Irctc-srs compress - Assignment of CSE 320 , lovely professional University

Software Engineering (Lovely Professional University)

SRS

IRCTC

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1. INTRODUCTION

ABOUT IRCTC

Indian Railway Catering and Tourism Corporation (IRCTC) is a subsidiary of the Indian Railways that handles the catering, tourism and online ticketing operations of the Indian railways, with around 5,50,000 to 6,00,000 bookings every day is the world's second busiest and highest of 15 to 16 lakh tickets every day. Its tagline is "Lifeline of the nation".

A. INTRODUCTION

As from the above introduction we can see that the total number of bookings everyday are more than normal values. Even the passengers have to reserve the tickets for the long train routes 3-4 months prior to their travel to the specific place. And sometimes the train which they are willing to reserve is completely reserved earlier and the passenger might have to make changes to the travelling plans. So, there is a need of computer based or mobile based approach like **"Railways Reservation System"** to prevent this from happening, from where the user can easily book the train before time and can easily travel on time without any problem. User can also cancel the reservation if there is a change in plan or if something happens. Users can easily pay the bill amount through secure online payment gateways. And this approach can resolve the hustle situations in railway stations, passengers will be there on the

specific time when the train is going to arrive by checking the train status on mobile or desktop application.

B. PURPOSE/OBJECTIVE

The **IRCTC** software is developed for the ease of the passengers who use to travel by the means of Indian Railways. This software is to be deployed in the whole country and it is more like "Railways reservation system". The software is useful in many ways like:

- ✓ To check train timing
- ✓ To check PNR status
- ✓ Easy and manual approach
- ✓ Reservation
- ✓ Passengers do not have to wait in long queues for tickets
- ✓ Easy payment through secure online gateways
- ✓ Billing and cancellation on various types of reservations namely:
    - Tatkal reservation
    - Online reservation
    - Confirmation of reservation for confirmed seats
    - Waiting list reservation
    - Reservation against cancellation

C. SCOPE

"Railways Reservation System" is an attempt to simulate the basic concepts of an online Reservation system. The system is based on a relational database with its railway management and reservation functions. We will have a database server supporting all the cities around the country as well as a lot of train routes by IRCTC. Above

all, we hope to provide a comfortable user experience along with the reasonable pricing. The system enables to perform the following functions:

✓ Search for train
✓ Booking of a selected train
✓ Payment
✓ Cancellation
✓ Catering facility
✓ Improved & optimized service

D. GLOSSARY

This should define all technical terms and abbreviations used in the document.

- NTES: – National Train Enquiry System
- IVRS: – Interactive Voice Response system
- PRS: – passenger reservation system
- DFD: - Data Flow Diagram
- ERD: - Entity Relationship Diagram
- SRS: - Software Requirements Specification
- STD: - State Transition Diagram

E. OVERVIEW

The remaining sections of this document provide a general description, including characteristics of the users of this project, the product's hardware, and the functional and data requirements of the product. General description of the project is discussed in section 2 of this document. Section 3 gives the functional

requirements, data requirements and constraints and assumptions made while designing the E-Booking system. It also gives the user viewpoint of product. Section 3 also gives the specific requirements of the product. Section 3 also discusses the external interface requirements and gives detailed description of functional requirements. Section 4 is for supporting information.

2. OVERALL DESCRIPTION

This document contains the problem statement that the current system is facing which is hampering the growth opportunities of the company. It further contains a list of the stakeholders and users of the proposed solution. It also illustrates the needs and wants of the stakeholders that were identified in the brainstorming exercise as part of the requirements workshop. It further lists and briefly describes the major features and a brief description of each of the proposed system.

A. PRODUCT PERSPECTIVE

Before the automation, the system suffered from the following drawbacks:

- The existing system is highly manual involving a lot of paperwork and calculation and therefore may be erroneous. This has led to inconsistency and inaccuracy in the maintenance of data.
- The data, which is stored on the paper only, may be lost, stolen or destroyed due to natural calamity like fire and water.

- The existing system is sluggish and consumes a lot of time causing inconvenience to customers and the airlines staff.
- Due to manual nature, it is difficult to update, delete, add or view the data.
- Since the number of passengers have drastically increased therefore maintaining and retrieving detailed record of passenger is extremely difficult.
- A railway has many offices around the world, an absence of a link between these offices lead to lack of coordination and communication.
- Hence the railways reservation system is proposed with the following
- The computerization of the reservation system will reduce a lot of paperwork and hence the load on the airline administrative staff.
- The machine performs all calculations. Hence chances of error are nil.
- The passenger, reservation, cancellation list can easily be retrieved and any required addition, deletion or updation can be performed.
- The system provides for user-ID validation, hence unauthorized access is prevented.

B. PROJECT FUNCTIONS

Booking agents with varying levels of familiarity with computers will mostly use this system. An important feature of this software is that it be relatively simple to use. The scope of this project encompasses:

- Search: This function allows the booking agent to search for train that are available between the two travel cities, namely the "Departure city" and "Arrival city" as desired by the traveller. The system initially prompts the agent for the departure and arrival city, the date of departure, preferred time slot and the number of passengers. It then displays a list of train available with different airlines between the designated cities on the specified date and time.
- Selection: This function allows a train to be selected from the displayed list. All the details of the train are shown: -
    - Train Number
    - Date, time and place of departure
    - Date, time and place of arrival
    - TRAIN Duration
    - Fare per head
    - Number of stoppages – 0, 1, 2…
- Review: If the seats are available, then the software prompts for the booking of train. The train information is shown. The total fare including taxes is shown and flight details are reviewed.
- Traveller Information: It asks for the details of all the passengers supposed to travel including name, address, telephone number and e-mail id.
- Payment: It asks the agent to enter the various credit card details of the person making the reservation.
    - Credit card type
    - Credit card number
    - CVC number of the card
    - Expiration date of the card

  - The name on the card
- Cancellation: The system also allows the passenger to cancel an existing reservation. This function registers the information regarding a passenger who has requested for a cancellation of his/her ticket. It includes entries pertaining to the train No., Confirmation No., Name, Date of Journey, Fare deducted.

C. USER CHARACTERISTICS

- Educational level: - At least user of the system should be comfortable with English language.
- Technical expertise: - User should be comfortable using general purpose applications on the computer system.

D. CONSTRAINTS

The system will run under windows 7 or higher platforms of operating system.

E. ASSUMPTIONS AND DEPENDENCIES

- Booking Agents will be having a valid username and password to access the software
- The software needs booking agent to have complete knowledge of railways reservation system.
- Software is dependent on access to internet.

3. REQUIREMENTS

A. FUNCTIONAL REQUIREMENTS

I. PERFORMANCE REQUIREMENTS

- User Satisfaction: - The system is such that it stands up to the user expectations.
- Response Time: -The response of all the operation is good. This has been made possible by careful programming.
- Error Handling: - Response to user errors and undesired situations has been taken care of to ensure that the system operates without halting.
- Safety and Robustness: - The system can avoid or tackle disastrous action. In other words, it should be foul proof. The system safeguards against undesired events, without human intervention.
- Portable: - The software should not be architecture specific. It should be easily transferable to other platforms if needed. User friendliness: - The system is easy to learn and understand. A native user can also use the system effectively, without any difficulties.

II. DESIGN CONSTRAINTS

There are several factors in the client's environment that may restrict the choices of a designer. Such factors include standards that must be followed, resource limits, operating environment,

reliability and security requirements and policies that may have an impact on the design of the system. An SRS (Software Requirements Analysis and Specification) should identify and specify all such constraints.

- Standard Compliance: - This specifies the requirements for the standards the system must follow. The standards may include the report format and accounting properties.
- Hardware Limitations: - The software may have to operate on some existing or predetermined hardware, thus imposing restrictions on the design. Hardware limitations can include the types of machines to be used, operating system available on the system, languages supported and limits on primary and secondary storage.
- Reliability and Fault Tolerance: - Fault tolerance requirements can place a major constraint on how the system is to be designed. Fault tolerance requirements often make the system more complex and expensive. Requirements about system behaviour in the face of certain kinds of faults are specified. Recovery requirements are often an integral part here, detailing what the system should do I some failure occurs to ensure certain properties. Reliability requirements are very important for critical applications.
- Security: - Security requirements are particularly significant in defence systems and database systems. They place restrictions on the use of certain commands, control access to data, provide different kinds of access requirements for different people,

require the use of passwords and cryptography techniques and maintain a log of activities in the system.

III. HARDWARE REQUIREMENTS

For the hardware requirements the SRS specifies the logical characteristics of each interface b/w the software product and the hardware components. It specifies the hardware requirements like memory restrictions, cache size, the processor, RAM size etc... those are required for the software to run.

- Minimum Hardware Requirements
- Processor Pentium III
- Hard disk drive 40 GB
- RAM 128 MB
- Cache 512 kb
- Preferred Hardware Requirements
- Processor Pentium IV
- Hard disk drive 80 GB
- RAM 256 MB
- Cache 512 kb

IV. SOFTWARE REQUIREMENTS

Any window-based or MAC operating system with DOS support are primary requirements for software development. Windows XP, FrontPage and dumps are required. The systems must be connected via LAN and connection to internet is mandatory.

V. OTHER REQUIREMENTS

- Software should satisfy following requirements as well: -
- SECURITY
- PORTABILITY
- CORRECTNESS
- EFFICIENCY
- FLEXIBILTY
- TESTABILTY
- REUSABILTY

B. NON-FUNCTIONAL REQUIREMENTS

I. SECURITY

The system uses SSL (secured socket layer) in all transactions that include any confidential customer information. The system must automatically log out all customers after a period of inactivity. The system should not leave any cookies on the customer's computer containing the user's password. The system's back-end servers shall only be accessible to authenticated management.

II. RELIABILITY

The reliability of the overall project depends on the reliability of the separate components. The main pillar of reliability of the system is the backup of the database which is continuously maintained and updated to reflect the most recent changes. Also, the system will be functioning inside a container. Thus, the overall stability of the system depends on the stability of container and its underlying operating system.

III. AVAILABILITY

The system should always be available, meaning the user can access it using a web browser, only restricted by the down time of the server on which the system runs. A customer friendly system which is in access of people around the India should work 24 hours. In case of a of a hardware failure or database corruption, a replacement page will be shown. Also, in case of a hardware failure or database corruption, backups of the database should be retrieved from the server and saved by the Organizer. Then the service will be restarted. It means 24 x 7 availability.

IV. MAINTAINABILITY

A commercial database is used for maintaining the database and the application server takes care of the site. In case of a failure, a re-initialization of the project will be done. Also, the software design is being done with modularity in mind so that maintainability can be done efficiently.

V. SUPPORTABILITY

The code and supporting modules of the system will be well documented and easy to understand. Online User Documentation and Help System Requirements.

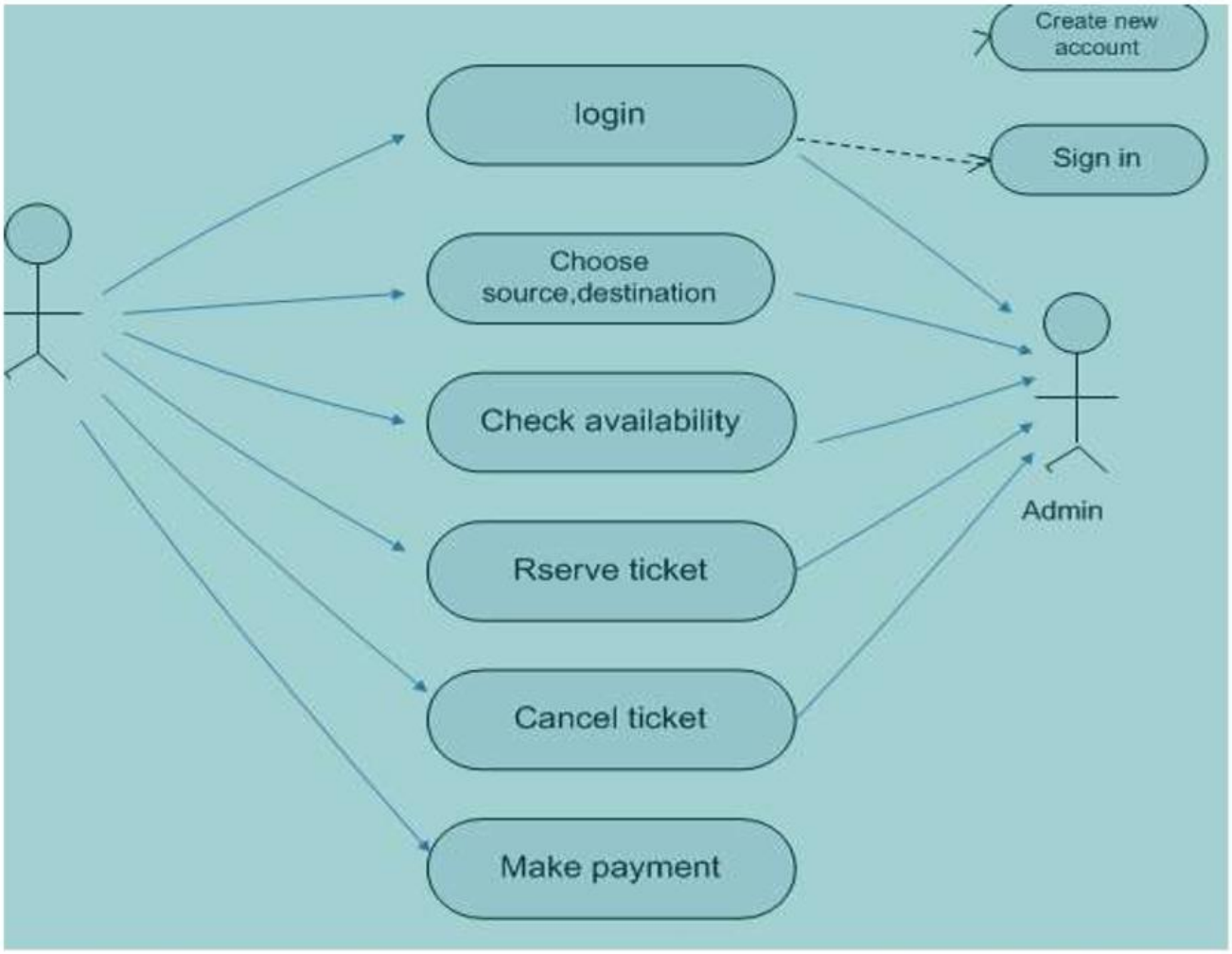
4. DIAGRAMS

A use case diagram in the Unified Modelling Language (UML) is a type of behavioural diagram defined by and created from a Use-case analysis. Its purpose is to present a graphical overview of the functionality provided by a system in terms of actors, their goals (represented as use cases), and any dependencies between those use cases. The main purpose of a use case diagram is to show what system functions are performed for which actor. Roles of the actors in the system can be depicted. Interaction among actors is not shown on the use case diagram. If this interaction is essential to a coherent description of the desired behaviour, perhaps the system or use case boundaries should be re-examined. Alternatively, interaction among actors can be part of the assumptions used in the use case.

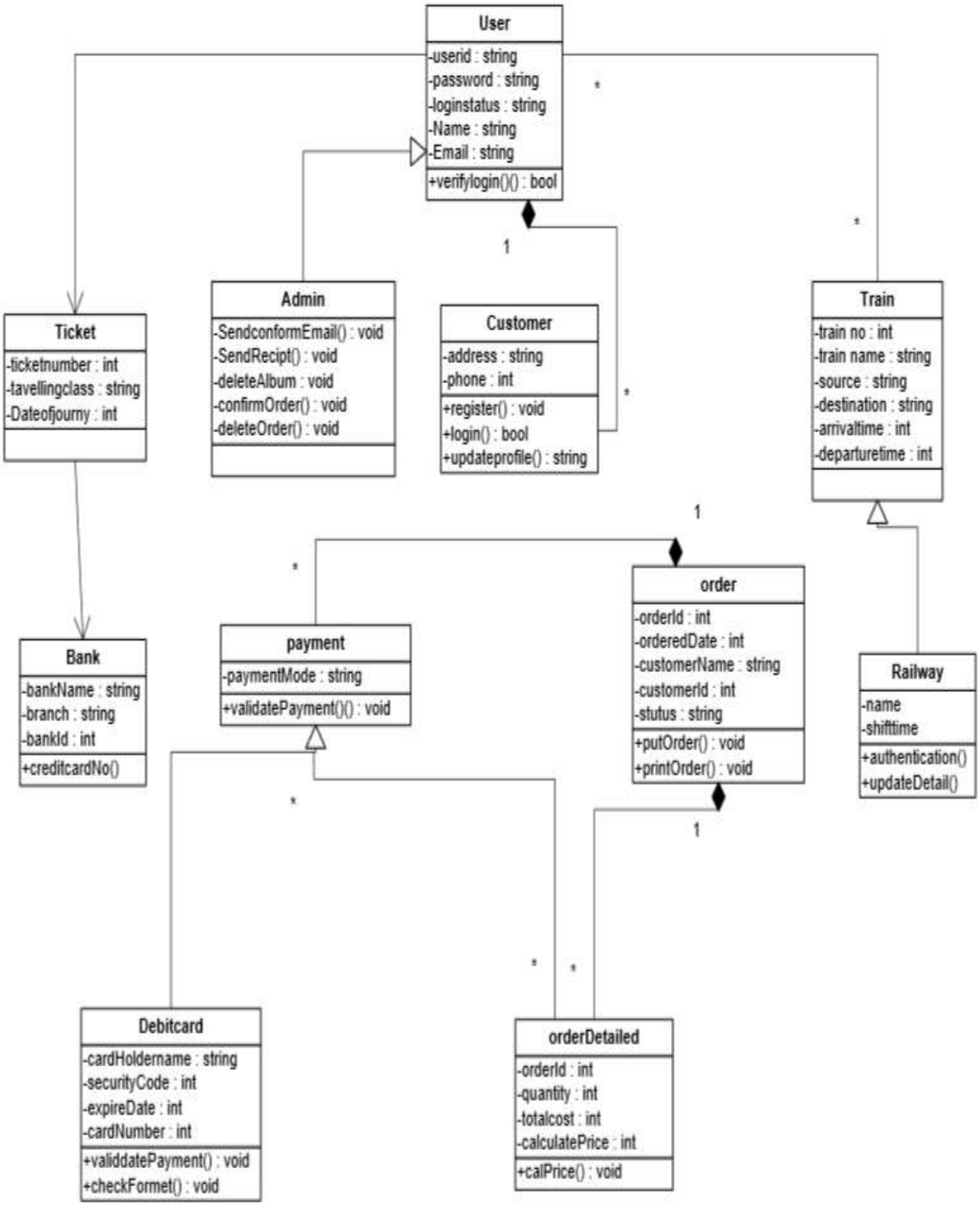
- Use cases A use case describes a sequence of actions that provide something of measurable value to an actor and is drawn as a horizontal ellipse.
- Actors An actor is a person, organization, or external system that plays a role in one or more interactions with the system.

System boundary boxes(optional) A rectangle is drawn around the use cases, called the system boundary box, to indicate its scope of system. Anything within the box represents functionality that is in scope and anything outside the box is not.

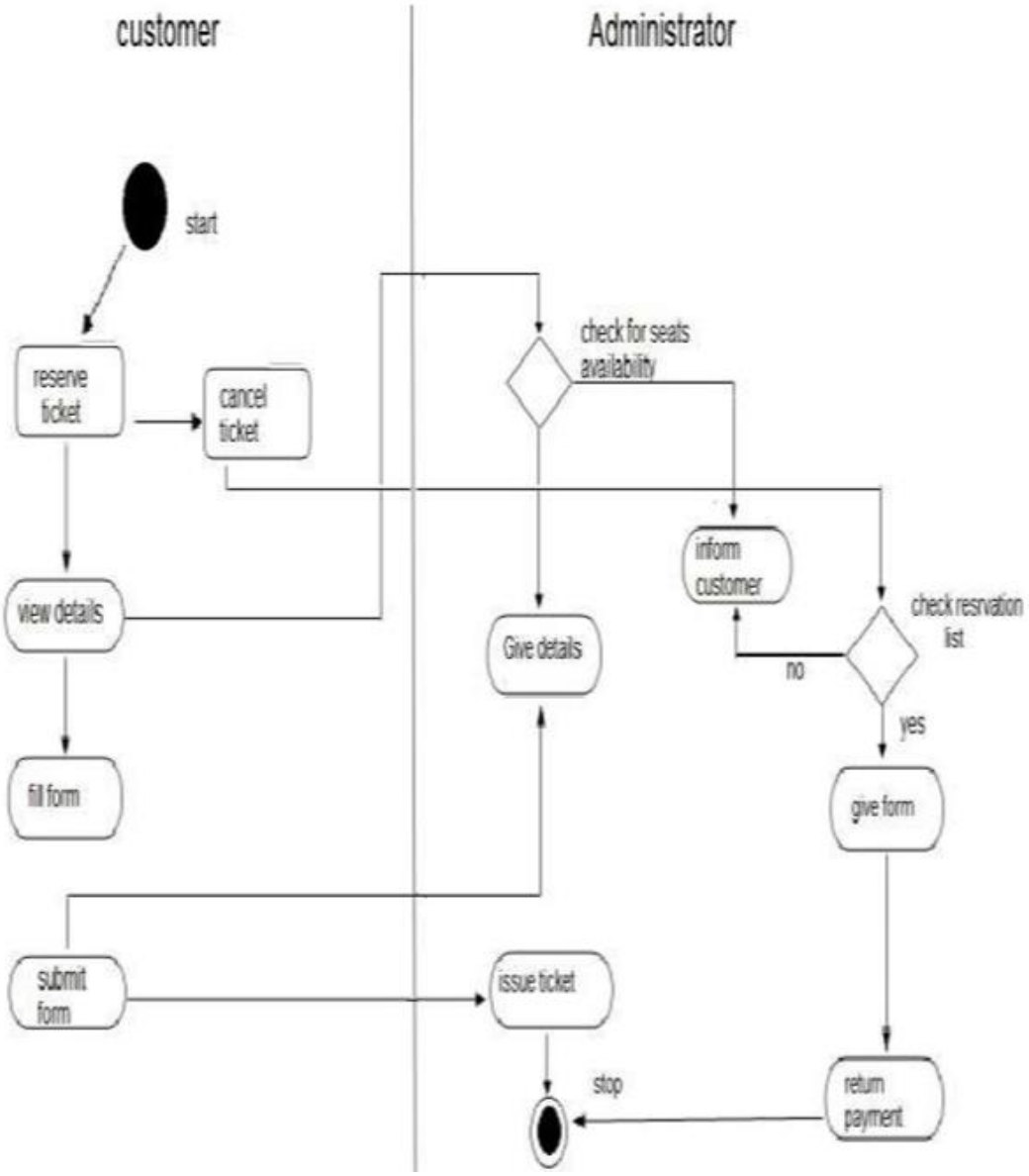
A. USE-CASE DIAGRAM



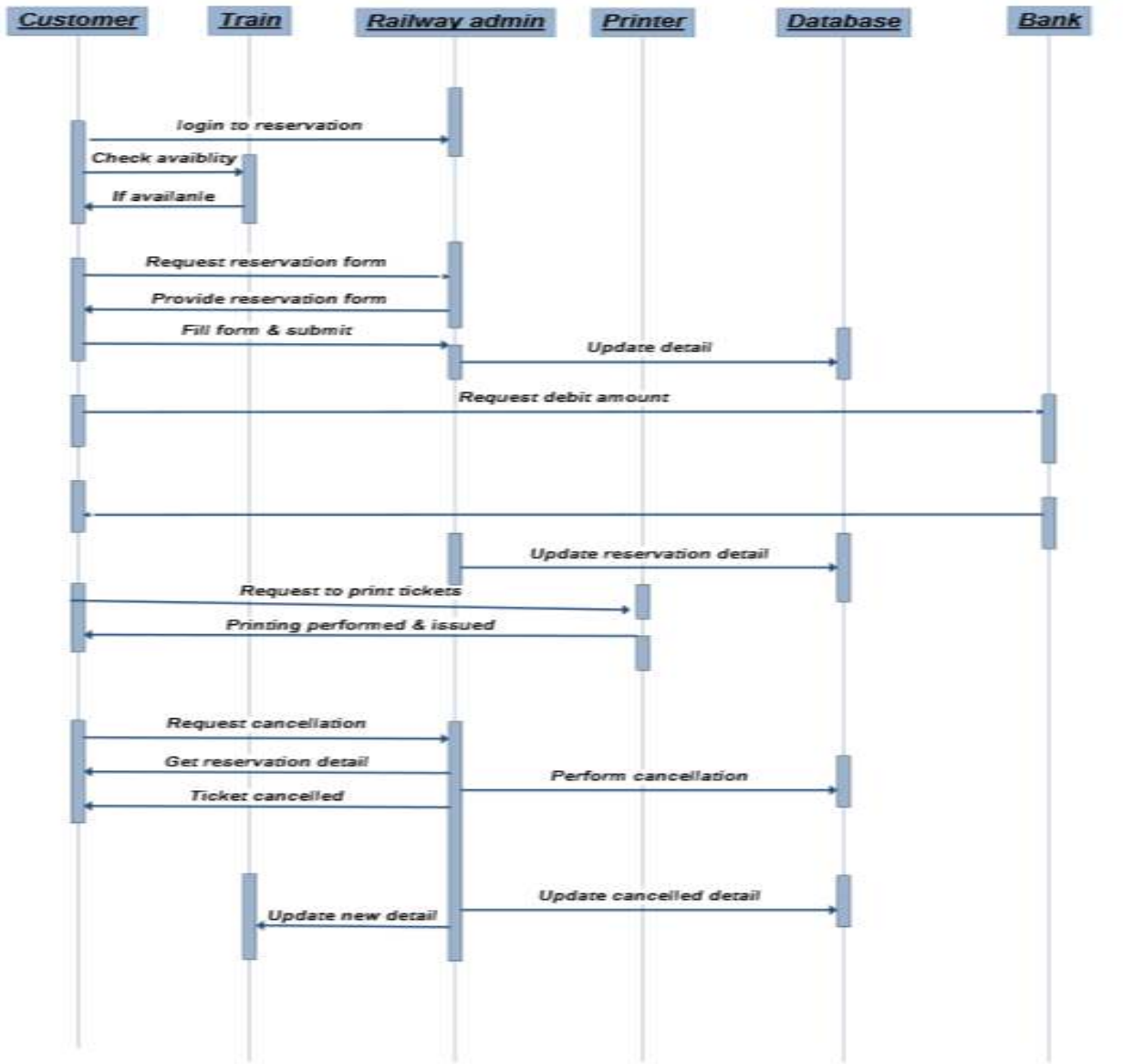
B. CLASS DIAGRAM



C. STATE DIAGRAM



D. SEQUENCE DIAGRAM



E. DATA FLOW DIAGRAM

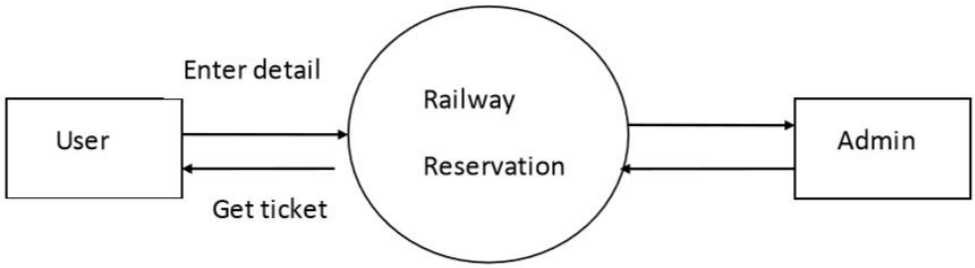
A data flow diagram (DFD) is a graphical representation of the "flow" of data through an information system. DFDs can also be used for

the visualization of data processing (structured design). On, a DFD, data items flow from an external data source or an internal data store to an internal data store or an external data sink, via an internal process. A DFD provides no information about the timing of processes, or about whether processes will operate in sequence or in parallel. It is therefore quite different from a flowchart, which shows the flow of control through an algorithm, allowing a reader to determine what operations will be performed, in what order, and under what circumstances, but not what kinds of data will be input to and output from the system, nor where the data will come from and go to, nor where the data will be stored (all of which are shown on a DFD).

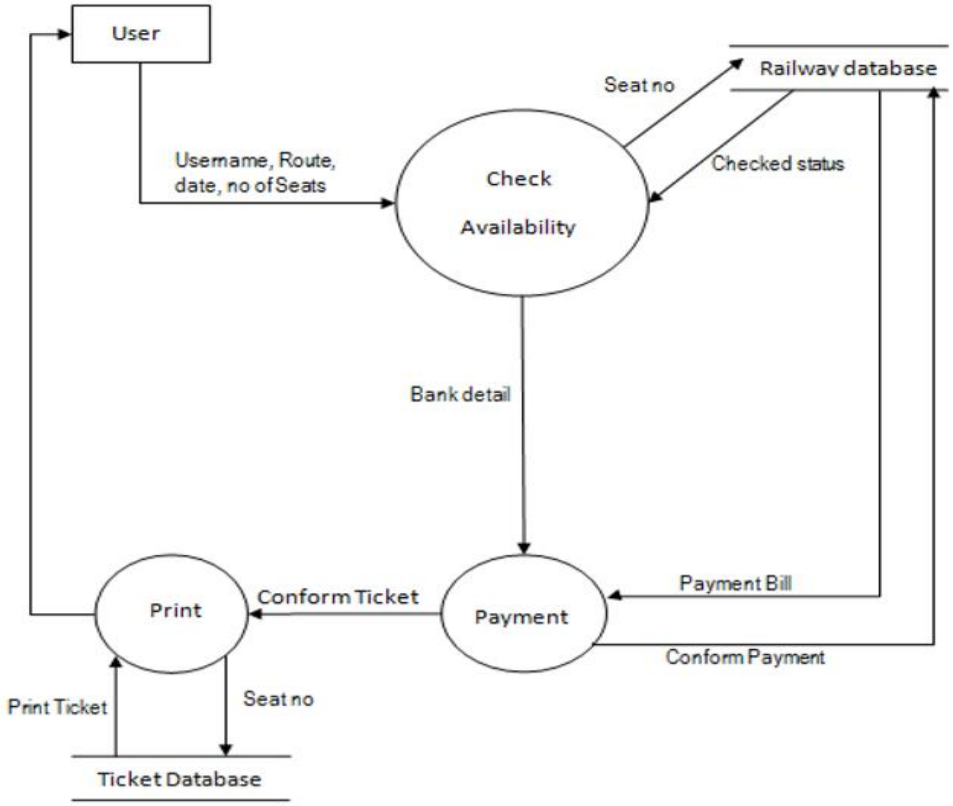
It is common practice to draw a context-level data flow diagram first, which shows the interaction between the system and external agents which act as data sources and data sinks. On the context diagram (also known as the 'Level 0 DFD') the system's interactions with the outside world are modelled purely in terms of data flows across the system boundary. The context diagram shows the entire system as a single process and gives no clues as to its internal organization.

This context-level DFD is next "exploded", to produce a Level 1 DFD that shows some of the detail of the system being modelled. The Level 1 DFD shows how the system is divided into sub-systems (processes), each of which deals with one or more of the data flows to or from an external agent, and which together provide all the functionality of the system. It also identifies internal data stores that must be present for the system to do its job and shows the flow of data between the various parts of the system.

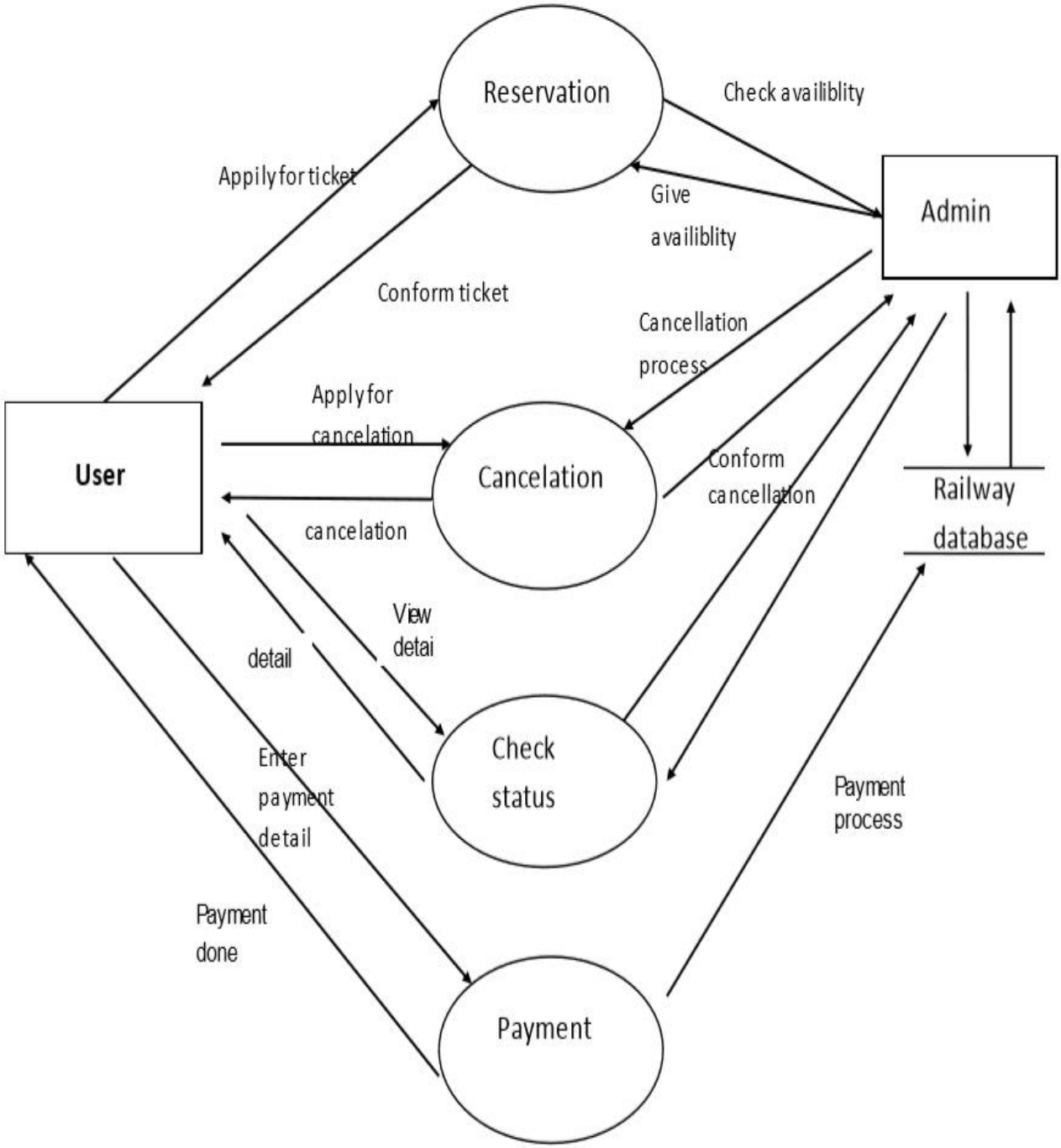
I. LEVEL 0:



II. LEVEL 1:



III. LEVEL 2:



F. TEST CASES

Test Scenario	Test Objective	Test Case	Description	Input	Expected Result
Successful launching of application	To Verify for the successful launching of the application	TC_001	•Open the Browser •Enter the test URL •Click on 'GO' button	Test URL http://www.irctc.co.in	Login page should be displayed
Successful login of the user	To Verify for the successful login of the user	TC_002	•Open the Browser •Enter the test URL •Click on 'GO' button •Enter the valid username in "Username edit field" •Enter the valid Password in "Password edit field" •Click on 'login' button	Test URL http://www.irctc.co.in UN: test PWD: test	Homepage should be displayed, and the left navigation bar must contain "Plan my travel" link.
Open Plan my Travel page successfully	To verify for the display of "Plan my Travel" screen along with following •From edit field & "Fetch Station code" button at the right side of edit field, by default "Enter City Name" message should be displayed inside from edit field. •To edit field & "Fetch Station code" button at the right side of edit field, by default "Enter City Name" message should be displayed in side to edit field. •Date field & "Open to calendar" button at the right side of Date field, by default it	TC_003	•Open the Browser •Enter the test URL •Click on 'GO' button •Enter the valid username in "Username edit field" •Enter the valid password in "Password edit field" •Click on 'login' button •Click on the "Plan My Travel" link at the left navigation bar	Test URL http://www.irctc.co.in UN: test PWD: test	The "Plan my Travel" screen should be displayed along with following •From edit field & "Fetch Station code" button at the right side of edit field, by default "Enter City Name" message should be displayed inside from edit field. •To edit field & "Fetch Station code" button at the right side of edit field, by default "Enter City Name" message should be displayed inside to edit field. •Date field & "Open to calendar" button at the right side of Date field, by default it should display current date and

	should display current date and should be in "DD-MM-YYYY" format. •Class field (Combo box), by default it should show "Select class" message inside box. •Ticket Type along with help link i-ticket radio button •e-ticket radio button •Quota Check box for Tatkal quota along with help link •Find Transfer button •Reset button				should be in "DD-MM-YYYY" format •Class field (Combo box), by default it should show "Select class" message inside box. •Ticket Type along with help link •i-ticket radio button •e-ticket radio button •Quota Check box for Tatkal quota along with help link •Find Transfer button •Reset button
Leave the "From edit field" without entering any data & enter valid data in remaining fields.	To verify for the "From edit field" not to accept an empty field.	TC_004	Open the Browser •Enter the test URL •Click on 'GO' button •Enter the valid username in "Username edit field" •Enter the valid Password in "Password edit field" •Click on 'login' button •Click on the "Plan My Travel" link at the left navigation bar •Leave the "From edit field" without entering any data •Enter valid city name in "To edit field" •Enter valid date in "Date field" •Select valid Class •Select valid Ticket Type •Click on 'Find Trains' button	Test URL http://www.irctc.co.in UN: test PWD: test	It should pop up an error message "Enter Value for Train From".