Software Requirements Specification (SRS) for Online Flight Management System

Student Name: Mphatso Banda
Student ID: SE2023002
College: Lusaka Institute of Technology (LIT)
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1. Introduction

1.1 Document Purpose

This document details the software requirements for the proposed Online Flight Management System (OFMS). Its main objective is to establish a clear understanding between stakeholders regarding the functionalities, performance, and design constraints of the OFMS. This system is envisioned to simplify flight search, booking, and administrative processes, benefiting both travellers and airline operations.

1.2 Scope of the System

The OFMS will cover essential features for flight reservation by passengers and management tools for airline staff. It will handle the entire lifecycle from initial flight inquiry to ticket confirmation, including payment integration and basic administrative oversight. Features outside this scope, such as advanced analytics or complex airline network planning, are not part of this iteration.

1.3 References

- IEEE Standard 830-1998: Recommended Practice for Software Requirements Specifications.

2. Overall System Description

2.1 Product Overview

The OFMS is a web-based application intended to operate independently while allowing for future integration with existing airline databases for real-time information retrieval. It aims to modernize the flight booking experience, making it more efficient and accessible than current manual or fragmented systems.

2.2 User Types

The system is designed to cater to two primary user groups:

- **Individual Travellers (Passengers):** Users looking to book flights, manage their reservations, and access flight information. They are assumed to be competent in

using web applications.

- **Airline Staff (Administrators):** Personnel responsible for managing flight details, passenger records, and system settings. These users will have varying levels of access based on their roles.

2.3 Operating Environment

The OFMS must function correctly across contemporary web browsers (e.g., Chrome, Firefox, Edge, Safari) and be hosted on a reliable cloud infrastructure, ensuring high availability and scalability. Compatibility across different devices (desktop, tablet, mobile) is also a key consideration for the user interface.

2.4 System Constraints

- **Security:** High priority must be given to data security, particularly for personal and payment information. All data transmissions must be encrypted.
- **Interoperability:** The system will require secure interfaces with third-party payment processing services.
- **Compliance:** Adherence to international air travel regulations and data privacy laws is mandatory.

2.5 Assumptions & Dependencies

- **Assumptions:** Stable internet connectivity for all users. Availability of necessary APIs from chosen payment gateways.
- **Dependencies:** A robust and scalable database system for storing flight and user data. Ongoing support from external service providers for integrated functionalities.

3. Detailed System Features

3.1 User Account Management

- **RQ1.1:** The system shall enable new passengers to create an account by providing an email, password, and basic contact information.
- **RQ1.2:** Existing users shall be able to log in securely using their credentials.
- **RQ1.3:** Users must be able to update their personal details within their profile.
- **RQ1.4:** A "forgot password" mechanism shall be available, utilizing the registered email for recovery.

3.2 Flight Information Retrieval

- **RQ2.1:** Users shall be able to search for flights using criteria such as origin, destination, travel dates (one-way or round-trip), and passenger count.
- **RQ2.2:** Search results should clearly present flight details: airline, flight numbers,

timings, duration, number of layovers, and pricing.

- **RQ2.3:** Filters for search results, including price range, specific airlines, number of stops, and preferred times, are required.

3.3 Flight Booking Process

- **RQ3.1:** A user must be able to select a desired flight from the search results.
- **RQ3.2:** The system will prompt for all necessary passenger details for the selected flight.
- **RQ3.3:** Before final confirmation, a summary of the booking details must be presented to the user for review.
- **RQ3.4:** Upon successful booking, a unique booking reference will be generated.

3.4 Financial Transactions

- **RQ4.1:** The system must integrate with secure third-party payment solutions to handle online payments (e.g., credit/debit card transactions).
- **RQ4.2:** Successful payment processing will trigger an immediate update to the booking status.
- **RQ4.3:** An electronic ticket and booking confirmation will be automatically sent to the passenger's registered email post-payment.

3.5 Airline Staff Functions

- **RQ5.1:** Authorized administrative personnel shall have the ability to manage flight schedules (add, edit, delete).
- **RQ5.2:** Staff should be able to view, modify, and cancel passenger bookings as required.
- **RQ5.3:** The system will generate reports on flight bookings, occupancy rates, and revenue for administrative analysis.

4. External Interfaces

4.1 User Interface

The system will feature a web-based, highly interactive GUI. It will be designed for responsiveness, ensuring optimal display and functionality across various devices (desktops, laptops, tablets, smartphones). User experience is paramount, with clear navigation and accessible controls.

4.2 Software Interfaces

- **Payment Gateway API:** Essential for handling all financial transactions securely.
- **Airline Operational API (Planned for Phase 2):** Integration with the airline's internal systems for real-time inventory and pricing updates, aiming for seamless

data exchange.

- **Email Sending Service:** For automated notifications, confirmations, and password resets.

4.3 Communication Interfaces

All communication between the client (user's browser) and the server, especially for sensitive data, will be secured using standard HTTPS protocols.

5. Non-Functional Requirements

5.1 Performance Criteria

- **PNF1:** Flight search results must load within 2.5 seconds for at least 90% of requests.
- **PNF2:** The system should comfortably support up to 60 concurrent users without noticeable performance degradation during peak usage.

5.2 Security Measures

- **SCF1:** All user passwords will be stored using strong hashing algorithms with salting.
- **SCF2:** Access control for administrative functions will be strictly role-based.
- **SCF3:** Sensitive data (e.g., credit card details) will be encrypted both in transit and at rest.
- **SCF4:** Robust session management will be implemented to prevent unauthorized access.

5.3 Reliability

- **RLF1:** The system must achieve 99.6% availability, excluding scheduled maintenance.
- **RLF2:** Data consistency and integrity, particularly for booking and payment records, are critical and will be ensured through transactional safeguards and regular backups.

5.4 Usability

- **USF1:** The interface should be intuitive enough for a first-time user to book a flight within 6 steps from the initial search.
- **USF2:** Error messages will be clear, concise, and provide actionable guidance to the user.

5.5 Scalability

The system architecture will be inherently scalable, designed to handle future growth

in user base and data volume without requiring major architectural overhauls.

5.6 Maintainability

- **MTF1:** The codebase will adhere to industry best practices, making it easy for new developers to understand, maintain, and extend.
- **MTF2:** Deployment of updates and patches should be straightforward and minimize system downtime.