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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 is provided with the search criteria (textbox, calendar etc.) and after inserting his/her preferences , the system shows a list of available flights based on the criteria and the passenger can continue to the next stage.

--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 I will be able to see a list of all the available flights based on the search terms provided.

A diagram of a flight schedule

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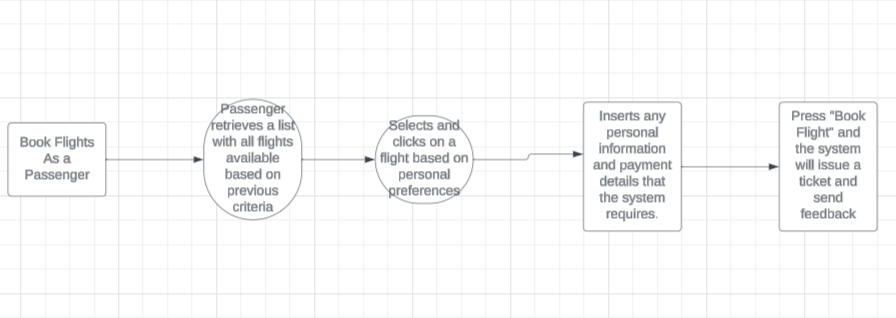
* Book Flights:

--As a passenger, I can book a flight by selecting a flight from the list, after providing my 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 , issue a ticket and send feedback later on.

--Breakdown:

* As a passenger I will retrieve a list of flights based on the previous information that I provided.
* As a passenger I will have to select a flight based on my personal preferences and click on it.
* As a passenger I have to insert any personal information and payment details that the system requires to process.
* As a passenger I can click on the button saying “Book Flight” and the system will retrieve the information issue a ticket and send feedback later on.



* Cancel Reservation/Flight:

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

--Textual Description: The passenger will log in via its account ,select the menu tab/button , click on flights to cancel , find the flight he/she wants to cancel click on it and proceed.

--Breakdown:

* As a passenger I will be able to find the menu tab/button on the top of the screen and click on it.
* As a passenger I will be able to see the button for the cancellation of the flights and click on it to proceed.
* As a passenger I will be provided with a list of my booked flights.
* As a passenger I will have to click on the flight I want and cancel it by clicking on the button cancel flight.
* The system will get notified and proceed with the cancellation , with returning refunds and feedback information.

A diagram of a flight

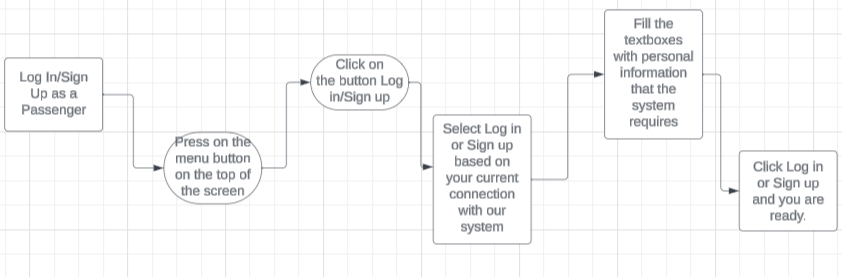
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* Login/Signup:

--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 system.

--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 one of the two, then the passenger will have to provide any personal information required for the system to process.

--Breakdown:

* As a passenger when I am at the home screen I will be able to see the menu tab/button on the top of the screen and click on it.
* As a passenger after clicking on the menu button I will be able to see the Log In/Sign up button ,click on it.
* As a passenger I will be provided with an interface with multiple textboxes that I must fill up.
* As a passenger before I fill up the textboxes , based on my current situation I have to press on the top , either “Log in” if I already have an account, but if not I will have to press “Sign up” to create an account.
* As a passenger then I fill up any personal information that the system requires to proceed and then press Log in/Sign up.
* Edit Profile:

--As a passenger , I can edit my profile changing passwords/emails etc., so I can improve the security safety of my account( Password, Email ,Username/Surname etc.)

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

--Breakdown:

* As a passenger I will have to press on the menu button on the top of the screen.
* As a passenger I will be able to see the button to change any personal information and click on it .
* As a passenger I will be provided with a list of my personal information in textboxes.
* As a passenger by pressing on the textboxes I can edit any personal information I want(Passwords, Emails, Username, Surname etc.)
* As a passenger after any changes I made I will have to press on the button save changes so don’t lose any change I made.

A diagram with text and images

Description automatically generated with medium confidence

**Administrator Use Cases:**

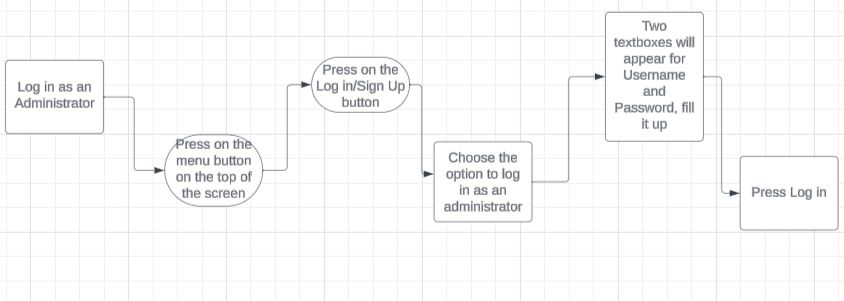
* Log in as an Administrator:

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

--Textual Description: The Administrator , when he/she is on the home screen he will have to press on the menu button on the top of the screen , then press Log in/Sign up , then there will be an option available to log in as an administrator and after clicking on it two textboxes will appear , one for the Username and one for the password and log in, this information only the administrator will be able to know.(Username, Password).

--Breakdown:

* As an administrator I will have to press on the menu tab/button on the top of the screen.
* As an administrator I will have to press on the Log in/Sign Up button to proceed.
* As an administrator later on I will be able to press on the button saying log in as an administrator and click on it.
* As an administrator I will be provided with two textboxes, one for the Username and one for the Password.
* As an administrator I will have to insert he corresponding details that have given to me and press log in.



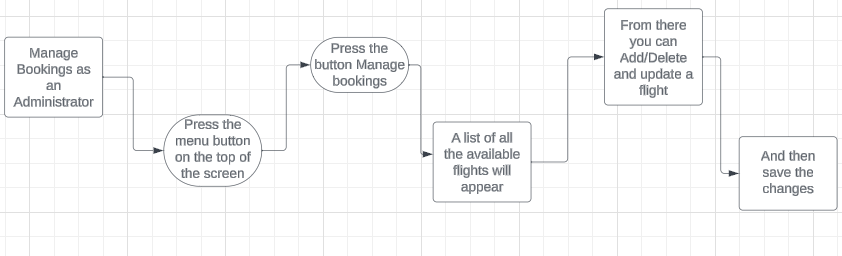
* Manage Bookings:

--As an administrator, I can manage passenger bookings and reservation statuses by logging into the system, so I can later on delete , add or modify any flight.

--Textual Description: The administrator will press the menu button on the top of the screen , then press the button manage bookings and he/she will be provided with the list of all flights, so if any flight has been cancelled or its hour has changed , or a new one is announced , he can proceed to delete , add or modify later on by clicking on the buttons, delete a flight, add a flight, update a flight etc.

--Breakdown:

* As an administrator I will press the menu button , and then the manage flights button.
* As an administrator I will be provided with the list of all flights available.
* As an administrator I will have to press on the button delete a flight , if a flight has been cancelled
* As an administrator I will have to press on the button add a flight, if a new flight is announced
* As an administrator I will have to press on the button update flight, if I want to change any flight information such as destinations, timelines, stops etc.
* As an administrator after modifying any flight I have to press save changes so that any process I made will be saved.



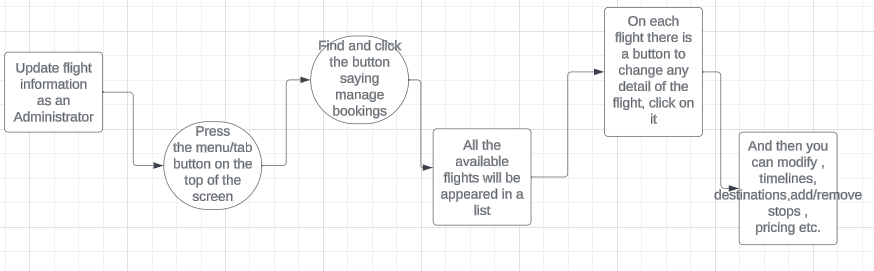
* Update Flight Information:

-- As an administrator, I can choose to update flight details, such as schedules, timelines, add/remove stops ,availability, and pricing for passengers , so I can prevent any mistakes.

--Textual Description: The administrator will press on the menu button on the top of the screen then press on the manage flights button and he/she will be provided with all the available flights. A button will be available to press that is saying update flight on each flight pressing the one he/she wants to modify, from there the administrator can see timelines to change, add/remove stops, change pricing , change destinations etc.

--Breakdown:

* As an administrator I will press on the menu button and then the manage flights button.
* As an administrator I will see all the flights available.
* As an administrator I will be able to see the button for the update of flights , on each flight.
* As an administrator I will choose the flight I want to modify
* As an administrator I will see all the requirements I can change for the flight (Prices, Timelines, Add/remove stops, change destinations etc.) and proceed to modify.



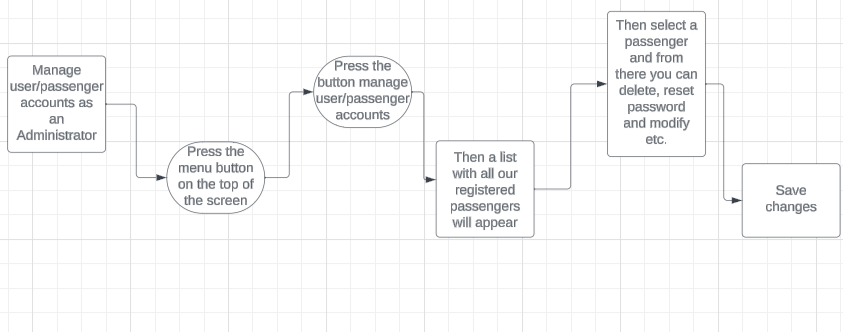
* Manage User Accounts:

-- 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/delete/add accounts etc.).

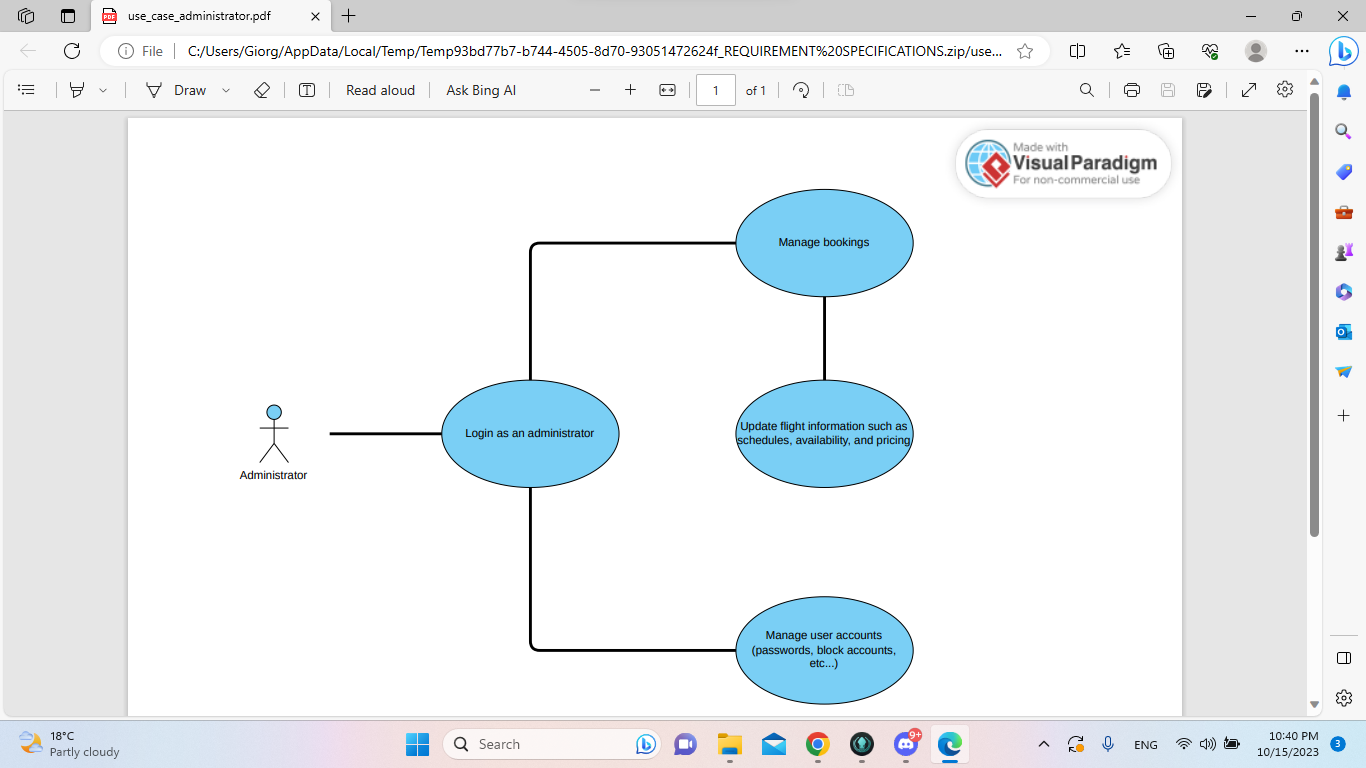
--Textual Description: The administrator will press on the menu button , then find the button saying manage passenger accounts and click on it and all the accounts registered will be shown in a list, and from there he/she can select a profile by clicking on it and delete or change any information.

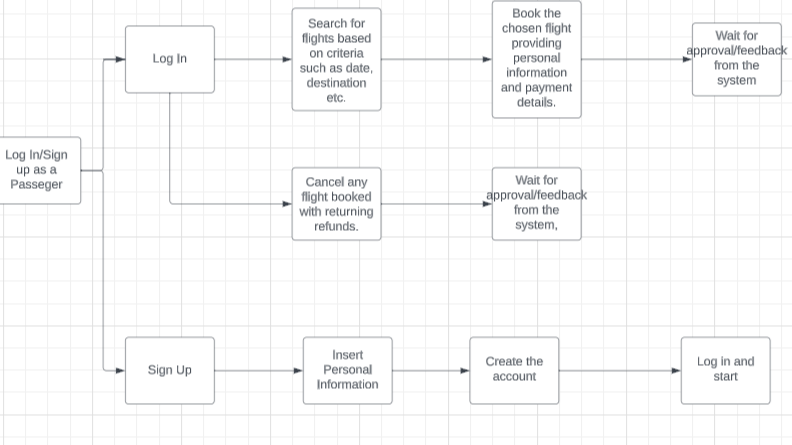
--Breakdown:

* As an administrator I will press the menu button and then the manage passenger accounts button.
* As an administrator I will see a list with all the registered members of our system.
* As an administrator I will select a passenger that I want to delete , and press delete passenger.
* As an administrator I will select a passenger that I want to reset its password, and press reset password.

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**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.