Name of Student:

Date of Performance: **Date of Completion:**

Experiment No: 2

Title: Designing Railway Reservation System

Aim: To design Railway Reservation System

Requirements: Single Computer (preferably Pentium IV+) and any Open Source/Freeware/Shareware CASE Tool for Analysis & Design

Prelab:

Problem Definition

The Railway Reservation System (RRS) does and manages the reservations offline & online throughout the country (India). The system is made accessible to all the zones of railway in India such as central, Mumbai-central, western, eastern, northern, southern, south-east, north-east, south-west, north-west, Deccan etc. The RRS will need the little basic knowledge of handling and operating the computer to the normal user. The users can browse the Kiosks/Website(s) for enquiry regarding reservations and knowing the time schedule of trains.

Software Requirements Specification

Purpose

The Railway Reservation System (RRS) will help the passengers to reserve the train tickets for traveling in any nook and corners of the country and that too from any remote part of the country, provided it is facilitated with Reservation Centres/Internet facilities. The goal behind creating the software is to relieve the burden of the RR authority (department) and create a user compatible and friendly scenario while traveling in any part of country. It will reduce the manpower needed to make registration and enrolment of passengers, updating, maintaining records etc.

The database created will serve the purpose. It will even benefit both passengers and booking centre by reducing time, money and energy.

Scope

The broad spectrum that we are considering while designing the scope of the project is as follows:

The railways are categorized as Rajdhani express, Shatabdi express, Super-fast trains, Passenger trains, Jan-Shatabdi express, Goods carrier etc.

The trains are even categorized on the tracks on which they are running as Broad gauge, Narrow gauge and Meter gauge. The trains are allocated specific numbers for their identification which is considered as an important aspect.

In trains, we have various boogies classified as: First Class, Second Class, AC First Class, AC Second Class, AC 2-Tier, AC 3-Tier, general compartments, compartments reserved for women, a section kept as parcel-van (i.e. carrying parcels). Total 72 births are present in each one of the boogies except in some higher classes. Each of the compartments consists of 7 births as 2-lower, 2-upper, 2-middle, one side lower and upper.

The reservations are bifurcated as confirmed, RAC, waiting, general, etc. In case of confirmed, the complete birth is reserved, if we get the waiting seat i.e. we can at least get entry in the train. The next step of waiting is RAC i.e. Reservations Against Confirmation wherein our reservations are confirmed, but we will be getting only half of the birth and gradually it will be transformed to confirm seats.

The mode of payment that the user can follow is by cash for offline and other Net banking, Credit & Debit Cards for online reservations.

Definitions, Acronyms and Abbreviations:

1. **RRS:** Railway Reservation System
2. **RAC:** Reservation against Confirmation - a stage mediator to waiting and confirm reservation.
3. **AC:** Air Conditioned Coaches - more luxury and comfort, passengers are given the facility of AC compartment.

Feasibility Study

Projects on the margin of the experience are not so easy. A team may need to spend several months to develop software. The feasibility team carries initial architecture and design of

the high requirements to the point at which it can answer the questions. When team gets negative answers, reduction in requirement may be negotiated.

Software cost and effort estimation will never be an exact science. Too many variables, human, technical, environmental, political can affect the ultimate cost of software and effort applied to develop it.

Overview

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.

Product Perspective:

- 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.

Software requirements:

Any window based 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.

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

Product Functions:

Booking agents with varying levels of familiarity with computers will mostly use this system With this in mind, an important feature of this software is that à 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 particular train to be selected from the displayed list. All the details of the train are shown

1. train Number
2. Date, time and place of departure
3. Date, time and place of arrival
4. TRAIN Duration
5. Fare per head

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**.**

1. Credit card type
2. Credit card number
3. CVC number of the card

4. Expiration date of the card
5. 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.

Specific Requirements

Interface Requirements:

1) User interfaces:

As the RRS is developed as offline & on-line system, the online user interface will be a Java-capable web browser.

2) Hardware Interface:

a. A work station connected to the internet.

b. Intel Pentium IV+ processor.

c. 128 MB RAM or higher. .

d. I/O devices as keyboard, mouse and printer.

3) Software Interfaces:

Java-capable web browser with access to internet, the Java Development Kit (JDK) from Sun Microsystems or Integrated Development Environment (IDE) and a text editor for preparing HTML files. Visual studio 6.0 is used for getting best front end. The platform is WINDOWS based.

4) Communication Interfaces:

Internet access and/or direct access at the centres for the railway reservation.

Stakeholders:

Stakeholders are the members who are involved in developing, handling using the software. Where, developers of software include analyzers, designers, programmers, persons involved in maintenance and testing, software project planner and manager, customers and users.

Functional Requirements

1. As the government (central), railway ministry and reservations & jurisdiction sector changes their policies and strategies, the administration must be able to make the time-to-time updation in the database.

2. The administrator must be able to make the changes regarding the policies such as concessions for children and senior citizens, cancellation of the tickets, refunding the money for cancellation with different criteria e..g. complete refund within 24 hours of cancellation and thereafter same duties applying as penalty in terms of percentage.

3. User authentication must be provided.

4. As soon as the reservations are confirmed or whatever, simultaneously the updation must occur at every location within fraction of seconds with minimum possible delay, avoiding crashing of reservations between 'n' number of users and must be reflected throughout.

5. Payment must be accepted as per the age of person like half-ticket for children between the age of 10 years, full for adults and concession for senior citizens need not compulsory to pay entire cost for the tickets, some specified percentage of token can be accepted.

Performance Requirements

The performance requirement is different in terms of static as well as dynamic numerical requirements placed on software or at Kiosks with RRS.

Static: Number of simultaneous users of RRS is 30 in training facility with 30 workstations connected to internet and running a Java-capable web browser.

Static: Each RRS workstation has a high resolution 1024 x 1024 pixel Sony 17-inch color monitor.

Dynamic: All drag and drop operations are accomplished within 100 milliseconds during RRS interact sessions.

Dynamic: Updation of the database must take place within few seconds after user has entered his/her reservation.

Constraints

- The RRS must allow quick and easy retrieval and input of data through-the graphical user interface (GUI) provided by the system.
- The RRS will be user friendly and easy to use by novices as well as professionals.
- The RRS enforces a WHAT-YOU-SEE-IS-WHAT-YOU-GET' (WYSIWYG) display (no information is hidden).
- The RRS provides mobile computing capability and is executable by any number of RRS having access to web browser.
- The RRS maintains a knowledge base about all trains running and on which track or delayed or their current status, railway tracks, weather etc.
- The RRS controls flow of information in the system such as Net banking, Credit/Debit card etc. payments. Even reservations that are not on-line can be done by visiting the enquiry and reservation centre and the updations must be done accordingly.

Non functional requirement

Security

The system use 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.

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

Availability

The system should be available at all times, 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 world 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.

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.

Supportability

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

System architecture diagram

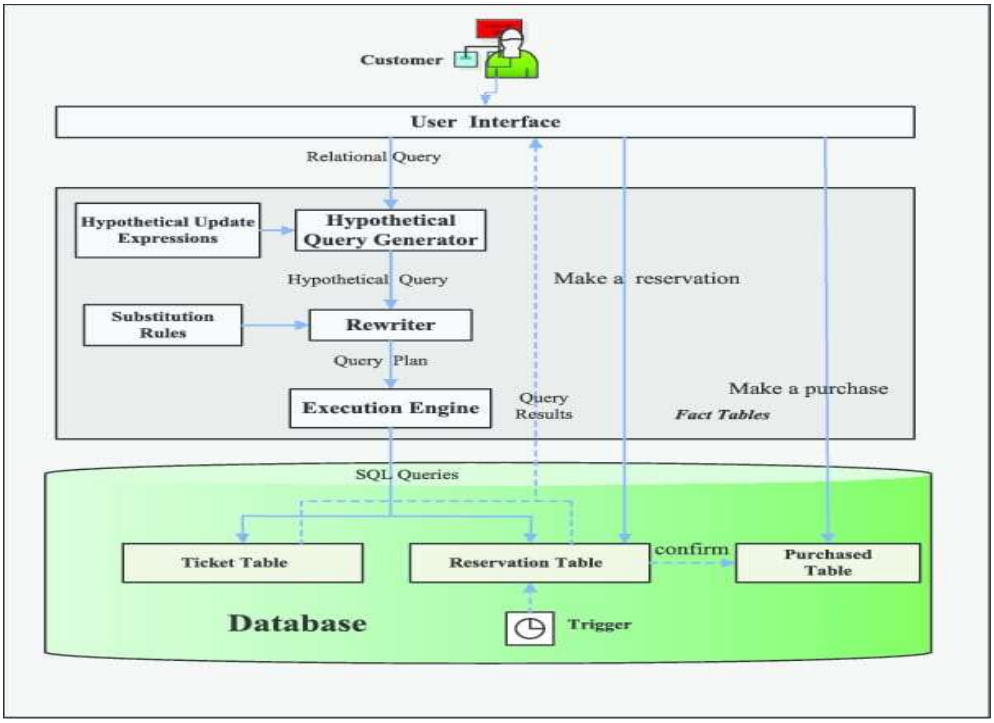

Fig 1: system architecture diagram for railway reservation system

System Development Model

System design is the process of defining the architecture, components, modules, interface, and data for a system to satisfy specified requirement through system modelling. One could see it as the application of system theory to produce development. The design of this system will be user friendly. It shall be designed in such a way that employees will be able to navigate easily through the information supplied on the system. In other words, system design consists of design activities that produces system specification satisfying the functional requirement that were developed in the system analysis process. System design specifies how the system will accomplish. System design is the structural implementation of the system analysis.

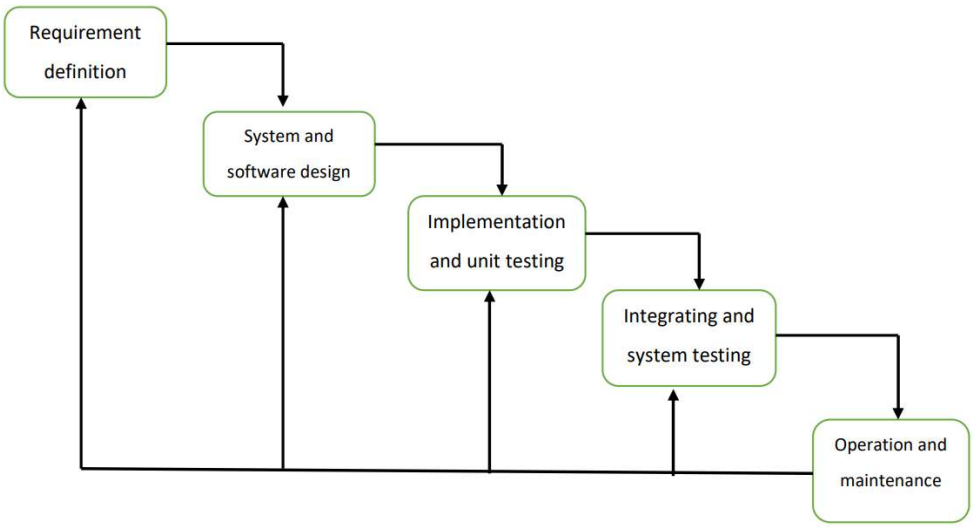

Fig 2: waterfall model

The diagram above is a system development life cycle that illustrate how the design of the project is broken down into five different phases, requirement definition, system and software design, implementation and unit testing, integrating and system testing, operation and maintenance.

The purpose Railway Reservation system information about railway and store will start with project planning by determining the user of the system, aims and objective of the project. After these, extensive research will be done to determine how to design an effective Requirement definition System and software design Implementation and unit testing Integrating and system testing Operation and maintenance Software requirement specification Page 10 system, as well as to review the current system. Then the design was with an initial prototype of the system, and then refined it based on their suggestion. Phases of analysis, design and implementation were performed iteratively until users and designers agreed on a final system specification. At this point, the project could move to final implementation phase

Inlab:

The UML diagrams developed during the laboratory session for Railway Reservation System are as follows:

1. Data flow diagram (DFD):

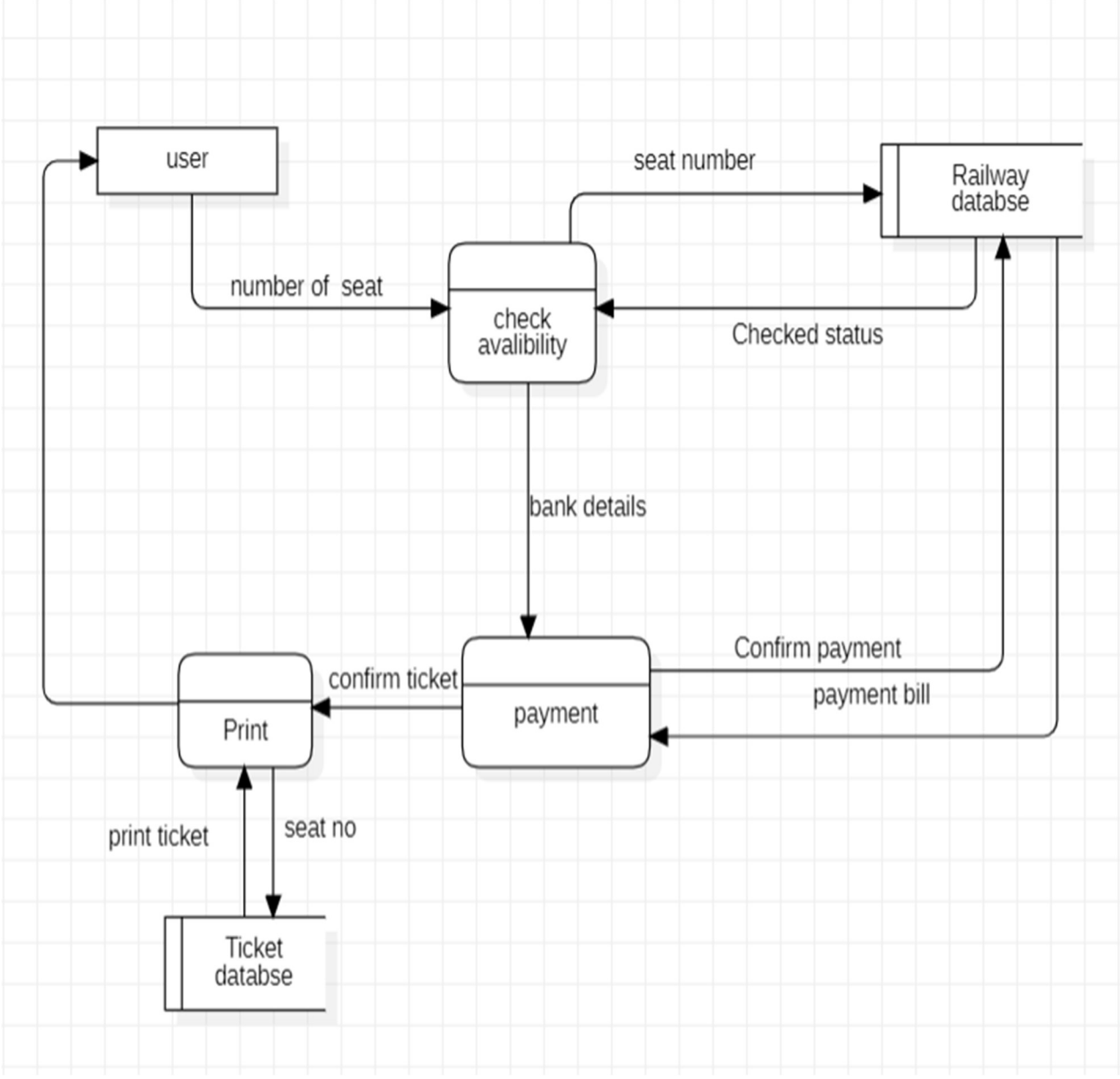

Fig3: Data flow diagram of Railway Reservation system

2. Use case diagram:

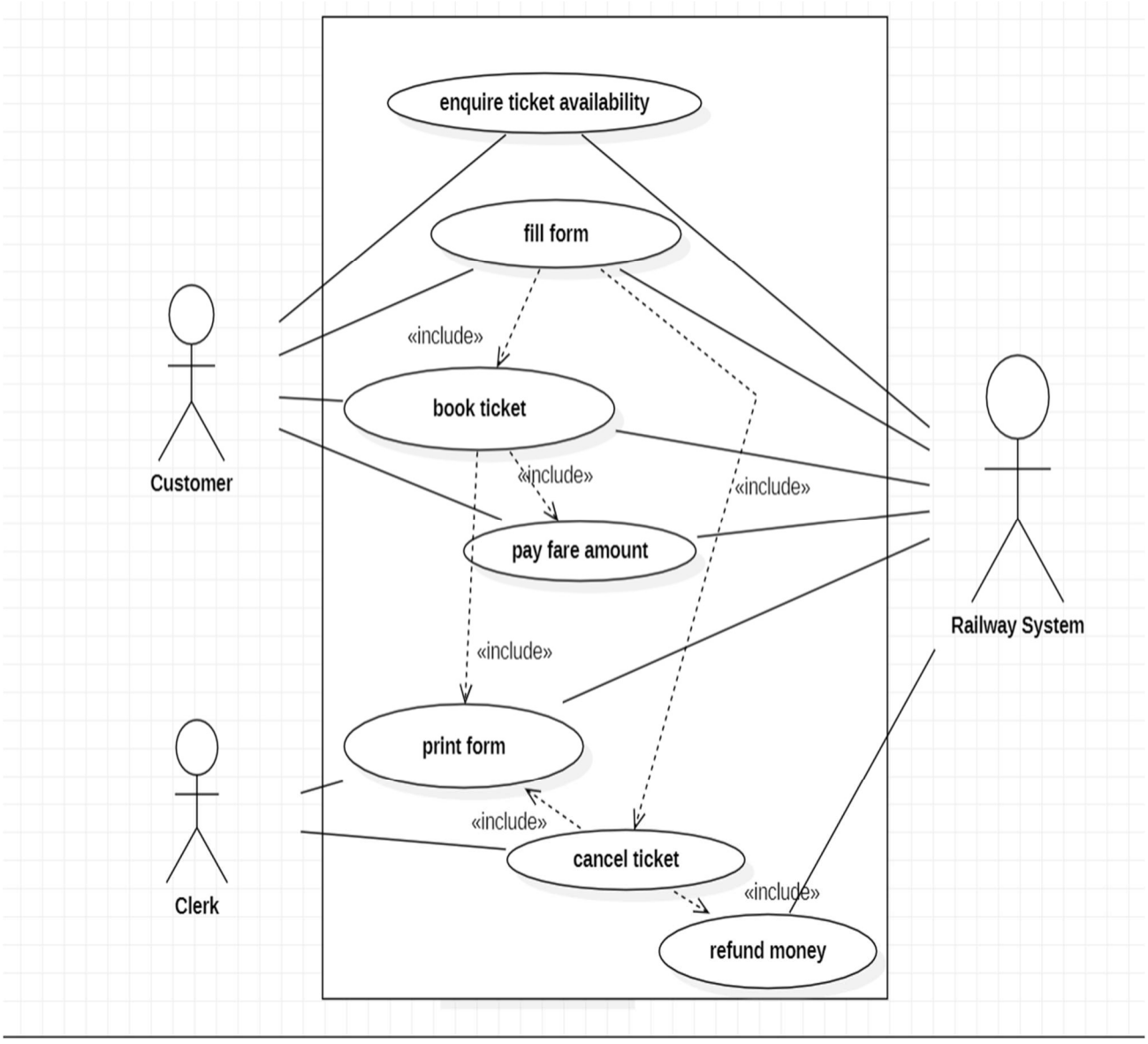

Fig4: Use case diagram of Railway Reservation system

3. Class diagram:

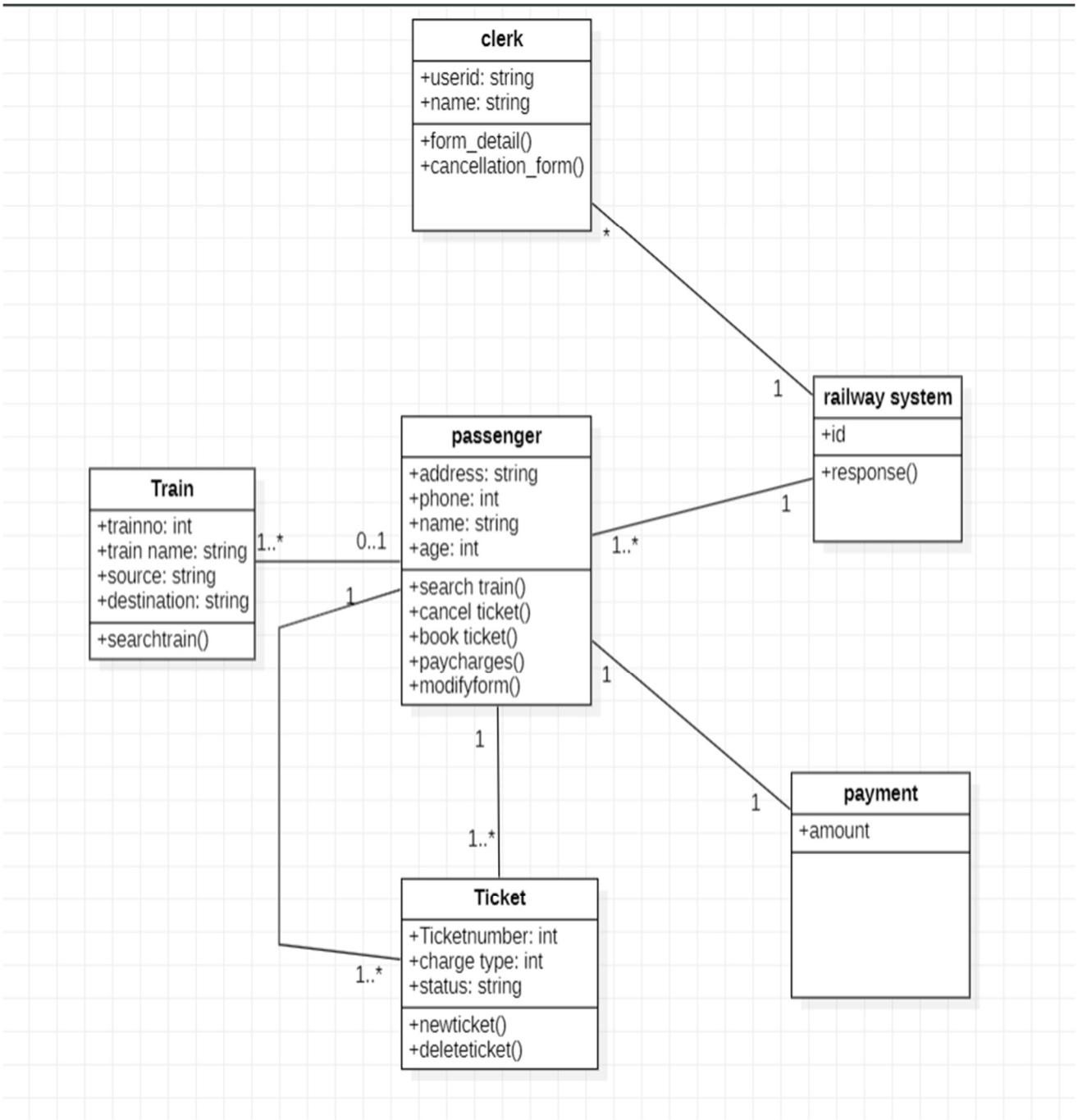

Fig5: Class diagram of Railway Reservation system

4. Sequence diagram:

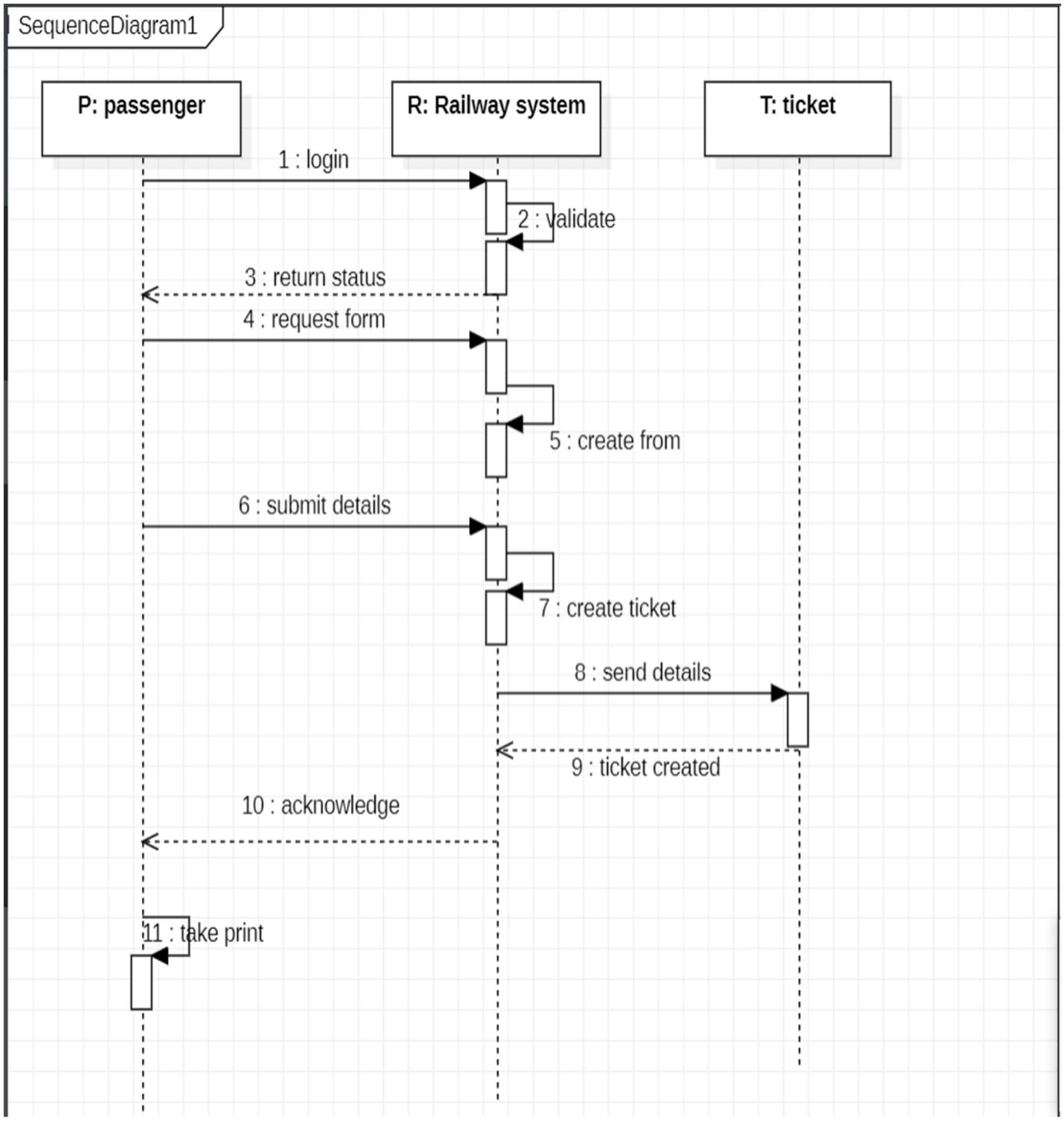

Fig6: Sequence diagram of Railway Reservation system

5. Collaboration/ communication diagram:

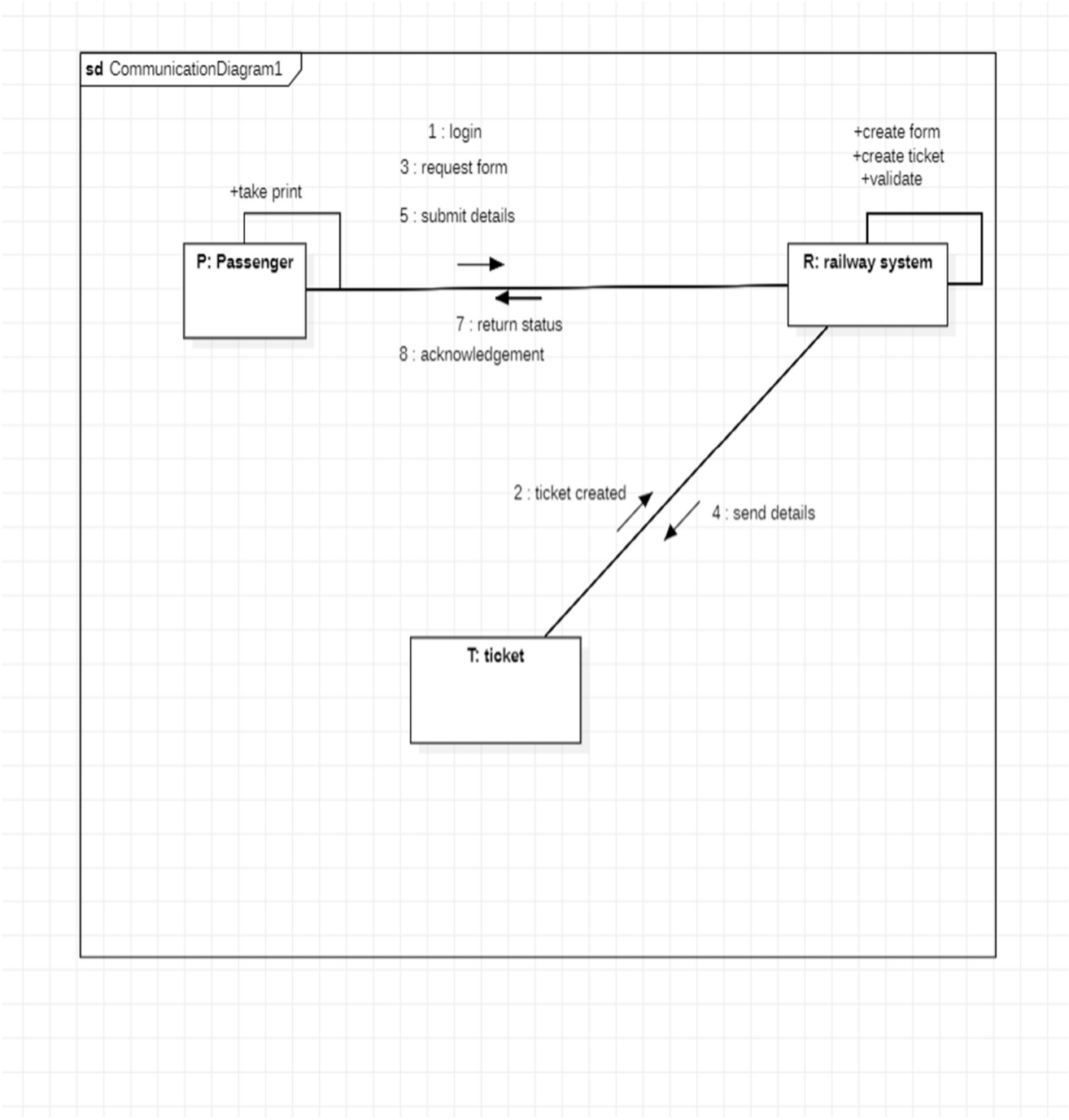

Fig7:Collaboration diagram of Railway Reservation system

6. State chart diagram:

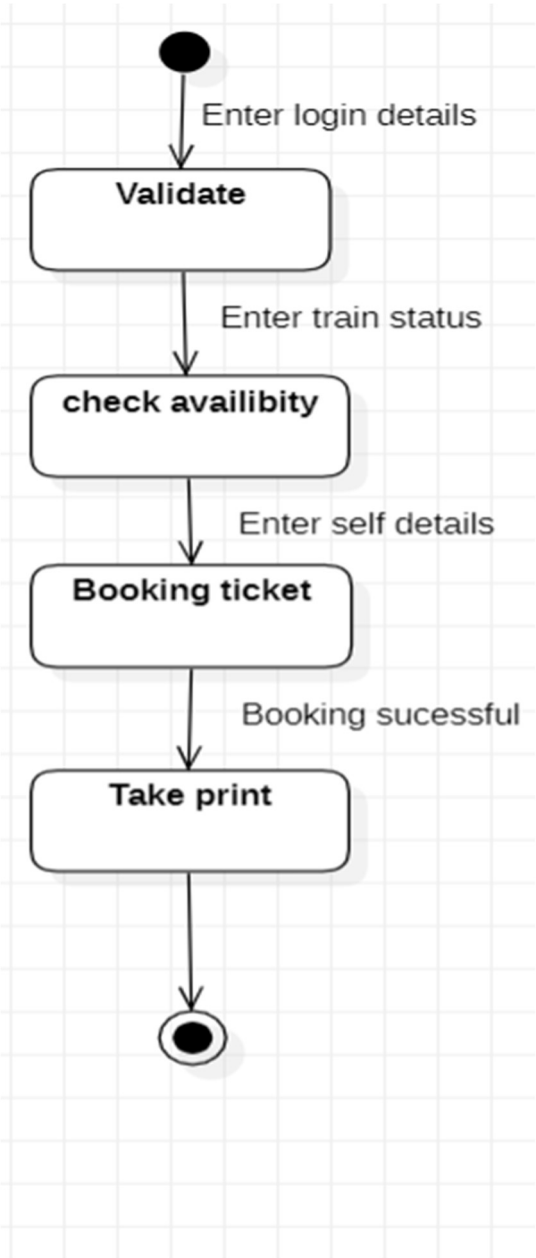

Fig7:State chart diagram of Railway Reservation system

7. Activity diagram:

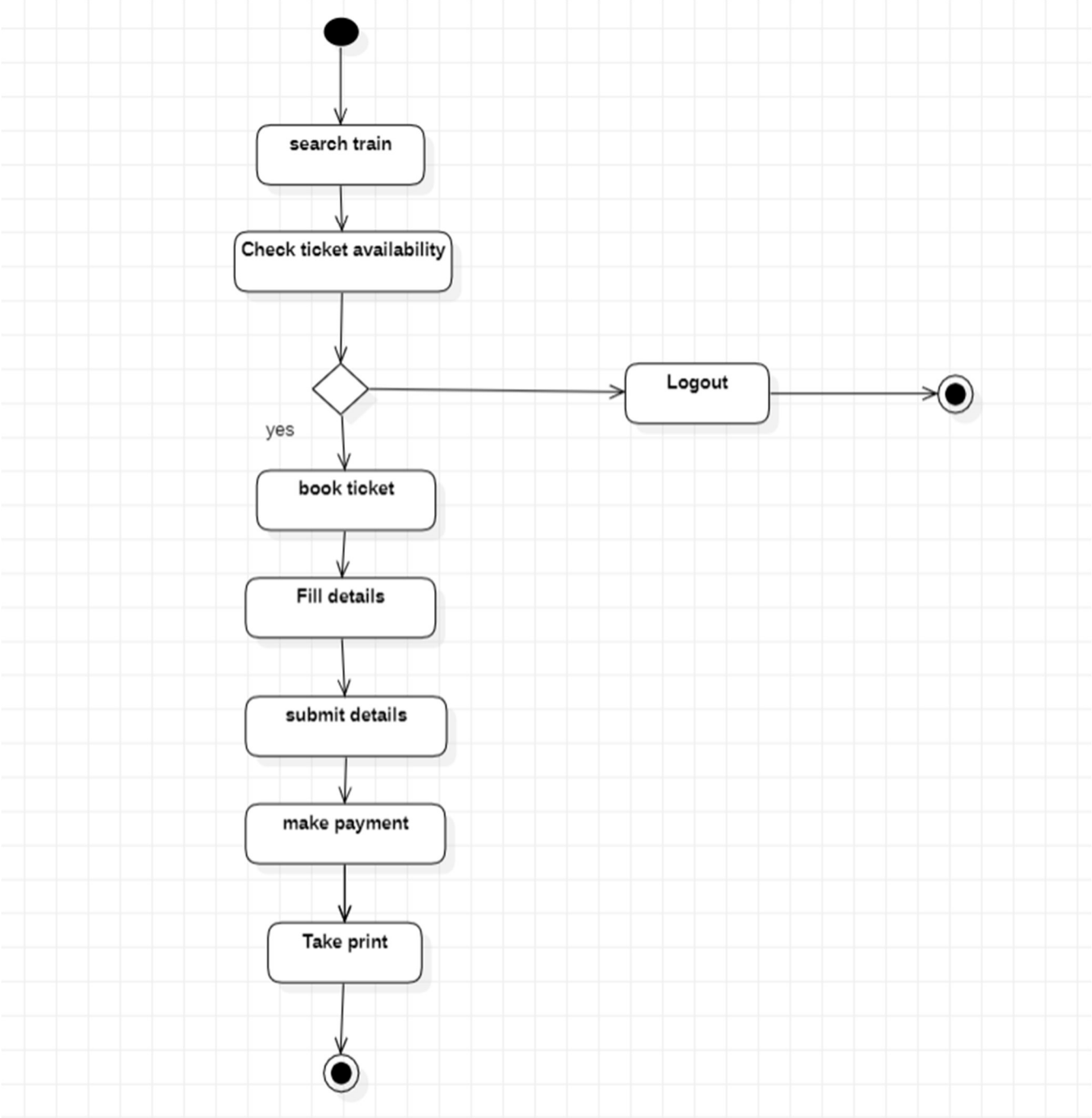

Fig8:Activity diagram of Railway Reservation system

8. Component diagram:

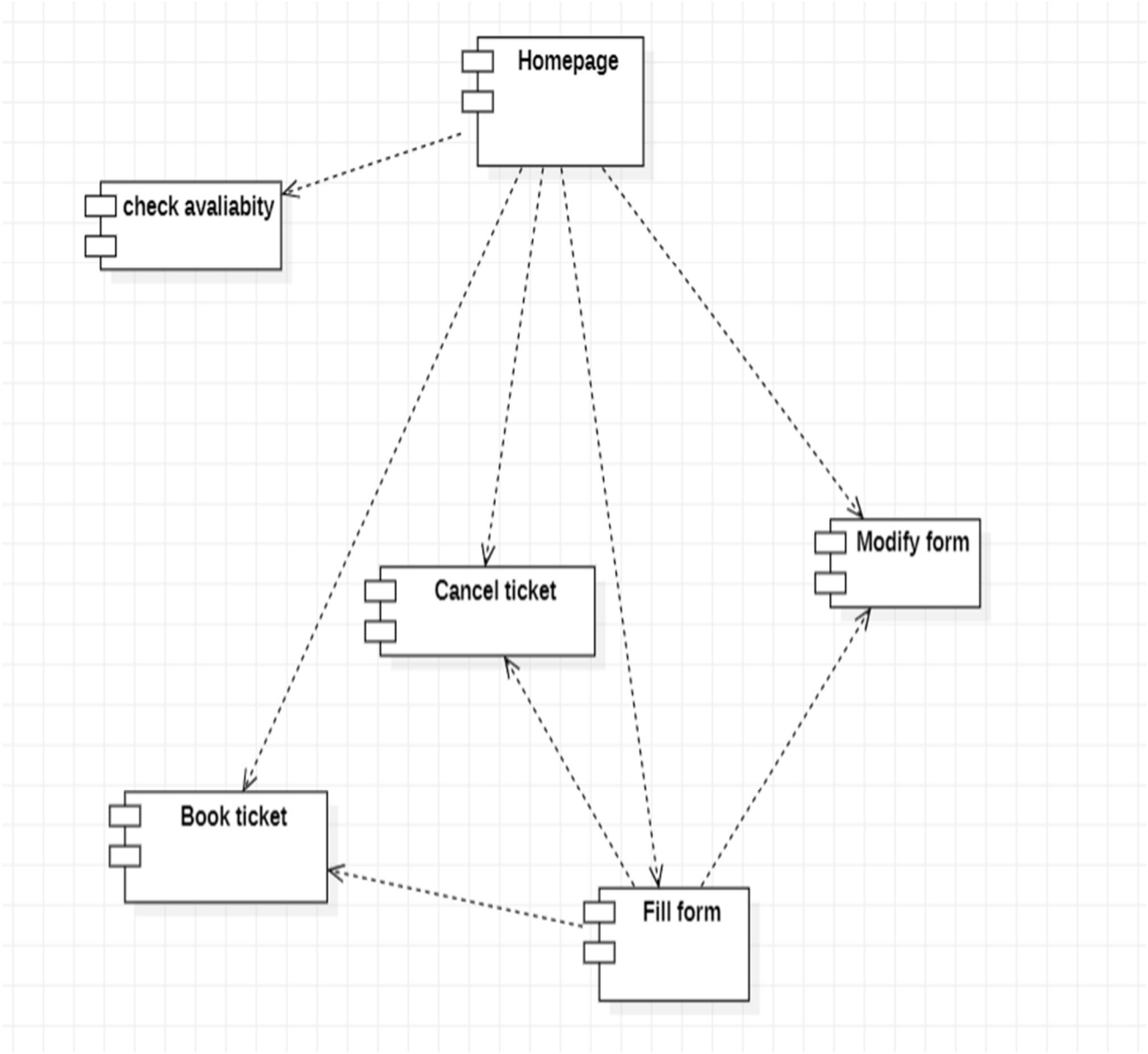

Fig9:Component diagram of Railway Reservation system

9. Deployment diagram:

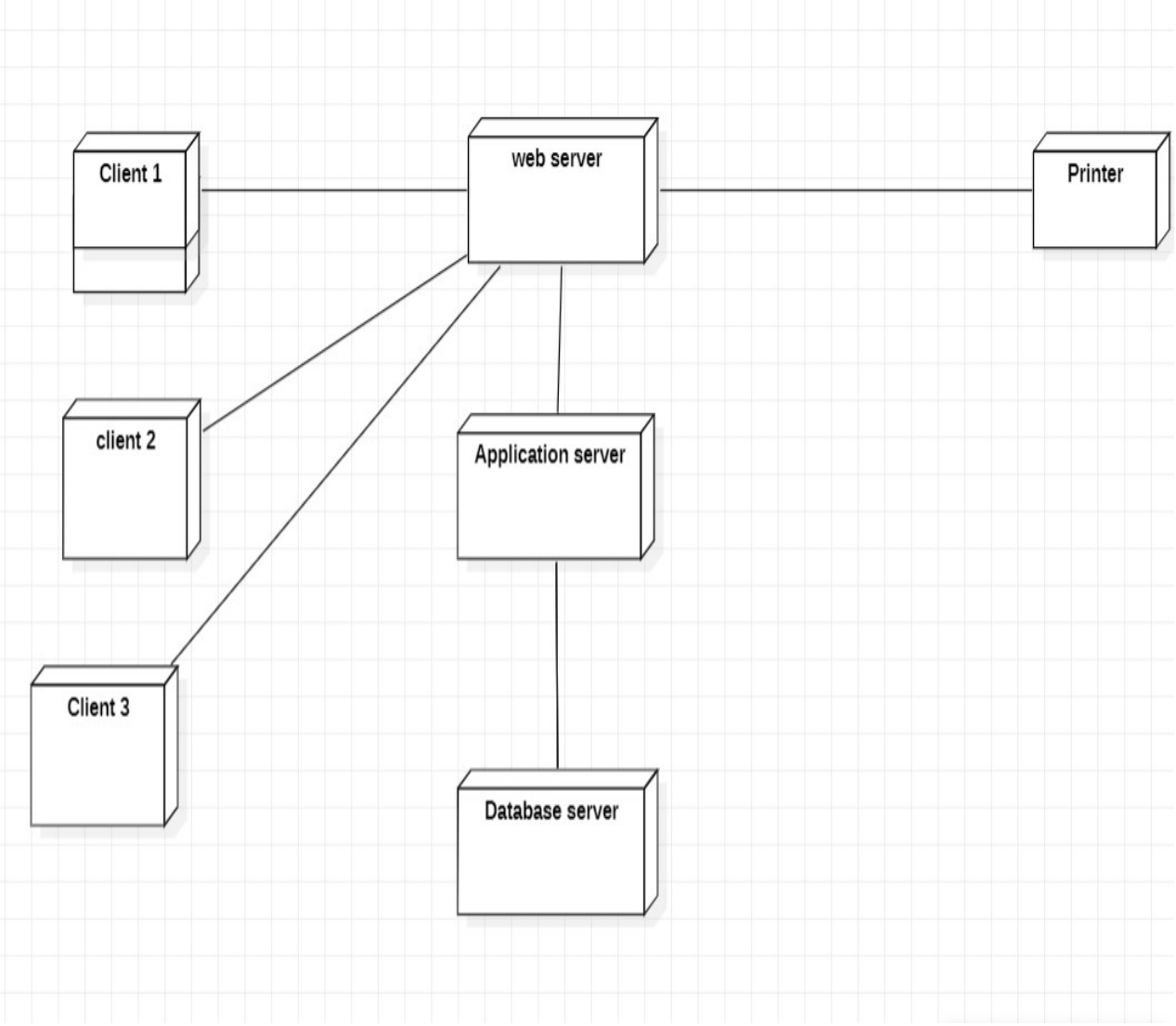

Fig10:Deployment diagram of Railway Reservation system

Questions

Name:

Class:

Section:

Roll No:

Signature:

Q.1)List all classes used in the Class diagram.

Q.2)Write down all the attributes of any one class with visibilities and data types.

Q.3)Write down all the operations of any one class with visibilities.

Q.4)What different types of relationships are used in the Class diagram of RRS System?

Q.5) What are the Objects used in Sequence diagram of RRS System?