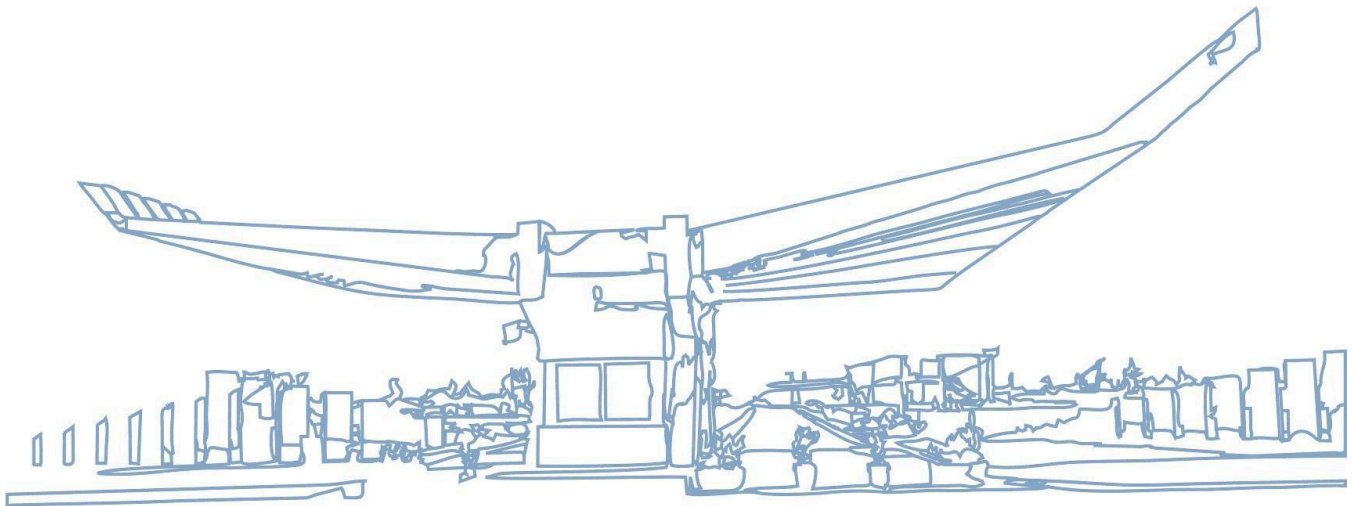


## **Software Project Management**

**[Airline Management System - Shqipe Airline]**



### **Team Members:**

**Alvin Kollcaku**

**Regi Loshi**

**Tea Meraj**

**Maida Daulle**

**Melis Derveni**

**Aleksander Pacani**

**Rexhens Balla**

## **[Shqipe Airline] Requirements Specification**

The Shqipe Airline Management System is a comprehensive software solution designed to optimize airline operations by simplifying flight booking, reservation management, flight tracking, and administrative control. It enhances efficiency for passengers while providing powerful management tools for airline administrators and finance departments. The system integrates secure payment processing, detailed reporting, and effective communication to ensure a seamless and reliable user experience.

## **Table of Contents**

<b>1. EXECUTIVE SUMMARY</b>	<b>3</b>
1.1 PROJECT OVERVIEW	3
1.2 PURPOSE AND SCOPE OF THIS SPECIFICATION	3
<b>2. PRODUCT/SERVICE DESCRIPTION</b>	<b>3</b>
2.1 PRODUCT CONTEXT	3
2.2 USER CHARACTERISTICS	3
2.3 ASSUMPTIONS	3
2.4 CONSTRAINTS	3
2.5 DEPENDENCIES	4
<b>3. REQUIREMENTS</b>	<b>4</b>
3.1 FUNCTIONAL REQUIREMENTS	5
3.2 NON-FUNCTIONAL REQUIREMENTS	5

## ***1. Executive Summary***

### ***1.1 Project Overview***

This project focuses on developing an advanced airline ticket booking system that enhances the flight booking experience for passengers. The system is designed to facilitate seamless booking, secure transactions, comprehensive reporting, and effective communication, ensuring a smooth and efficient process for users.

#### **Intended Audience**

The intended audience for this software includes:

- ***Passengers:*** Individuals who need to search for flights, book tickets, manage their bookings, and provide feedback on their flight experiences.
- ***Administrators:*** Airline staff responsible for managing user accounts, including account creation, modification, deletion, password resets, and role/permission management.
- ***Finance Department:*** Team members who require access to detailed revenue performance reports, with the ability to visualize data through charts, graphs, and tables.
- ***Flight Planners:*** Air control department personnel who manage flight schedules, including creating, modifying, and deleting flights, as well as updating flight details.

### ***1.2 Purpose and Scope of this Specification***

#### **Purpose**

The purpose of this specification is to detail the functional and technical requirements for the development of our airline ticket booking software. This document aims to provide a clear and comprehensive guide for everyone involved in the project, ensuring that all parties understand the scope and limitations of the project.

#### **Scope**

##### ***In Scope***

This document addresses requirements related to the development of the airline ticket booking software, specifically:

**Passenger Services:**

- Account creation and login.
- Flight search, booking, and management.
- Payment processing and feedback system.

**User Registration and Authentication:**

- Secure account management for passengers.
- Administrative controls for managing user accounts.

**Finance Department:**

- Access to revenue performance reports.
- Data visualization tools for revenue analysis.

**Flight Planning:**

- Creation, modification, and deletion of flights.
- Management of flight details including coordinates, aircraft information, and routes.

**Management and Reporting:**

- Oversight of user accounts and system performance.
- Generation of reports and analytics for flight bookings.

**Customer Support and Communication:**

- Provision of customer support via multiple channels.
- Notifications for booking confirmations, changes, and cancellations.

***Out of Scope***

The following items are outside the scope of these specifications:

**Future Phases of Development:**

- Any enhancements or modifications planned for future phases of the project, beyond the initial deployment.

- Requirements related to the integration with third-party systems or services that are not part of the current phase.
- Modifications related to future legislative mandates not covered in the current phase.

These out-of-scope items will be considered in the planning of future phases, but their requirements will be documented separately and addressed in subsequent development cycles.

## ***2. Product/Service Description***

### **Background Information**

The airline ticket booking software is designed to address the evolving needs of the airline industry and its customers. As the travel industry becomes increasingly digitized, there is a growing demand for efficient, user-friendly, and secure booking solutions. This software aims to enhance the travel experience for passengers while providing robust management tools for airline staff and departments. The following factors influence the product and its requirements:

#### **A. User Experience:**

- **Ease of Use:** Passengers expect a seamless and intuitive booking process. A user-friendly interface that simplifies flight searches, bookings, and payments is essential to meet customer expectations and enhance satisfaction.
- **Accessibility:** The software must be accessible across various devices, including desktops, tablets, and smartphones, to cater to a broad audience.

#### **B. Security:**

- **Data Protection:** With the increasing risk of cyber threats, safeguarding personal and payment information is crucial. The software must implement robust security measures to protect user data and ensure compliance with data protection regulations.
- **Authentication:** Secure user authentication processes are necessary to prevent unauthorized access and ensure the integrity of user accounts.

### **C. Real-Time Information:**

- **Flight Availability and Pricing:** Providing real-time data on flight availability, pricing, and seat options is vital for passengers to make informed decisions. This requires integration with airline databases and real-time data feeds.
- **Dynamic Updates:** The software should handle dynamic updates, such as changes in flight schedules or prices, to ensure users have the most current information.

### **D. Operational Efficiency:**

- **Administrative Control:** Airline staff need effective tools to manage user accounts, reservations, and flight details. This includes functionalities for creating, modifying, and deleting accounts and flights, as well as handling special requests and changes.
- **Financial Reporting:** The finance department requires detailed revenue reports and data visualization tools to monitor and analyze financial performance. This helps in making informed business decisions and identifying trends.

### **E. Regulatory Compliance:**

- **Legislative Requirements:** The software must comply with industry regulations and standards, such as data protection laws and aviation regulations. This ensures the system operates within legal frameworks and avoids penalties.
- **Accessibility Standards:** Compliance with accessibility standards ensures the software is usable by people with disabilities, broadening its user base and adhering to legal requirements.

### **F. Customer Support:**

- **Multi-Channel Support:** Providing customer support through various channels, including phone, and email is essential for addressing passenger inquiries and issues promptly.
- **Notification System:** Automated notifications for booking confirmations, changes, and cancellations help keep passengers informed and reduce the likelihood of miscommunication.

## **Reasons for Specific Requirements**

The aforementioned factors directly influence the specific requirements detailed later in the specification. For instance, the need for a user-friendly interface drives the requirement for comprehensive search and booking functionalities. Security considerations necessitate robust authentication mechanisms and data

protection measures. Real-time information requirements lead to the integration of dynamic data feeds and updates. Operational efficiency and regulatory compliance shape the administrative and reporting features, while customer support needs influence the communication tools and notification systems.

By understanding these general factors, stakeholders can appreciate the rationale behind each requirement, ensuring the final product aligns with industry demands and user expectations.

## ***2.1 Product Context***

### **Independence and Self-Contained Nature**

The airline ticket booking software can function as an independent, self-contained system with its primary purpose being to facilitate the booking of airline tickets for passengers.

### **Interfacing with Related Systems**

While the core functionality of the software is self-contained, it often needs to interface with a variety of related systems to provide a comprehensive service. These relationships include:

#### **Payment Gateways**

- **Description:** Integration with payment processing services like PayPal, Stripe, or direct credit card processors.
- **Function:** Enables secure and efficient handling of payments, supporting multiple currencies and payment methods.

#### **Customer Relationship Management (CRM) Systems**

- **Description:** Linking with CRM systems to manage customer data, preferences, and communication.
- **Function:** Helps in personalizing the booking experience, managing customer inquiries, and marketing activities.

#### **Travel Management Systems**

- **Description:** Some users, especially business travelers, may use travel management systems like Concur or Egencia.



- **Function:** Integrates booking details with expense management and corporate travel policies, ensuring compliance and streamlining reporting.

## Alert Systems

- **Description:** Integration with alert systems for communication.
- **Function:** Sends alerts for booking confirmations, flight status updates, and check-in reminders.

## Security and Compliance Systems

- **Description:** Connecting with systems for data security, fraud detection, and regulatory compliance.
- **Function:** Ensures the software adheres to industry standards and protects user data.

## 2.2 *User Characteristics*

### Staff

- **Experience:**
  - Moderate experience with booking flights, typically for business travel.
  - Familiar with corporate travel policies and budget constraints.
- **Technical Expertise:**
  - Comfortable with using computers and mobile devices for booking travel.
  - Generally prefer user-friendly interfaces with some support for complex bookings.
- **Other General Characteristics:**
  - Interested in cost-effective options.
  - Value clear policies on changes and cancellations.
  - Require detailed invoicing and receipts for reimbursement purposes.
  - Often need assistance with group bookings and coordination for team travel.

### Leisure Travelers

- **Experience:**
  - Wide range of experience, from occasional travelers to frequent vacationers.
  - Typically book flights for vacations, family visits, and personal trips.

- **Technical Expertise:**
  - Varies from novice to proficient with online booking platforms.
  - Comfortable with using both websites and mobile apps.
- **Other General Characteristics:**
  - Budget-conscious, looking for deals and special offers.
  - Flexible with travel dates to find better deals.
  - Prefer easy-to-navigate interfaces and straightforward booking processes.

### **Business Travelers (Non-Staff)**

- **Experience:**
  - High experience with frequent travel for business purposes.
  - Focus on efficiency and convenience in booking travel.
- **Technical Expertise:**
  - Proficient with using technology for booking flights and managing itineraries.
  - Often use travel management apps and software.
- **Other General Characteristics:**
  - Prioritize efficiency, reliability, and convenience.
  - Interested in options that offer flexibility and ease of booking.
  - Require flexible booking policies and easy management of bookings.
  - Value quick support for changes and cancellations.

## **2.3 Assumptions**

### **Assumptions Affecting Requirements**

#### **Equipment Availability**

- **Assumption:** Users have access to modern computers, tablets, or smartphones.
- **Impact:** The system must be compatible with multiple device types and screen sizes.
- **Change Needed if Unavailable:** The system would need a simplified version for older or less capable devices.

## Operating System

- **Assumption:** Users are using up-to-date versions of major operating systems (Windows, macOS, iOS, Android).
- **Impact:** The software should be compatible with the latest and several previous versions of these operating systems.
- **Change Needed if Unavailable:** Broader compatibility testing and support for older operating system versions would be required.

## Internet Access

- **Assumption:** Users have reliable internet access.
- **Impact:** The system can be primarily web-based, requiring constant internet connectivity.
- **Change Needed if Unavailable:** Offline capabilities or downloadable versions of the system might need to be developed.

## Browser Compatibility

- **Assumption:** Users have access to and use modern web browsers (Chrome, Firefox, Safari, Edge).
- **Impact:** The system should be tested and optimized for these browsers.
- **Change Needed if Unavailable:** Additional support for older or less common browsers would be required.

## Technical Expertise

- **Assumption:** Users have a basic level of technical expertise and can navigate web applications.
- **Impact:** The user interface should be intuitive and user-friendly, but it can assume a baseline understanding of web usage.

- **Change Needed if Unavailable:** Additional user training resources, tutorials, or a simplified interface would be necessary.

### **Payment Methods**

- **Assumption:** Users have access to common online payment methods (credit/debit cards, digital wallets like PayPal).
- **Impact:** The system can integrate standard payment gateways.
- **Change Needed if Unavailable:** Support for alternative payment methods or manual payment processes would be required.

### **Security Standards**

- **Assumption:** The system will comply with standard security protocols (SSL/TLS, PCI-DSS for payments).
- **Impact:** Ensures user data protection and secure transactions.
- **Change Needed if Unavailable:** Development of custom security measures or additional compliance checks.

### **Regulatory Compliance**

- **Assumption:** The system adheres to relevant aviation and data protection regulations (GDPR, CCPA, etc.).
- **Impact:** Ensures legal compliance and user trust.
- **Change Needed if Unavailable:** Significant modifications to data handling, storage, and user consent processes.

## **2.4 Constraints**

## **2.5 Dependencies**

### ***3. Requirements***

#### ***3.1 Functional Requirements***

***Passenger/User*** - A passenger is a customer who books and manages flights.

##### ***Authentication & Account Management***

- **Log in / Sign up:** Allows users to access or register their accounts.
- **Two-factor authentication (2FA) for enhanced security:** Adds an extra layer of protection for account access.
- **Profile management (edit details, change password, update payment methods):** Lets users update personal information and preferences.
- **Reset password via email or SMS :** Provides a secure method for recovering lost passwords.

##### ***Flight Booking & Management***

- **Search for flights by date, destination, airline, and price:** Allows passengers to find flights based on their preferences and budget.
- **Book flights :** Enables passengers to select seats, customize meal options, and add extra baggage for an additional fee.
- **Apply for travel insurance**
- **View ticket details and status (confirmed, pending, canceled):** Provides access to booking details and current ticket status.
- **Cancel or reschedule flights with refund policy details:** Allows passengers to modify or cancel bookings while viewing applicable refund policies.
- **Receive real-time flight status notifications (delays, gate changes, etc.):** Sends timely alerts regarding flight changes, delays, and gate updates.
- **View baggage policies and restrictions:** Displays airline-specific baggage rules and limitations.

##### ***Payments & Transactions***

- **Secure payment processing (possibly credit/debit cards, PayPal):** This feature ensures that users can securely make payments using credit/debit cards or PayPal, with encrypted transactions for safety.

- **Save payment methods for future use:** Users can securely save their payment methods for future transactions, streamlining checkout processes for convenience.
- **View and download invoices, receipts, and e-tickets:** Users can access and download invoices, receipts, and e-tickets for past transactions, making it easy to keep track of their purchases.
- **Apply discount codes:** Customers can apply valid discount codes during checkout to receive promotions, such as a percentage off or free shipping.

### *Flight & Travel History*

- **View past flight history and upcoming flights:** Users can easily access their past flight details and upcoming flight schedules for better travel planning.
- **Download boarding passes:** Passengers can download and store their boarding passes directly from the platform for quick access during travel.
- **Store emergency contact details:** Users can securely store their emergency contact information, ensuring it's easily accessible in case of travel-related emergencies.

### *Customer Service & Feedback*

- **Submit feedback and rate flight experience:** Passengers can submit feedback and rate their flight experience to help airlines improve their services.
- **Request special assistance (wheelchair, medical, baby support):** Travelers can easily request special assistance, such as wheelchair support, medical aid, or assistance for babies, to ensure a smooth journey.
- **Whatsapp redirect:** Users can be redirected to customer service via WhatsApp for quick and convenient support during their travel experience.

### *Additional Features*

- **Book hotels and rental cars through integrations:** Users can book hotels and rental cars directly through integrated services, offering a seamless travel experience.
- **Access lounge services (if eligible):** Eligible passengers can access exclusive airport lounge services, providing a more comfortable and relaxing pre-flight experience.

### *Mini shop*

- **In-flight shopping (pre-order, duty-free items):** Passengers can pre-order duty-free items for in-flight delivery, enhancing their shopping experience during the flight.
- **Browse and purchase items like snacks, electronics, souvenirs:** Travelers can browse and purchase a variety of in-flight items, such as snacks, electronics, and souvenirs, for added convenience.
- **Digital receipts and transaction tracking:** Users receive digital receipts and can track their transactions, making it easy to keep a record of their in-flight purchases.

### *Job application*

- **Upload resume and necessary documents:** Candidates can apply for jobs by uploading their resume and necessary documents directly through the platform.

*Admin* - The admin oversees the entire airline management system.

### *User & Account Management*

- **Approve/reject new user registrations:** The admin has the authority to approve or reject new user registrations based on predefined criteria.
- **Manage user roles and permissions:** The admin can assign and modify user roles and permissions, controlling access to different parts of the system.
- **Block, suspend or delete user accounts:** The admin can block, suspend, or delete user accounts in response to policy violations or other issues.
- **Audit login history and user activity**

### *System Monitoring & Reporting*

- **Access detailed reports:**
  - **Flight reports (delays, cancellations, trends)**
  - **Financial reports (revenue, losses, expenses)**

### *Job application*

- **Publishes job application form and accesses applications:** The admin publishes job application forms and accesses submitted applications to manage recruitment processes.

*Air Control Department* - This department is responsible for managing flights and air traffic.

### *Flight Management*

- **Add, modify, and cancel flights:** The department has the authority to schedule new flights, adjust existing ones, or cancel flights when necessary.
- **Assign flight numbers, routes, and schedules:** The department assigns appropriate flight numbers, routes, and flight schedules to ensure optimal operations and efficiency.
- **Update flight capacity and available seats:** The department is responsible for managing the flight capacity and ensuring accurate availability of seats for passengers.

### *Data & Backup Management*

- **Integrate flight plan data with air traffic control systems:** The department ensures that flight plans are seamlessly integrated with air traffic control systems to manage safe and efficient airspace operations.

### *System Integration*

- **Connect with weather data systems for real-time updates:** The department connects with weather data systems to receive real-time updates on weather conditions, helping adjust flight plans as needed.

### *Staff for flight*

- **Manages the information for the staff of the flights:** The department manages the information for flight staff, including pilots, crew members, and ground staff, to ensure smooth operations for each flight.



***Finance Department*** - The Finance Department handles all financial aspects of the airline.

#### ***Financial Management***

- **Authenticate and access financial data securely:** The department ensures that all financial data is authenticated and accessed securely, maintaining data privacy and integrity.
- **Generate financial reports (profit/loss, revenue, tax reports)**
- **Monitor payment processing and refunds**
- **Manage airline's pricing strategies and dynamic fare adjustments**

#### ***Expense & Revenue Monitoring***

- **Track operational expenses (fuel costs, airport fees, salaries)**
- **Ensure tax compliance**

#### ***Billing & Invoicing***

- **Manage refunds:** The department processes and manages customer refunds, ensuring that refund requests are handled promptly and accurately.
- **Generate financial forecasts for business planning**

#### ***Mini shop***

- **Handles mini shop:** The department handles financial management for the mini shop, including tracking sales, managing inventory, and ensuring profitability.

### ***3.2 Non-Functional Requirements***

#### **Performance Requirements**

- The system should be able to handle at least 1000 concurrent users without performance degradation.
- Flight search results should be displayed within 3 seconds after user input.
- Payment processing should be completed within 5 seconds for a seamless user experience.

## **Security Requirements**

- Data encryption must be applied to all sensitive information (passwords, payment details).
- The system must implement role-based access control (RBAC) to restrict staff permissions.
- Two-factor authentication (2FA) should be mandatory for both passengers and admin users.
- Implement automatic session timeouts for idle users after 10 minutes.

## **Usability Requirements**

- A clear and intuitive user interface (UI) with minimal learning curve should be provided.

## **Reliability & Availability**

- Regular database backups (every 24 hours) to prevent data loss.

## **Maintainability & Support**

- Support for API integrations with third-party services like payment gateways and hotel booking platforms.

## **Compliance & Legal Requirements**

- The system should comply with aviation regulations from organizations like IATA and FAA.
- Secure handling of financial transactions as per PCI-DSS requirements.
- User data privacy should be maintained as per GDPR and CCPA.

## **Backup & Disaster Recovery**

- Redundant database storage to prevent critical data loss.

## **Interoperability**

- The system should be able to integrate with third-party services such as:
  - Payment gateways (Visa, MasterCard, PayPal)
  - Weather forecasting APIs
- Standardized APIs should be provided for future expansion.