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**STAKEHOLDERS**

Passengers: These are the primary users of the system. Passengers use the system to search for flights, book tickets, check flight details, and manage their reservations.

Airline Staff: This includes the airline's employees who use the system to manage flight schedules, ticketing, and passenger information. They may include reservation agents, ticketing agents, and flight attendants.

Administrators: System administrators are responsible for the maintenance, security, and overall management of the system. They handle user accounts, database management, and ensure the system is functioning correctly.

Airline Management: This group includes higher-level executives and managers who use the system for decision-making, such as analyzing booking trends, monitoring revenue, and managing flight schedules.

IT Department: The IT department is responsible for the technical aspects of the system, including software development, server maintenance, and system updates.

Regulatory Authorities: Airlines are subject to various regulations and may need to provide information to regulatory authorities. These authorities may need access to the system for oversight and compliance.

Third-Party Vendors: If the airline management system integrates with third-party services (e.g., payment processors, booking engines, or data providers), these vendors are stakeholders as their services affect the system's functionality.

Marketing and Sales Teams: These teams use the system to promote flight offers, manage discounts, and analyze customer behavior to tailor marketing strategies.

Travel Agencies: If the airline collaborates with travel agencies, they might have access to the system to book flights on behalf of their clients.

Passenger Support and Customer Service: These teams use the system to assist passengers with booking, cancellations, and addressing issues or complaints.

Security Auditors: In the context of data security and compliance, security auditors may periodically assess the system to ensure it meets industry standards and is protected against security breaches.

Financial Departments: The finance team uses the system to track revenue, manage billing, and ensure financial transactions are accurate.

Competitors: Competing airlines may monitor the system to stay informed about pricing, flight schedules, and other competitive factors.

Investors and Shareholders: Individuals or organizations who have invested in the airline may be interested in how the system impacts the company's financial performance.

Government and Law Enforcement: In cases of security or legal issues, government agencies and law enforcement may need access to the system's data and records.

**USE CASE MODEL**

For the Airline Management System there are primarily two Users (Actors), the Passenger, which can search for flights etc. and the Administrator which manages the flights and Bookings etc. For each one we have different Use Cases :

**Passenger Use Cases:**

* Search Flights:

--As a passenger i can search for available flights based on criteria such as departure city, destination, date, and other preferences so I can book a flight.

--Textual Description: The passenger provides search criteria, the system retrieves a list of available flights and the passenger views the list of flights.

--Breakdown:

* As a passenger I can enter my desired departure and arrival destinations by typing in the corresponding box
* As a passenger I can enter the date that I want to fly , via clicking on the desired date in the calendar picker.
* As a passenger based on these search terms , I will be able to see a list of all the available flights that meets those search terms
* Book Flight:

--As a passenger I can book a flight by selecting a flight from the list, you have to provide personal information and payment details, so the system can confirm the booking and issue a ticket.

--Textual Description: The passenger selects a flight from the list, insert its personal information and payment details, the system retrieves the information and books the flight , sending feedback later on.

--Breakdown:

* Cancel Reservation:

--As a passenger i can cancel an existing flight reservation by logging into my account, then select the reservation to cancel , so that the system will cancel the reservation and process any refunds.

--Textual Description: The passenger can cancel the existing flight he/she booked , and the system will return refunds.

* Login/Signup:

--As a passenger, I can log in or sign up to the system , so that I can continue to search/book/cancel flights in the webpage.

--Textual Description: The passenger will select the menu button on the top of the page, he/she will have choices of Log in/Sign up, depends on the current situation of the passenger he/she will choose on of the two too continue.

* Edit Profile:

--As a passenger , I can edit my profile , so I can improve security reasons for the safety of my account( Password, Email etc.)

--Textual Description: The passenger can change its password for security reasons, the Email for personal reasons and generally change personal information for its safety.

**Administrator Use Cases:**

* Log in as an Administrator:

--As an Administrator, I can login into the system with a different objective than the passenger, so I can manage bookings , manage passengers status etc.

* Manage Bookings:

--As an administrator, I can manage passenger bookings and reservation statuses by logging into the system, then can view a list of passenger bookings , so later on i can update reservation statuses (e.g., confirm, cancel, modify).

--Textual Description: The administrator will press the “manage bookings” button , a list of passenger bookings will appear , and then the administrator can start modifying.

* Update Flight Information:

-- As an administrator, I can choose to update flight details, such as schedules, availability, and pricing for passengers , so that any mistakes will prevented.

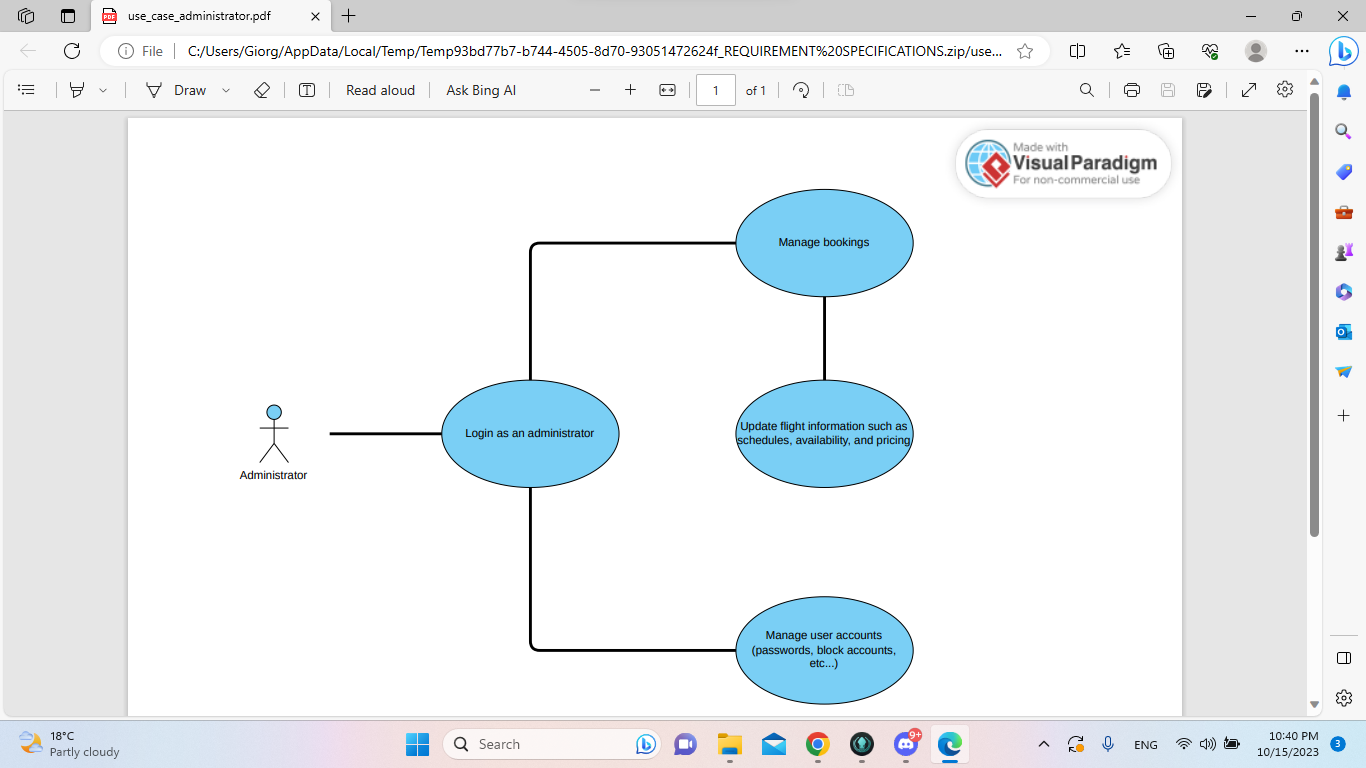
--Textual Description: The administrator will select to update existing flights of passengers based on criteria such as schedules, availability and pricing , if the passenger made a request for changes.

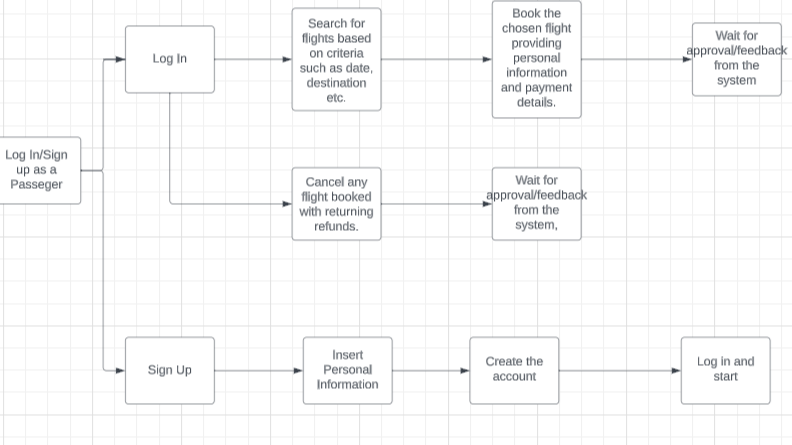
* Manage User Accounts:

-- As an administrator ,i can manage passenger user accounts ,so I can change its personal information for security reasons or block a passenger if necessary (e.g., reset passwords, block accounts).

--Textual Description: The administrator can manage passenger accounts by changing personal information or blocking them from the system.

**GRAPHIC USE CASE MODEL**



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**RATIONALE**

* User-Centered Design:

The use case model is designed with a focus on the primary system users: passengers and administrators. Passengers can efficiently book flights, view flight availability, and cancel reservations, which enhances the user experience and reduces the need for offline booking counters.

* Efficient Booking Process:

Passengers can book flights online, reducing the need for physical visits to booking counters. This is not only convenient for passengers but also cost-effective for airlines, as it streamlines the booking process.

* Flexibility and Accessibility:

The system is designed to be accessible from any location at any time, which aligns with modern passenger expectations. Passengers can view flight availability and make bookings whenever they want, enhancing the flexibility of the system.

* Administrator Control:

The "Manage Booking " use case provides administrators with control over the system's core functionalities, such as flight availability and reservation management. This enables airlines to adapt to changing circumstances and efficiently allocate resources.

* Feedback Loop:

While not explicitly shown in the model, the system can incorporate a feedback loop where passengers can provide feedback on their experiences. This information can be used to continuously improve the system and the overall quality of service.

* Cost Savings and Operational Efficiency:

By reducing the need for offline booking counters, the system contributes to cost savings and enhances operational efficiency for the airline.

* Scalability:

The use case model is adaptable and scalable. As the airline business evolves and grows, additional use cases can be integrated into the system to meet new requirements without significantly altering the existing structure.

**NON-FUNCTIONAL REQUIREMENTS**

Performance:

* The system must support a minimum of 1000 concurrent users during peak hours.
* Response time for flight availability queries should be under 2 seconds.
* The system should handle at least 99% of transactions without errors.

Availability:

* The system should be available 24/7, with scheduled maintenance periods minimized.
* Availability should be at least 99.9%.

Reliability:

* The system should have a mean time between failures (MTBF) of at least 10,000 hours.
* In case of system failure, data integrity must be maintained, and transactions in progress should not be lost.

Security:

* User data and financial information must be encrypted and stored securely.
* Authentication and authorization mechanisms should be in place to prevent unauthorized access.
* The system should comply with industry security standards and regulations (e.g., GDPR, PCI DSS).

Scalability:

* The system must be scalable to accommodate increasing numbers of users and flights.
* Scalability should be achieved both horizontally and vertically.

Usability:

* The user interface should be intuitive and user-friendly to cater to users with various levels of technical expertise.
* Accessibility standards should be followed to ensure that the system can be used by individuals with disabilities.

Compatibility:

* The system should be compatible with a wide range of web browsers and devices.
* It should work on different operating systems.

Maintainability:

* The system should be easily maintainable, with the ability to update and patch software without significant downtime.
* Documentation for administrators and developers should be comprehensive.

Compliance:

* The system must adhere to aviation industry regulations and standards.
* It should also comply with data protection and privacy laws, such as GDPR.

Auditability:

* There should be a robust logging and audit trail system to track all user and administrator activities.
* The logs should be securely stored and tamper-evident.

Interoperability:

* The system should integrate with other airline systems, such as reservation systems, payment gateways, and flight tracking systems.

Data Backup and Recovery:

* Regular data backups must be performed, and there should be a disaster recovery plan in place to restore the system in case of data loss or catastrophic events.

Load Testing:

* Regular load testing should be conducted to ensure the system can handle the expected volume of transactions and users.

Geographic and Time Zone Considerations:

* The system should support different time zones, especially for international flights.
* It should provide localized content and language options for users in different regions.

Cost-effectiveness:

* The system should be cost-effective to develop, maintain, and operate, without incurring unnecessary expenses.