SOFTWARE REQUIREMENTS SPECIFICATION

**For**

**AIRLINES RESERVATION SYSTEM**

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# Introduction

## Purpose

## The documentation of software requirement specifications (SRS) for an airline reservation system serves as a comprehensive guide outlining the functional and non-functional requirements, constraints, and system behavior. This document acts as a blueprint for developers, designers, and stakeholders involved in creating and maintaining the system.

## Document Conventions

* + - Entire document should be justified.
    - Convention for Main title

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* + - Convention for Sub title

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* + - Convention for body

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## Scope of Development Project

## The project targets both airline staff and passengers. It serves The airline reservation system involves transforming the conventional reservation processes into an online platform, enabling users to access their accounts, check flight availability, and ascertain the maximum limits for ticket reservations.as a comprehensive user interface facilitating all aspects of airline reservation management for staff and flight booking for passengers. This reservation system can be implemented in any airline, existing or new, enabling efficient management of flight schedules, ticket bookings, and monitoring. Its adaptability is particularly beneficial for educational institutions or any airline where adjustments to the system can be easily made to meet specific needs and requirements.

## This project holds adaptability across diverse scenarios. Its flexibility allows for seamless integration of new functionalities when needed, ensuring reusability within all modules. Java serves as the primary language for the project's development, offering advantages such as superior performance, a wide array of available tools, compatibility across various platforms, access to extensive libraries, cost-effectiveness (freely available), and streamlined development processes.

**1.4 Definitions, Acronyms and Abbreviations**

JAVA -> platform independence SQL-> Structured query Language ER-> Entity Relationship

UML -> Unified Modeling Language

IDE-> Integrated Development Environment SRS-> Software Requirement Specification

## References

* + 1. Books
* Designing and Implementing Airline Reservation Systems by Philippe Chantecaille
* Object-Oriented Analysis and Design with Applications" by Grady Booch, Robert A. Maksimchuk , Michael W. Engle
* Airline Operations and Management by Theodore Panayotov and John Rapoport.
  + 1. Websites
* <https://www.slideshare.net/arokhandelwal/airlinesnopsisfinal>
* <https://itsourcecode.com/free-projects/c-projects/airline-reservation-system-project-in-c-with-source-code/>
* https://www.iata.org/en/publications/manuals-standards-regulations/

# Overall Descriptions

## Product Perspective

Use Case Diagram of Airlines Reservation System

This diagram offers an overarching view of the project. Users within the system can be categorized as either airline staff or passengers. The system will incorporate a search feature facilitating resource exploration, allowing searches based on criteria like flight name or flight number. Additionally, airline staff can manage flight resources and user data within the system. Passengers utilizing the system can request flight booking, modifications, or cancellations, subject to specific guidelines and criteria.

## Product Function

Entity Relationship Diagram of Airlines Reservation System.

The Airline Reservation System furnishes real-time online access to flight availability and passenger information. The primary objective is to streamline manual processes. This software effectively manages flight bookings, cancellations, fine calculations, and report generation tailored to user preferences. Administered by airline staff, the system oversees passenger bookings and flight records. Passenger details and booking statuses are stored and managed within the system database, accessible to authorized personnel such as administrators or passengers seeking account information.

## User Classes and Characteristics

## Within the classification of 'User Classes and Characteristics' for the Airline Reservation System, diverse services are tailored to distinct user categories: [Staff/Passenger]. The Staff assumes a controller role akin to an administrator, managing system functionalities. Passengers encompass individuals linked to the airline, utilizing online services for flight reservations and management.

The functionalities accessible to the Administrator in the Airline Reservation System include:

* Facilitating flight bookings for passengers.
* Accessing and viewing available flight categories.
* Viewing the list of flights in each category.
* Managing returned tickets from passengers.
* Adding new flights and their details to the database.
* Editing information pertaining to existing flights.
* Generating reports for existing flights.
* Generating reports for issued flight tickets.
* Accessing all passengers accounts.

The functionalities accessible to Passengers in the Airline Reservation System include:

* Viewing available flight categories
* Accessing the list of flights in each category
* Creating and owning an account in the airline system
* Viewing owned flight reservations
* Requesting new flight bookings
* Reviewing the history of previous flight reservations
* Searching for specific flights

## Operating Environment

The product will be operating in windows environment. The Airline Reservation System is a website and shall operate in all famous browsers, for a model we are taking Microsoft Internet Explorer, Google Chrome, and Mozilla Firefox. Also it will be compatible with the IE 6.0. Most of the features will be compatible with the Mozilla Firefox & Opera 7.0 or higher version. The only requirement to use this online product would be the internet connection.

The hardware configuration include Hard Disk: 40 GB, Monitor: 15” Color monitor, Keyboard: 122 keys. The basic input devices required are keyboard, mouse and output devices are monitor, printer etc.

## Assumptions and Dependencies

The assumptions are:-

* Error-free coding standards will be maintained throughout the development process.
* The system will prioritize user-friendliness to ensure ease of use for passengers.
* All user, flight, and reservation data will be securely stored in an accessible database linked to the system.
* The system will have ample storage capacity and ensure rapid access to the database for efficient operations.
* It will offer robust search functionality and support swift transaction processing.
* The Airline Reservation System will run continuously, operating 24 hours a day.
* Users will access the system from any computer with internet browsing capabilities and an active internet connection.
* Access to user accounts and actions within the system will require accurate usernames and passwords for authentication.

The dependencies are:-

* The system's functionality will rely on specific hardware and software configurations.
* Development and operation will be based on the outlined requirements and specifications.
* Adequate training and understanding for administrators are essential for effective system utilization.
* General reports must be stored within the system for reference and analysis.
* User information will be securely stored in a database accessible by the Airline Reservation System.
* Any updates or modifications to flight information will be accurately recorded in the database for reliability and accuracy.

## Requirement

Software Configuration:-

This software package is developed using java as front end which is supported by sun micro system. Microsoft SQL Server as the back end to store the database.

Operating System: Windows NT, windows 98, Windows XP Language: Java Runtime Environment, Net beans 7.0.1 (front end) Database: MS SQL Server (back end)

Hardware Configuration:-

Processor: Pentium(R)Dual-core CPU Hard Disk: 40GB

RAM: 256 MB or more

## Data Requirement

## Inputs will comprise queries sent to the database, generating solutions in response. Outputs will encompass solutions to the queries, providing users with details about their flight reservations. User queries, such as booking flights or managing reservations, will serve as inputs. The system will output information when users request their account details, displaying current flight bookings with timestamps and dates for reference.

# External Interface Requirement

## GUI

## The system offers a robust graphical interface tailored for both users and airline staffs. Airline Staffs possess the capability to perform essential tasks within the system, including creating, updating, and viewing flight details.

## Users can access swift reports detailing flight bookings/changes within specified timeframes.

## Offers stock verification and diverse search options based on specific criteria.

## Airline Staffs can personalize the user interface to meet specific requirements.

## All software modules must seamlessly integrate into the graphical user interface and align with defined standards.

## Emphasizes a simple design and standardized templates across interfaces.

## The interface should effectively interact with the user management module, with a dedicated section for login/logout functionalities.

Login Interface:-

For new users not yet registered, they can input their details to create an account. Upon successful creation, they can proceed to 'Login', requiring entry of their username and password. In case of incorrect entry for either the username or password, an error message will prompt the user.

Search:-

In the Airline Reservation System, passengers or administrators can input the specific flight details or flight number they seek, enabling them to search for the desired flight by entering the flight name or number.

Flight Views:-

This feature displays available flight categories and enables administrators to manage them by adding, editing, or removing categories from the list.

Admin Flight Management Panel:-

This interface allows administrators to view flight categories and offers options to add, edit, or delete flight categories from the list.

# System Features

# The system ensures user account security by guaranteeing users that their accounts are protected. This assurance is achieved by implementing:

# Authentication and validation of users via unique identification ensures secure access for members.

# Administrator supervision involves updating account statuses, issuing alerts if passengers attempt to exceed booking limits, and imposing fines for missed flight returns.

# Stringent accountability measures prevent passengers from accessing other passengers' accounts; only administrators have access to view and manage all passenger accounts.

# Other Non-functional Requirements

## Performance Requirement

## The system we're developing is slated to serve as the primary performance system across various branches of the airline, engaging with airline staff and passengers. Hence, it's imperative that the database efficiently meets all the specified requirements crucial for airline operations.

## The system is expected to deliver swift and precise performance.

## The Airline Reservation System must adeptly manage both anticipated and unforeseen errors, preventing data loss and minimizing downtime. It should incorporate error testing to detect invalid login credentials.

## The system should efficiently handle substantial data loads, accommodating a large volume of flights and users seamlessly without errors.

## Safety Requirement

## To mitigate potential risks like virus attacks or operating system failures causing database crashes, it's crucial to implement regular database backups to prevent data loss. Additionally, ensuring the availability of UPS/inverter facilities is necessary to counter power supply interruptions.

## Security Requirement

## The system will implement a secure database.

## Regular users will have limited access, primarily for reading information with restricted editing capabilities, except for personal details.

## Different user types will have predefined access constraints within the system.

## Robust user authentication mechanisms will be in place.

## Stringent measures will be implemented to safeguard users' passwords from potential hacking attempts.

## The system will establish distinct accounts for administrators and passengers, ensuring passengers cannot access the database while administrators retain exclusive rights for database updates.

## Implementing encryption protocols for sensitive user data during transmission and storage.

## Regular security audits and updates to fortify the system against emerging threats and vulnerabilities.

## Requirement attributes

## Multiple administrators will have exclusive rights to modify the system, while members and other users are restricted from making changes.

## The project aims to be open-source in nature.

## Emphasis will be placed on maintaining high-quality database usability for all system users.

## The system installation process will be designed to be user-friendly, allowing for easy downloading and installation.

## Implementing multi-factor authentication for administrator access to enhance login security.

## Regular security assessments and updates to ensure compliance with industry standards and evolving security protocols.

## Business Rules

## Business rules encompass policies and practices guiding system operations. These rules enforce business policies, aid decision-making, and derive new data. This includes regulations regarding project costs and offered discounts. Users must adhere to legal rules and protocols; both administrators and passengers are expected to comply with established regulations and avoid any violations.

## 5.6 User Requirement

## The system users comprise passengers and administrators, where administrators function as the system's primary maintainers. Passengers are expected to possess basic computer and internet browsing skills. Administrators, on the other hand, should have in-depth knowledge to address minor issues resulting from disk crashes, power failures, or other system disruptions. Adequate user interfaces, comprehensive user manuals, online support, and installation guides must be provided to ensure users can utilize the system effortlessly without encountering obstacles.

## The airline-staffs offer specific functionalities to passengers, including:

## Backup and Recovery services.

## Password retrieval mechanisms for forgotten passwords.

## Data migration: Initial user registration data is stored in the server.

## Data replication: Ensuring data redundancy across branches for backup.

## Auto-Recovery: Frequent autosaving of user information.

## Efficient file organization and maintenance.

## Regular maintenance and updates of the server to ensure optimal performance.

## User assistance for flight rescheduling or cancellations.

## Real-time notifications for flight status updates or changes.

* Integration of a feedback mechanism for users to provide reviews or suggestions regarding their booking experiences.

# Other Requirements

## Data and Category Requirement

## Diverse user categories, such as administrators, staff, and passengers, will possess distinct access levels. Administrators retain privileges to modify, delete, and append data, while passengers, excluding certain administrative roles, can primarily retrieve information from the database. The system will feature various flight categories, each showcasing relevant information aligned with their specific category. To ensure efficient management and coding, the data for each flight category will adhere to specific formats within the system.

## Appendix

## A: Admin, Abbreviation, Acronym, Assumptions; B: Books, Business rules; C: Class, Client, Conventions; D: Data requirement, Dependencies; G: GUI; K: Key; L: Library, Librarian; M: Member; N: Non-functional Requirement; O: Operating environment; P: Performance, Perspective, Purpose; R: Requirement, Requirement attributes; S: Safety, Scope, Security, System features; U: User, User class and characteristics, User requirement;

## Glossary

The following are the list of conventions and acronyms used in this document and the project as well:

* Administrator: Represents a user with comprehensive software administration privileges.
* Passenger/User: General login ID designated for most system users.
* Client: The intended users of the airline reservation software.
* SQL (Structured Query Language): Utilized for retrieving information from the database.
* SQL Server: The organized data storage server.
* Layer: Represents specific segments within the project.
* User Interface Layer: The segment involving direct user interactions.
* Application Logic Layer: The Web Server segment handling computational tasks.
* Data Storage Layer: The segment responsible for storing all system data.
* Use Case: An overarching project overview diagram.
* Class Diagram: A static structure diagram illustrating the system's classes, attributes, and relationships.
* Interface: Facilitates communication across different mediums.
* Unique Key: Distinguishes entries within a database.

## Class Diagram

## A class defines an abstract representation of a specific data type, detailing its attributes and allowable operations on instances (i.e., objects) of that data. Each class has a name, a set of defining attributes, and a collection of operations applicable to its instances. The static model depicts the structure and interrelationships of these classes over time. Within this project, several primary classes interrelate with other necessary classes, forming various types of relationships such as normal association, aggregation, and generalization, as portrayed in the diagram. Notably, classes like 'Passenger,' 'Flight,' and 'Booking' stand as pivotal classes, interlinked with other classes essential for system functionality