# R#1: Business and System Requirements Specification

This document outlines the first deliverable (R#1) for the Airline Reservation System project. It defines the key stakeholders, their functional requirements, and the overarching system requirements.

## 1. Defined Stakeholders

Stakeholders are categorized based on their relationship to the system.

### 1.1. User Stakeholders

These are the actors who will directly interact with the system's GUI.

* **Passenger (User):** The end-user who books and manages flights.
* **Airline Administrator (User):** The back-office user responsible for managing flight inventory, running reports, and assisting passengers.

### 1.2. Business Stakeholders

This stakeholder represents the business interests and drivers for the project.

* **Airline Management:** This non-user stakeholder is concerned with the system's output for business intelligence, such as revenue reports, flight occupancy, and booking statuses, to make strategic decisions.

### 1.3. External System Stakeholders

These are external systems that our system must interface with.

* **Payment Gateway:** This external system is responsible for processing all financial transactions. It imposes requirements on our system to handle payment authorization, status updates (e.g., "Approved," "Failed"), and transaction tracking.

## 2. Stakeholder Functional Requirements

This section provides a detailed breakdown of functional requirements for the *User Stakeholders*.

### 2.1. Passenger Requirements

This stakeholder's requirements are focused on the search, booking, and management of their travel.

The Passenger stakeholder requires the ability to:

* **Register:** Create a new account with personal details (name, email, phone) to manage bookings.
* **Manage Profile:** View and update personal information to ensure accuracy.
* **Search Flights:** Search for available flights based on destination and travel dates.
* **View Flight Details:** View flight details (origin, destination, departure/arrival times, available seats) to make informed decisions.
* **Book Flight:** Book a selected flight, including seat assignment.
* **Receive Confirmation:** Receive a booking confirmation after a successful booking.
* **Manage Booking:** Cancel an existing reservation or update a seat assignment.
* **Process Payment:** Process payments for bookings using various methods and receive a receipt.
* **Track Flight Status:** Check the status of a flight (e.g., scheduled, delayed, canceled).

### 2.2. Airline Administrator Requirements

This stakeholder's requirements are focused on managing flight inventory and monitoring system performance.

The Airline Administrator stakeholder requires the ability to:

* **Manage Flights:** Add new flights with all details (origin, destination, times, seat counts).
* **Update Flights:** Update or cancel existing flight details.
* **Manage Bookings:** View and manage passenger bookings (e.g., cancel a reservation on behalf of a customer).
* **Monitor Flight Status:** Check and update a flight's status (e.g., scheduled, delayed, canceled, departed).
* **Monitor Seat Availability:** Track the number of available seats for all flights in real-time.
* **Generate Reports:** Generate reports on key business metrics (e.g., flight occupancy, booking status, revenue) for Airline Management.

## 3. System Requirements (Non-Functional & Advanced)

This section lists the non-functional and advanced requirements the system must fulfill, as specified in the project description.

### 3.1. Non-Functional Requirements

* **Reliability:** Maintain real-time seat availability to prevent overbooking.
* **Security:** Encrypt sensitive data, such as payment details and passenger information.
* **Performance:** Return flight search results in less than 3 seconds.
* **Scalability:** Handle a large number of simultaneous bookings and queries.
* **Availability:** Maintain 99.9% uptime for booking and flight management functions.

### 3.2. Advanced Feature Requirements

* **Status Automation:** The system must automatically update a flight's status when its departure time passes (to be implemented via a trigger).
* **Query Efficiency:** The system must utilize indexes to ensure fast queries on flight availability.
* **Process Efficiency:** The system must employ stored procedures for efficient booking management and payment processing.