Airline Flight Reservation System

Team 2					
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OVERVIEW

Our project is to develop a database dedicated to the Flight Reservation System component of an Airline company, say for example American Airlines. The business requirement is restricted to

the flights exclusive to the Airline company. Note that this is different than general ticketing systems like Kayak or Expedia which allows users to book flight tickets from multiple Airlines.

This document outlines the problem statement and the objectives of the team. We also provide the Entity Relationship diagram of our proposed database structure and a detailed listing of our entities.

PROBLEM STATEMENT

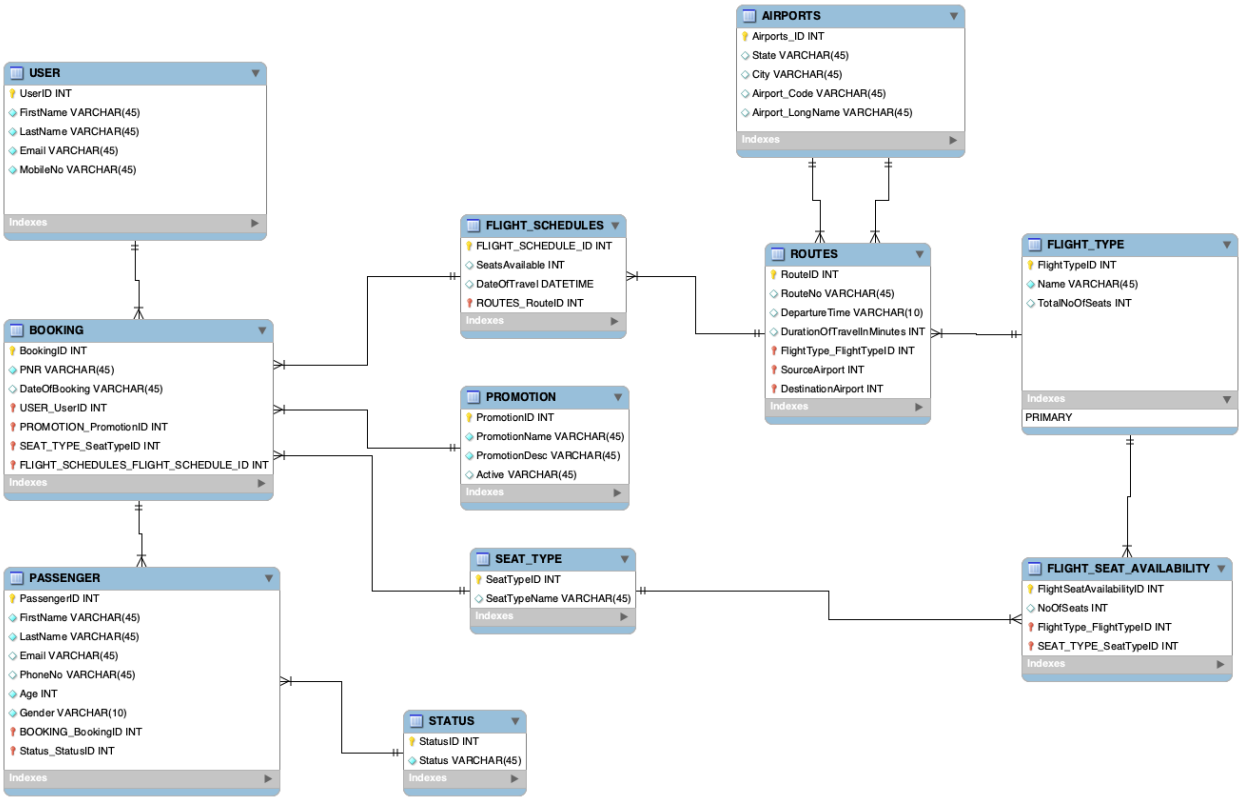
"It's a small world."
The world is now a global village because of the interconnectedness provided by air travel. Just in the USA the FAA manage 45,000 average daily flights. Almost every airline company in the world have their own dedicated booking system available on their websites. Given that many flights are operated by a single airline on daily basis, vast amounts of booking data are generated. The booking data is crucial for the successful and safe business operation for any airline company. The database infrastructure supporting the booking system should be well-designed, robust and scalable to handle the growing the demand for air travel, constant change of operations plans by the airline and above all else for customer satisfaction and retention. We are proposing a database solution solely dedicated to the Flight Reservation System component for a single Airline company.

OBJECTIVES

Below are the objectives we have identified

1. A flexible solution for the Airline company to be able to
   1.1. Maintain Routes that they provide
   1.2. Manage the different Flight Types they operate
   1.3. Operate Flights for each day
2. List of objectives from the customer perspective
   2.1. Book flight tickets for available Flight Schedules
   2.2. Have multiple passengers in one booking
   2.3. Select booking type – Economy/Business
   2.4. Apply promotions to a booking
3. Reading & updating of seat availability

Revised ERD



Business rules

1. Our business requirement allows only registered users to reserve flight tickets
2. A Flight Schedule Records can be created only for existing Routes
3. The flight schedule table should be populated with records on a periodic basis
4. A booking can go through only if the required no of seats for that Seat type (i.e., Economy/Business) are available
5. A single booking is assigned a single promotion only
6. A single booking is assigned a single seat type (i.e. Economy/ Business), meaning all passengers will have the same seat type
7. A user can cancel a booking made for a passenger. For example, if a user has made a booking for 5 passengers, the user can cancel for 2 passengers among the 5
8. Any time a booking is made the Seat Availability Count should be updated for that flight schedule

Views to be documented.

Seat Distribution View:
This view will display the seating distribution in the different flight types operated by the airline

Flights Operational Today:
This view will display the flights being operated on current day i.e. all the flights departing today

Passengers Travelling Today:
This view will display the passenger details travelling on current day

Passengers Travelling Quarterly:
This view aims at showing information pertaining to seasonal variation in passenger traffic and show the count per seat type

Passenger Traffic by Source State:
This view will display states from where high number passengers are travelling from

Passenger Traffic by Destination State:
This view will display states from where high number passengers are travelling to

Frequent Users View:
This view will display the users' details who have frequently make bookings

Top Routes Operational (Year, Month, Day):
This view will display the top routes which are routes having high number of bookings in the in a particular year, month, or day

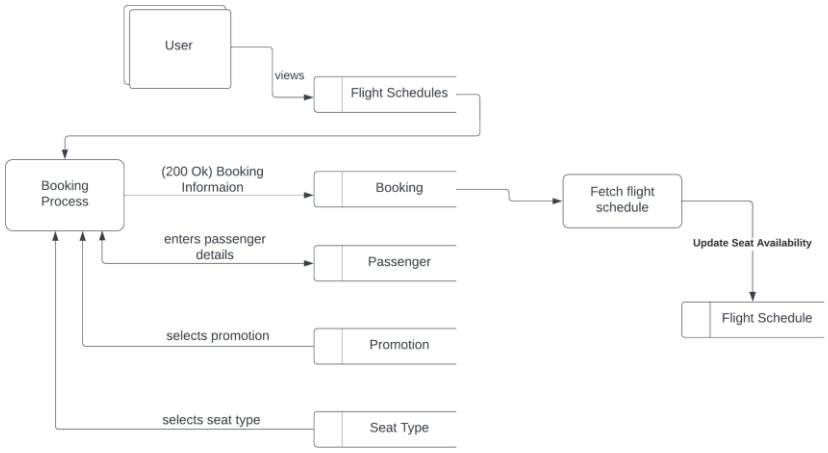
Top Flights Operational Today:
This view will display the flights on the current day having high number of bookings

Top Promotions:
This view will display the top promotions used by customers for bookings

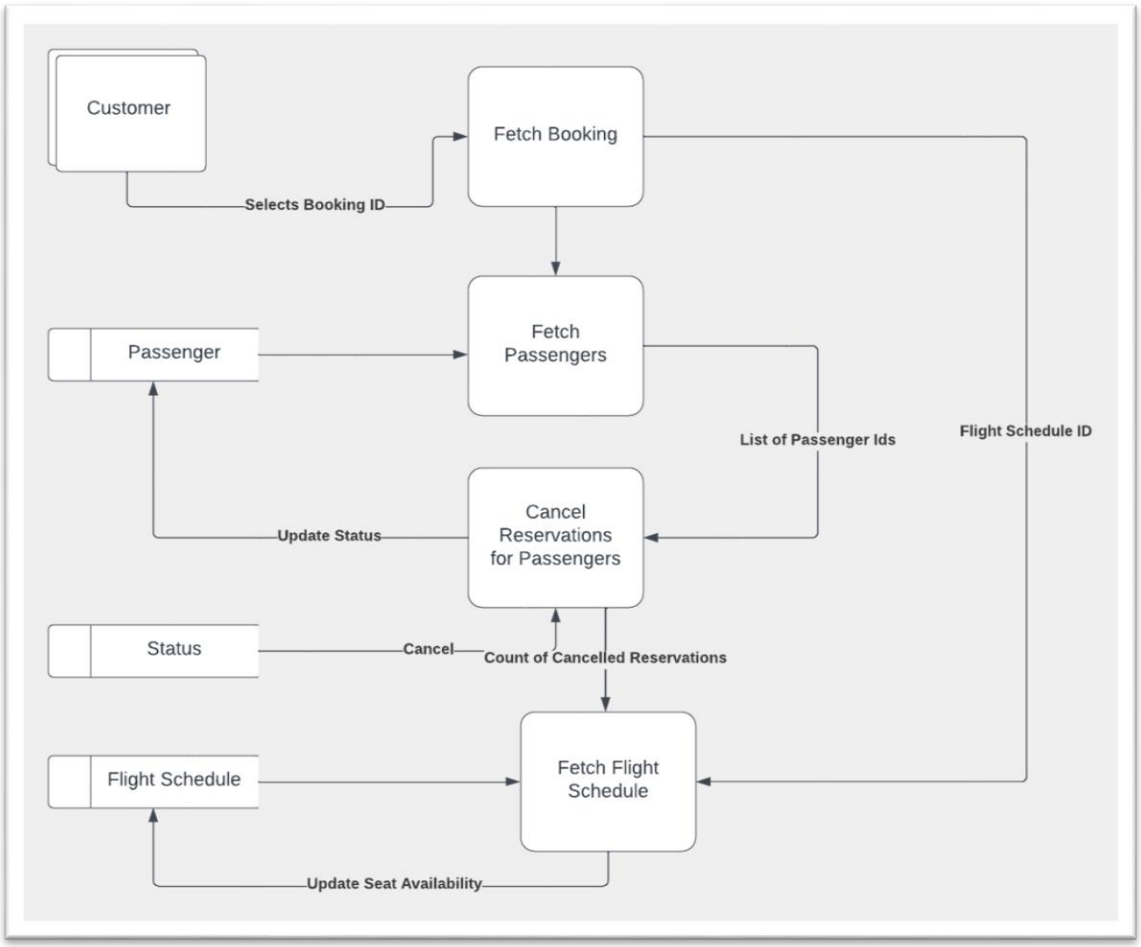
Top Routes with Vacant Seats:
This view will help identify routes which are not performing well i.e. having large number of vacant seats

Data Flow Diagrams

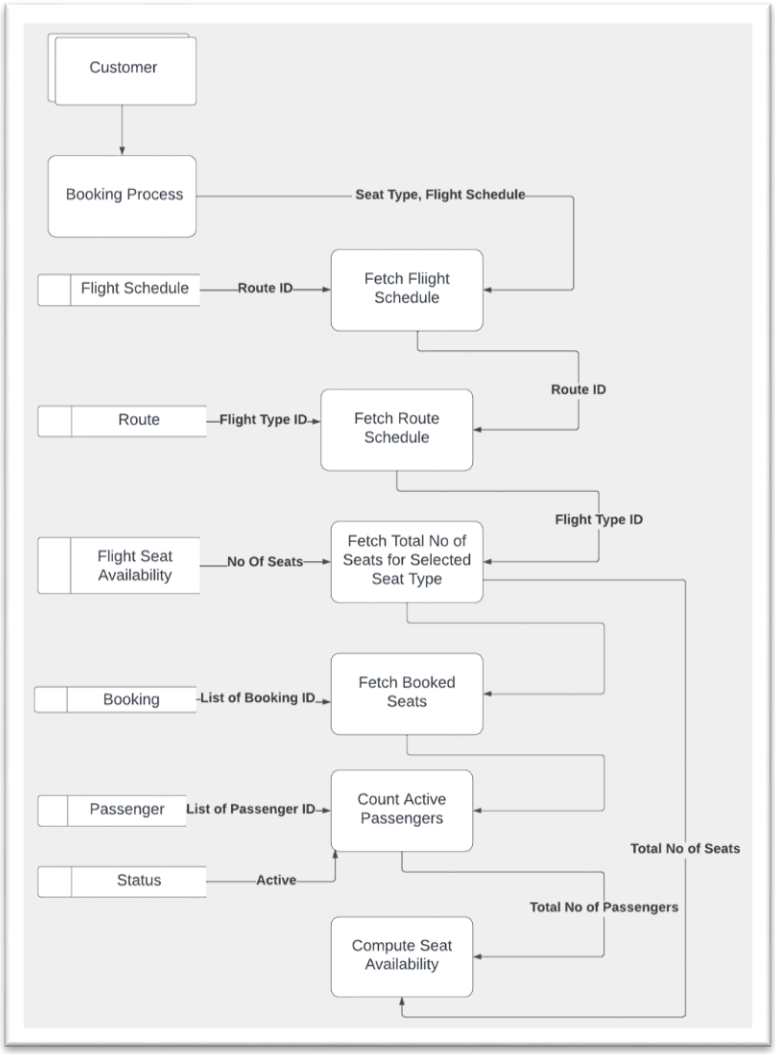
User Booking



User cancellation



Compute Seat Availability


Customer
Booking Process
Seat Type, Flight Schedule
Flight Schedule
Route ID
Fetch Fliight Schedule
Route ID
Route
Flight Type ID
Fetch Route Schedule
Flight Type ID
Flight Seat Availability
No Of Seats
Fetch Total No of Seats for Selected Seat Type
Booking
List of Booking ID
Fetch Booked Seats
Passenger
List of Passenger ID
Count Active Passengers
Total No of Seats
Status
Active
Total No of Passengers
Compute Seat Availability

Security Constraints

In total, a user with database access can play one of the below three roles, i.e:

1. Admin
2. Customer
3. Airline Admin

Tables involved in the system are:

1. Customer
2. Flight_Schedules
3. Routes
4. FlightType
5. Promotion
6. Seat_Type
7. Passenger
8. Booking
9. Flight_Seat_Availability
10. Airports

CUSTOMER ACCESIBILITY

The following attributes in the below mentioned table (according to Entity model) are accessible by the customer:

1. **Table Name – User:**
   CustomerID, FirstName, LastName, Email, Mobileno

2. **Table Name – Flight_Schedules:**
   Flight_Schedule_ID, SeataAvailable, DateOfTravel, RouteId

3. **Table Name – Promotion:**
   PromotionID, PromotionName, PromotionDesc , Active

4. **Table Name – Seat_Type:**
   SeatTypeID, SeatTypeName

5. **Table Name – Passenger:**

PassengerID, FirstName, LastName, Email, PhoneNo, Age

6. **Table Name – Booking:**
   BookingID, PNR, NoOfPassengers, DateOfBooking, UserID, PromotionID, SeatTypeID, FlightScheduleID, RouteID

AIRLINE ADMIN ACCESIBILITY

The following attributes in the below mentioned table (according to Entity model) are accessible by the airline admin user:

1. **Table Name – Flight_Schedules:**
   Flight_Schedule_ID, SeataAvailable, DateOfTravel, RouteId

2. **Table Name – Routes:**
   RouteID, Source, Destination, RouteNo, DepartureTime, ArrivalTime, FlightType ID

3. **Table Name – FlightType:**
   FlightTypeID, Name, TotalNoOfSeats

4. **Table Name – Promotion:**
   PromotionID, PromotionName, PromotionDesc , Active

5. **Table Name – Seat_Type:**
   SeatTypeID, SeatTypeName

6. **Table Name – Flight_Seat_Availability:**
   ID, NoOfSeats, FlightTypeID, SeatTypeID

7. **Table Name – Airports:**
   Airports_ID , State, City, Airport_Code, Airport_LongName

ADMIN ACCESIBILITY

Admin can access all the attributes of the above-mentioned tables.