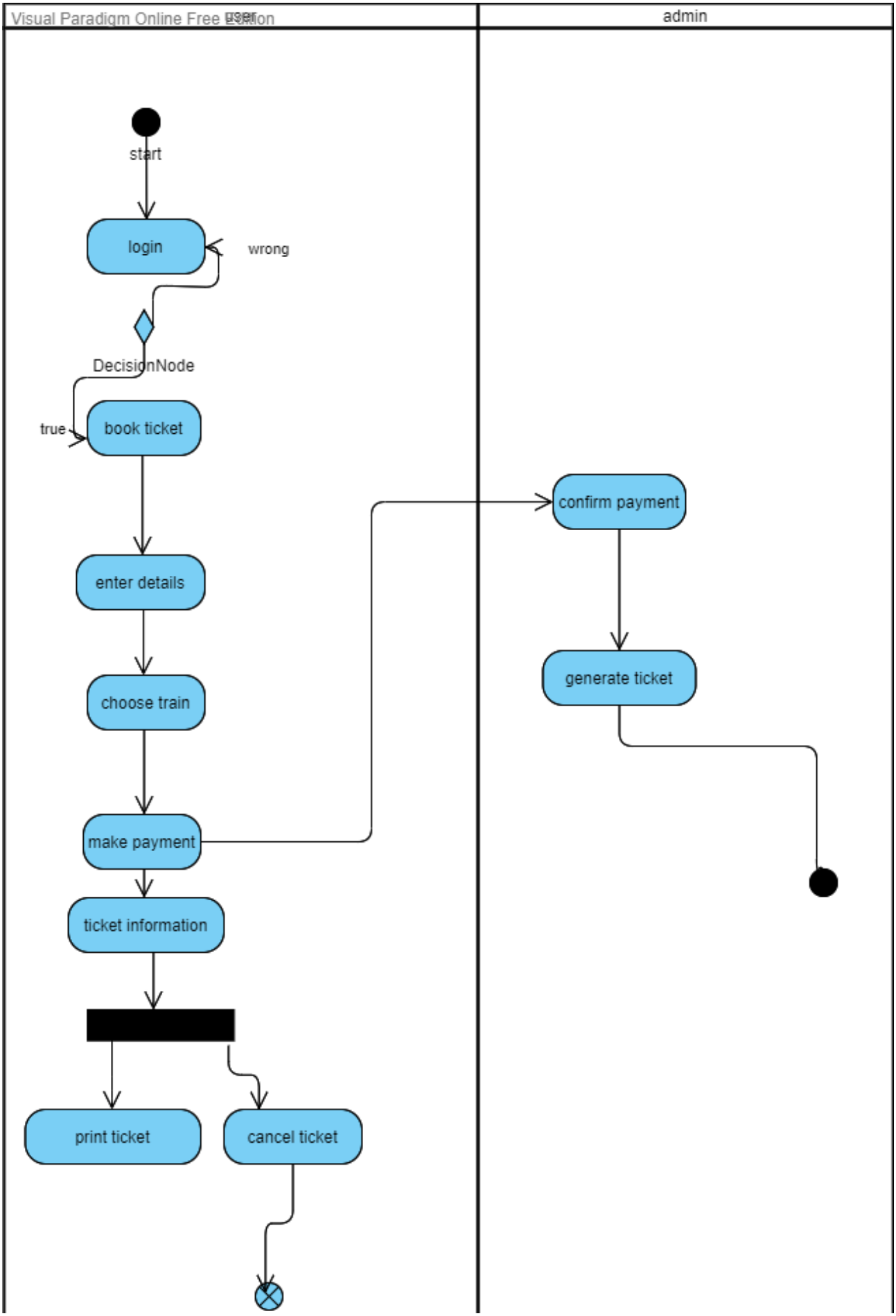
8.2.2.1
Book Ticket
State Diagram



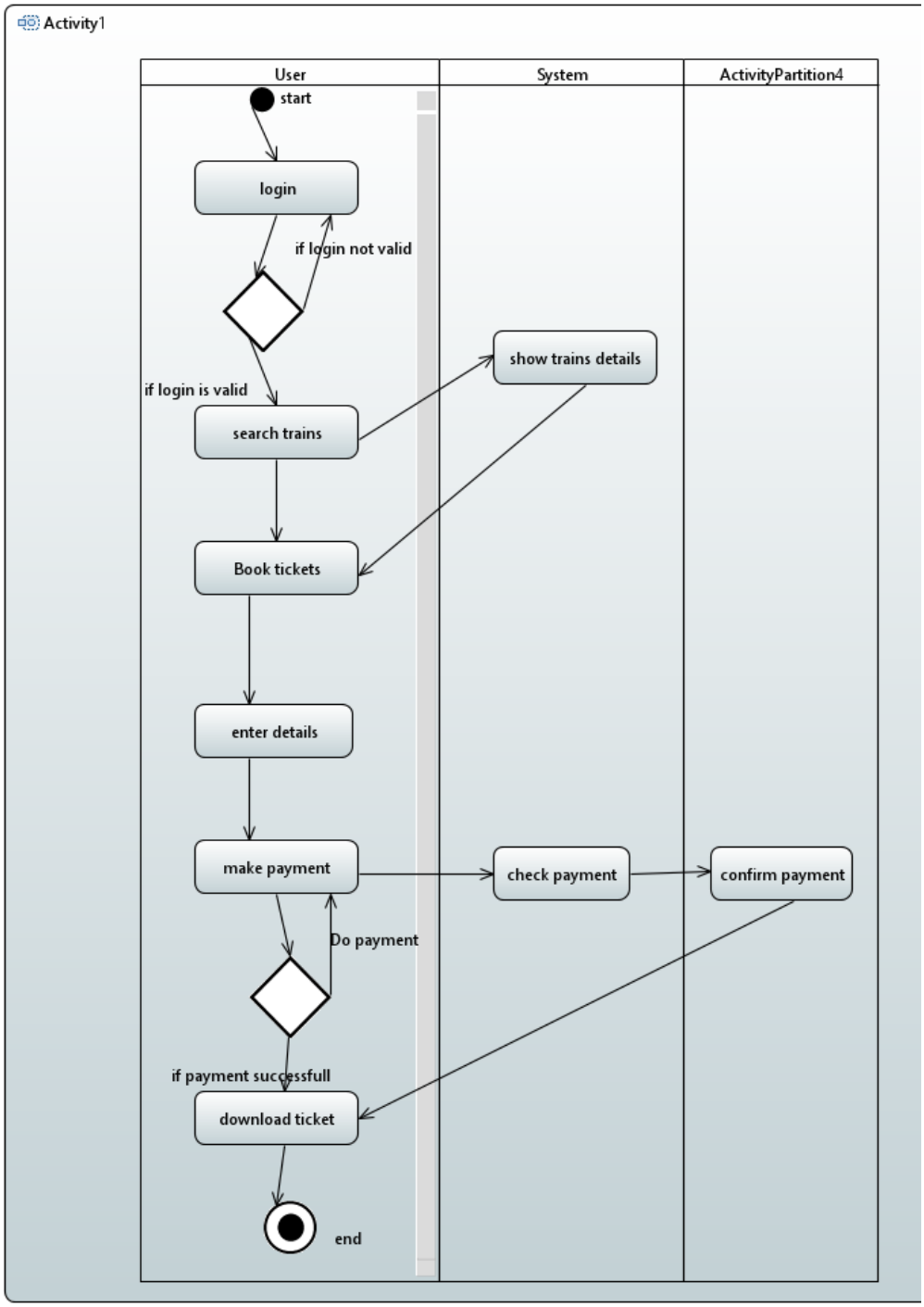
8.2.2.2
Cancel Ticket
State Diagram



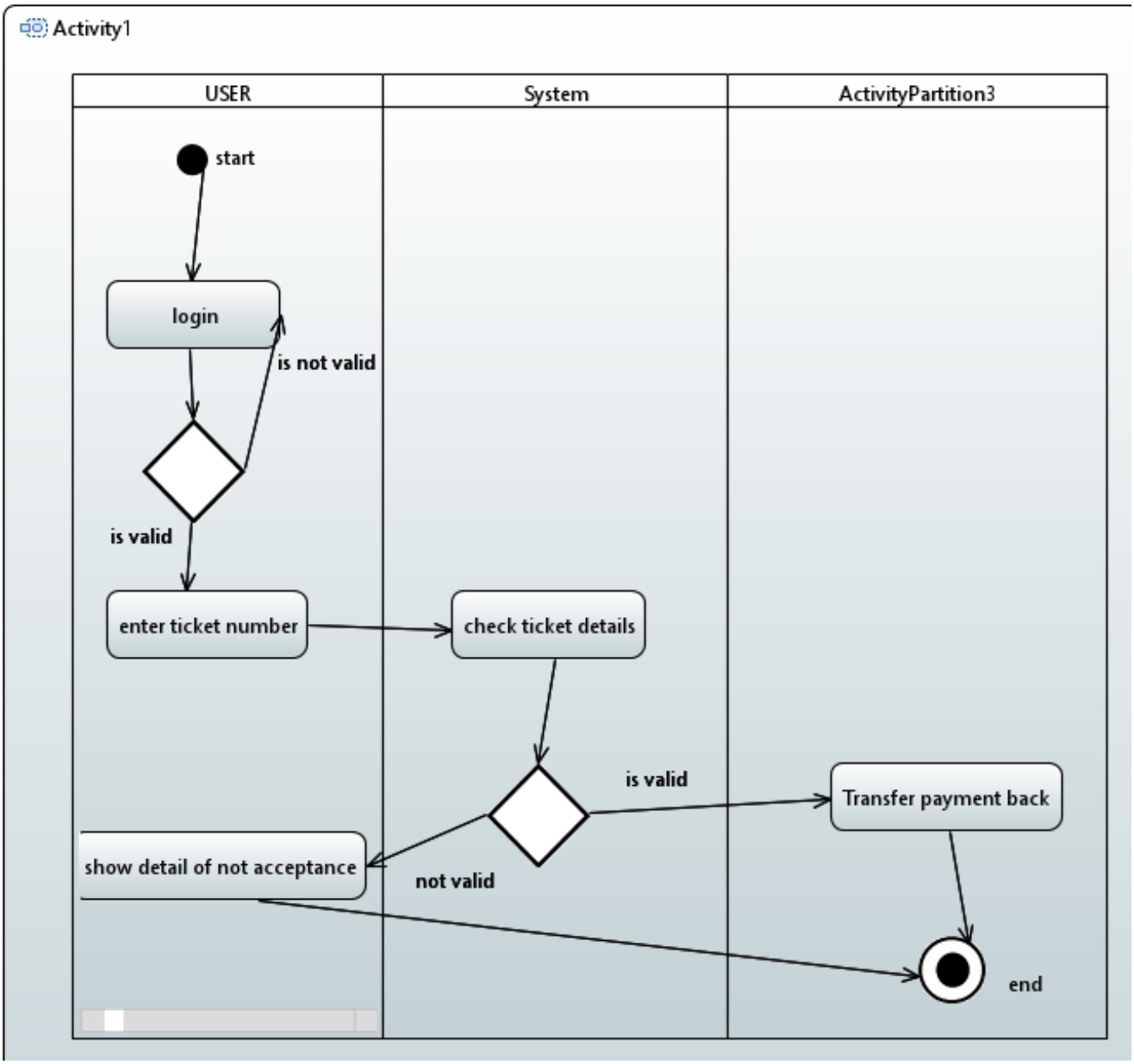
8.2.3 Activity Diagram


Visual Paradigm Online Free Edition
user
admin
start
login
wrong
DecisionNode
true
book ticket
enter details
choose train
make payment
ticket information
print ticket
cancel ticket
confirm payment
generate ticket

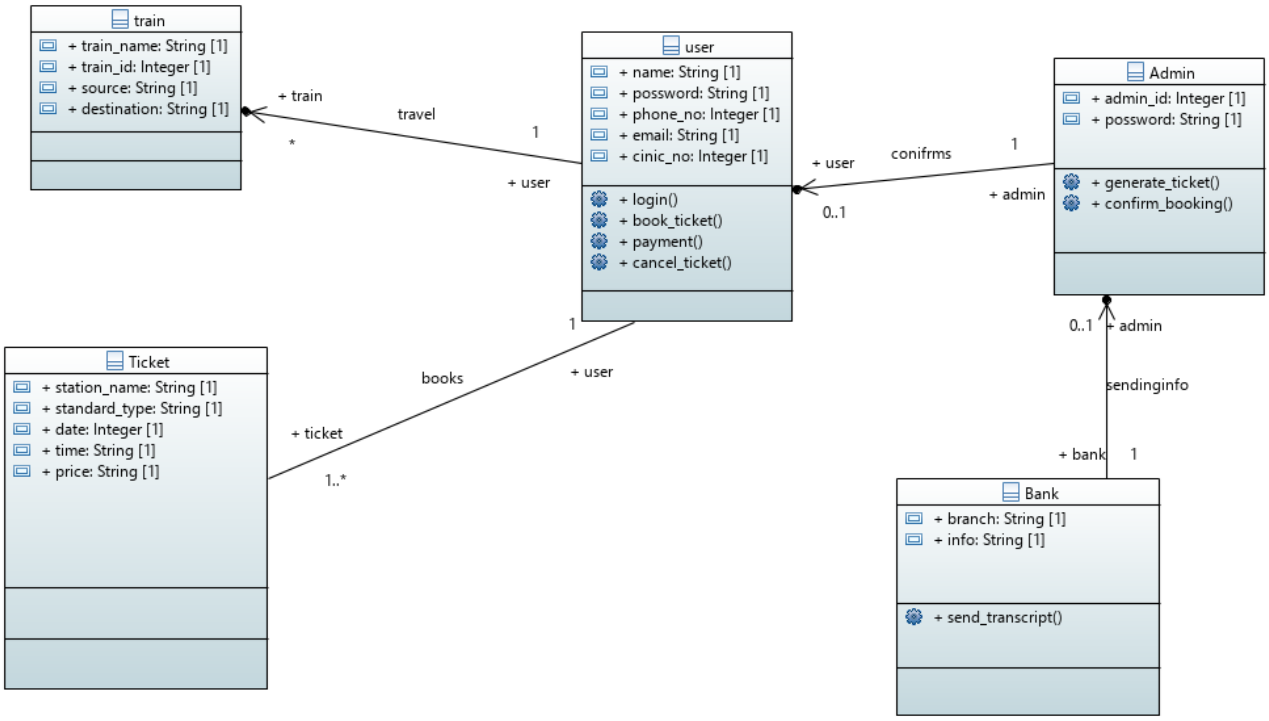
8.2.3.1
Book Ticket
Activity Diagram



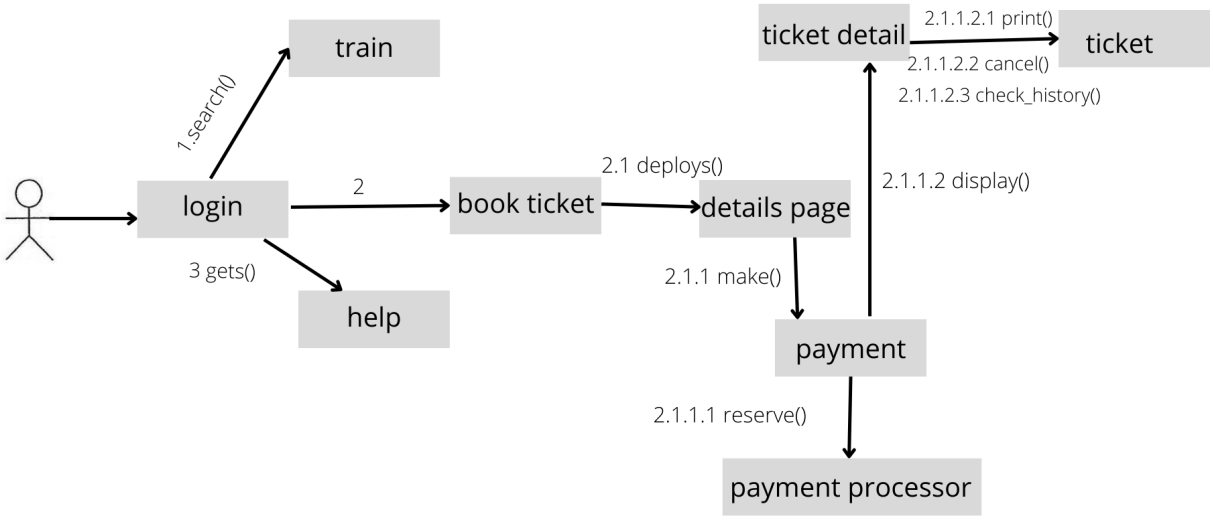
8.2.3.2
Book Ticket
Activity Diagram



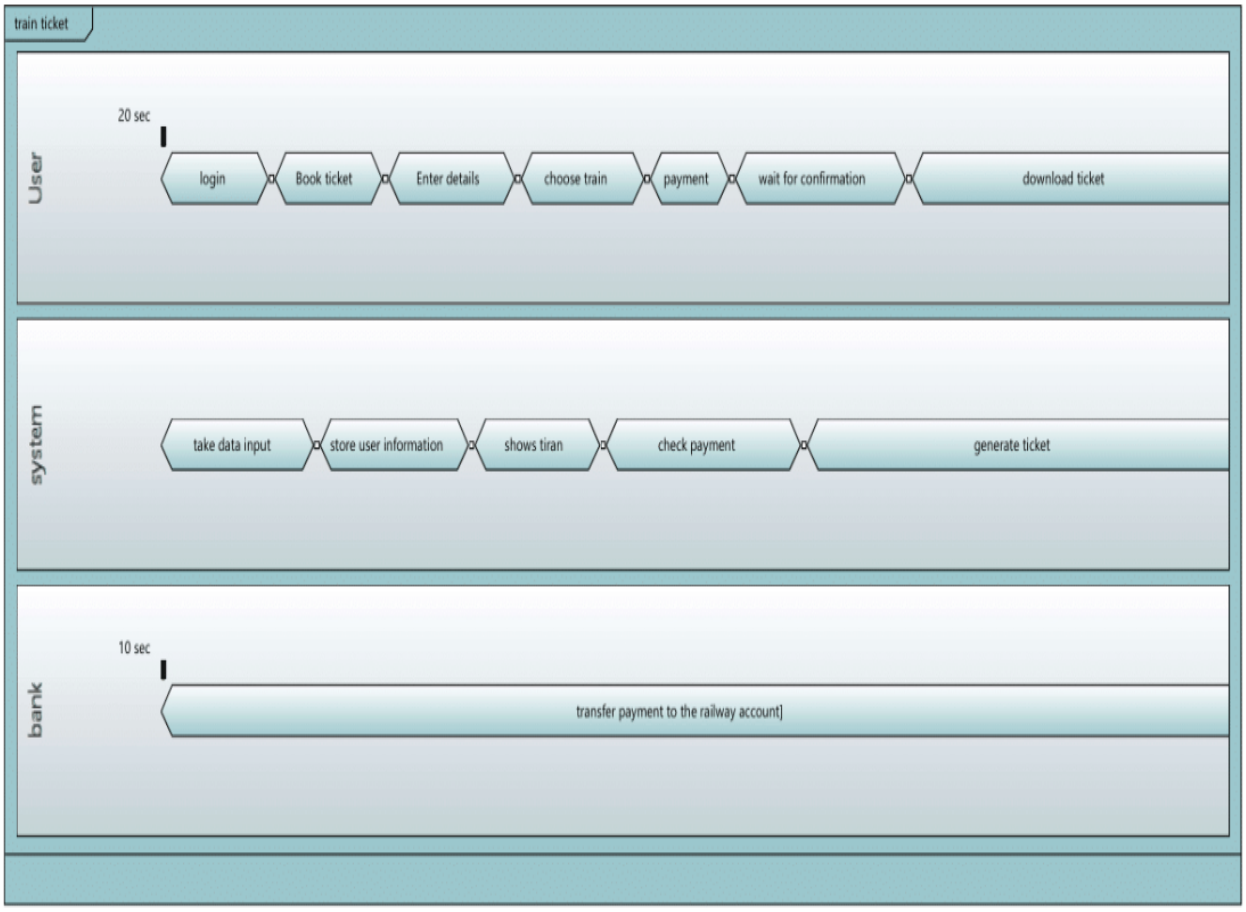
8.2.4 Class Diagram



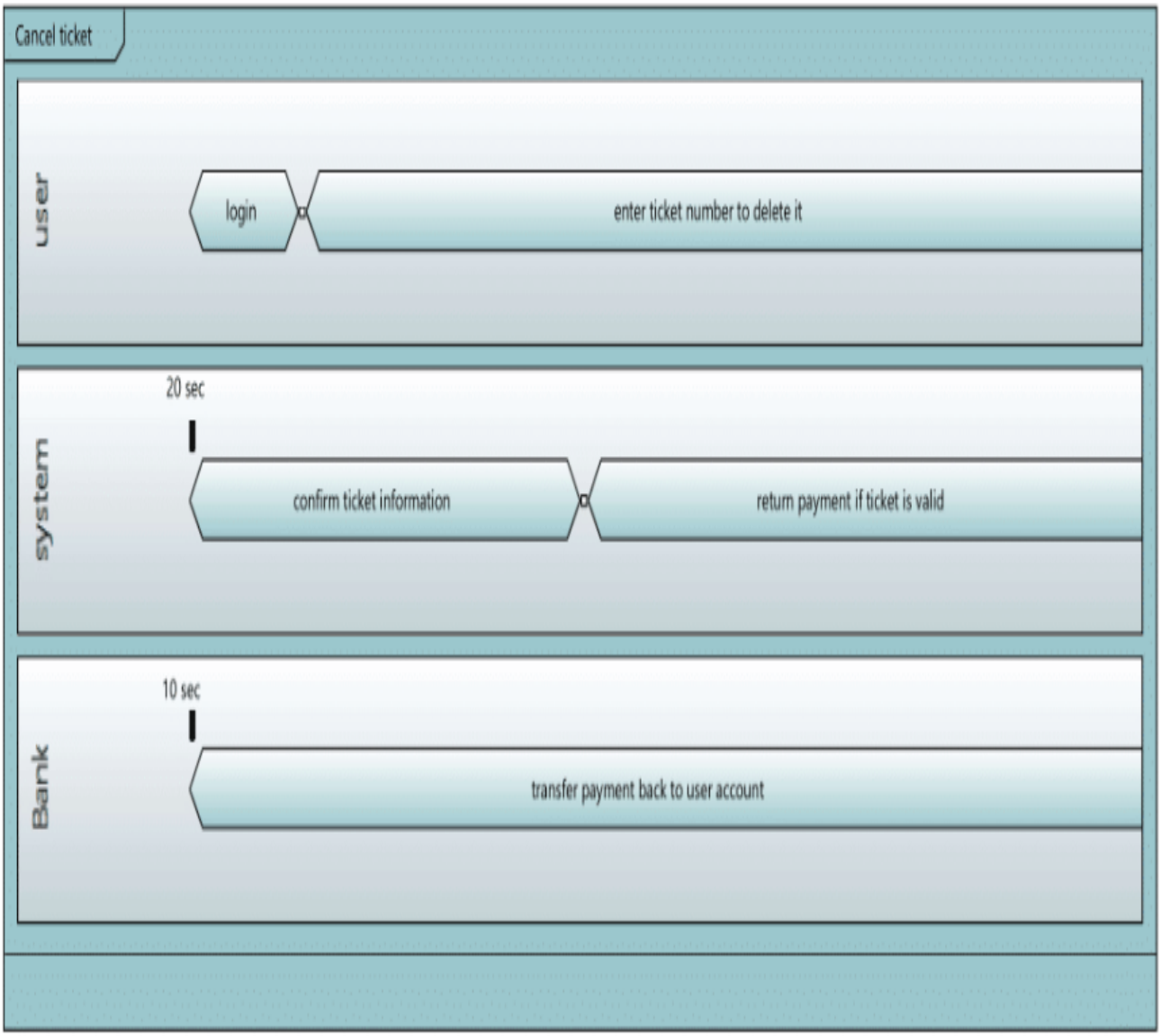
8.2.5
Collaboration-Diagram



8.2.6
Book Ticket
Timing-Diagram



8.2.6.1
Cancel Ticket
Timing-Diagram



9. References

Pakistan Railways:https://www.pakrail.gov.pk/index.aspx
Public Notices: https://www.pakrail.gov.pk/RailDocuments.aspx

10. Appendices

GUI: Graphical user interface

Pak Railways:Pakistan Railways

OS: Android Operating System,IOS,Web Browsers
