SOFTWARE ENGINEERING (UE22CS341A)

SYSTEM REQUIREMENTS SPECIFICATIONS

SANJANA M(PES1UG22CS527)

SANNIDHI V KUMAR(PES1UG22CS533)

1. Introduction

1.1 Purpose

The purpose of this project is to design and implement a distributed railway reservation system capable of handling all reservation-related functionalities efficiently. The system aims to facilitate the reservation and management of train tickets by providing a user-friendly interface for passengers and administrative capabilities for clerks and administrators. This system will ensure that passengers can book and cancel tickets, check reservation statuses, and access train schedules conveniently. Additionally, the system will help railway administrators maintain up-to-date train information, including schedules and availability, thereby improving the overall passenger experience and operational efficiency of railway services.

1.2 Scope

The scope of this project includes the development of a web-based railway reservation system distributed across five geographical zones. Each zone will have the same functionalities, ensuring consistent user experience and data synchronization across the system. The key functionalities within the scope of this project are:

1. Train Information Management: Administrators can update train details such as train names, numbers, and schedules. They can also manage availability information and other relevant train-related data.

2. Seat Reservation: Clerks can check the availability of seats on specified dates for particular trains and reserve them for passengers. A unique PNR number will be generated for each reservation.

3. Cancellation of Reservations: The system allows clerks to cancel reservations, update the system accordingly, and issue a cancellation ticket with details of the fare and any deductions.

4. Passenger Interaction: Passengers can check their reservation status online using their PNR number, view train schedules, and access other train-related information.

5. Report Generation: The system can generate various reports, such as reservation charts, train reports, and reservation tickets, including details like train number, journey date, boarding and destination stations, passenger details, and fare.

6. Comparison of Fares: Although the system primarily handles railway reservations, it is also designed to allow passengers to compare fares for air travel between various cities, enhancing its utility and value to users.

1.3 Definitions, Acronyms, and Abbreviations

- PNR (Passenger Name Record): A unique identifier assigned to each reservation made in the system. It contains the details of the passenger and the journey.

-RAC (Reservation Against Cancellation): A type of ticket where the passenger is allowed to board the train but may not get a confirmed seat or berth. They may get a seat if there's a cancellation.

- GUI (Graphical User Interface): A visual interface that allows users to interact with the system through graphical elements such as buttons, icons, and menus.

- Administrator: A user with the highest level of access who can manage all aspects of the train information, including updates to schedules, train names, and numbers.

- Clerk: A system user responsible for interacting with passengers, checking seat availability, making reservations, and handling cancellations.

- Distributed System: A system that is spread across different geographical zones but functions as a single coherent system.

-Reservation Chart: A report generated by the system listing all the confirmed reservations for a particular train on a specific date.

- Train Report: A report that provides detailed information about train schedules, availability, and other relevant data.

- Cancellation Ticket: A document provided to the passenger upon cancellation of a reservation, including the total fare and the amount deducted due to the cancellation.

1.4 References

http://php.net/

http://www.http://en.wikipedia.org/wiki/PHP

http://www.w3shools.com

IEEE Standard for Software Requirements Specifications (IEEE Std 830 1998)

2.Overview

The document is structured into sections detailing the functional and non-functional

requirements, system features, external interface requirements, and more.

2.1 Functional or Specific Requirements

The Railway Management System must meet the following functional requirements:

1) User Login and Authentication: Users (passengers, clerks, and administrators) must be able to log in to the system using their unique credentials. The system will authenticate users to ensure security and appropriate access levels.
2) User Registration (Signup Option): New users should have the option to sign up for the system. Passengers can create an account by providing necessary details such as name, contact information, and password.
3) Train Information Management: Administrators must be able to add, update, and delete information about trains, including train names, numbers, schedules, and routes.
4) Seat Reservation: The system should allow clerks to check seat availability on a specified train and date. If seats are available, the system should facilitate seat reservation and generate a unique PNR number for the passenger.
5) Ticket Cancellation: The system should provide a feature to cancel reservations. Clerks or passengers should be able to cancel tickets by entering the PNR number, and the system will update the seat availability accordingly.
6) PNR Status Check: Passengers should be able to check their reservation status online by entering their PNR number. The system will display the current status, such as confirmed, RAC, or waiting list.
7) View Train Schedules: Passengers and clerks should be able to view the detailed train schedules, including arrival and departure times, days of operation, and available classes.
8) Fare Calculation and Payment Processing: The system must calculate the total fare based on the journey details, class, and other criteria. It should support multiple payment methods, such as credit/debit cards, net banking, and UPI.
9) User Logout: All users should have a logout option to securely end their session in the system.

2.2 NON-FUNCTIONAL REQUIREMENTS

All of the application data is stored in an Oracle database, and therefore an Oracle Database must also be installed on the host computer. As with Apache2, this software is freely available and can be installed and run under most operating systems. The server hardware can be any computer capable of running both the web and database servers and handling the expected traffic. For a small-scale restaurant that is not expecting to see much web traffic, an average personal computer may be appropriate. Once the site starts generating more hits, though, it will likely be necessary to upgrade to a dedicated host to ensure proper performance. The exact cut-offs will need to be determined through a more thorough stress testing of the system.

2.3 HARDWARE REQUIREMENT

- A desktop or laptop with a proper internet connection
- 2 500GB or 60GB of the hard disk
- 3.4GB 2GB of the RAM
- 4 Windows 7 or 8 or 10 Operating system

2.4 SOFTWARE REQUIREMENTS

2.4.1 Server Side

1. Programming language: PHP 5.6.31
2. Web Server: Apache 2.4.27
3. Database: SQL 5.7.19

2.4.2 Client Side

1. Programming language: JAVASCRIPT, HTML, CS
2. OS: windows7/8/10
3. MYSQL server

2.4.3 PHP

PHP is a server-side scripting language designed primarily for web development but also used as a general programming language PHP code may be embedded into HTML or HTML5 markup or it can be used in combination with various web template systems, web content management systems, and web frameworks. PHP code is usually processed by a PHP interpreter implemented as a module in the web server. The web server software combines the results of the interpreted and executed PHP code, which may be any type of data, including images, with the generated webpage.

2.4.4 Web Server: Apache

Apache is the most widely used web server software. Developed and maintained by Apache Software Foundation, Apache is open-source software available for free. It runs on 67% of all web servers in the world. It is fast, reliable, and secure. It can be highly customized to meet the needs of many different environments by using extensions and modules. Most WordPress hosting providers use Apache as their web .server software. However, WordPress can run on other web server software as well.

2.4.5 HTML

HTML is an acronym that stands for HyperText Markup Language.

HyperText: HyperText simply means "Text within Text". A text has a link within it, isa hypertext. Every time you click on a word that brings you to a new webpage, you have clicked on a hypertext. Markup language: A markup language is a programming language that is used to make text more interactive and dynamic. It can turn a text into images, tables, links, etc. An HTML document is made of many HTML tags and each HTML tag contains different content.

2.4.6 JAVASCRIPT

Javascript is a dynamic computer programming language. It is lightweight and most commonly used as a part of web pages, whose implementations allow client-side script to interact with the user and make dynamic pages. It is an interpreted.

2.5 Environmental Requirements

- The system hardware (servers, workstations, ATMs) should operate effectively within a temperature range of 10°C to 40°C

- The system should function in environments with humidity levels between 20% and 80%, non-condensing

- The system requires a stable power supply to avoid disruptions

2.6 REQUIREMENTS TRACEABILITY MATRIX

The RTM ensures that all requirements are covered by design, development, and testing

activities. Below is a simplified RTM example for the Railways Management system:

Requirement ID	Requirement Description	Module	Test Case ID	Verification Method	Priority
FR-01	User Login and Authentication	User Management	TC-01	Functional Testing	High
FR-02	User Registration (Signup Option)	User Management	TC-02	Functional Testing	High
FR-03	Train Information Management	Admin Management	TC-03	Functional Testing	High
FR-04	Seat Reservation	Reservation Module	TC-04	Functional Testing	High
FR-05	Ticket Cancellation	Reservation Module	TC-05	Functional Testing	High
FR-06	PNR Status Check	PNR Management	TC-06	Functional Testing	Medium
FR-07	View Train Schedules	Schedule Module	TC-07	Functional Testing	Medium
FR-09	Fare Calculation and Payment Processing	Payment Module	TC-09	Functional Testing	High
FR-10	User Logout	User Management	TC-10	Functional Testing	High
NFR-01	Database Integrity and Consistency	Database Management	TC-11	Database Testing	High
NFR-04	Security (Data Encryption using SSL/TLS)	Security Module	TC-14	Security Testing	High
NFR-06	Usability (Intuitive and User-Friendly Interface)	UI/UX Design	TC-16	Usability Testing	Medium