I. BUSINESS RULES

a. Airline System Overview

i. The airline system consists of 6 airlines, each based in a different country. Each airline has a unique airline code and can operate numerous flights in multiple countries. The system involves 12 cities (but is not restricted to), with two cities located in each country, and these cities can have various departure and arrival flights.

b. Entities

i. Flight Entity

1. A flight is a unique entity identified by a flight number. It is operated by a single airline and is associated with two distinct cities, one serving as the origin and the other as the destination. Each flight has the following attributes:
    A. Airline code (unique identifier for the operating airline)
    B. Business class indicator (boolean value indicating the availability of business class)
    C. Smoking class indicator (boolean value indicating the availability of a smoking section)
    D. Date and time of departure and arrival
    E. Number of booked seats in economy class
    F. Number of available seats in economy class
    G. Number of booked seats in business class
    H. Number of available seats in business class

ii. Customer Entity

1. A customer is an entity with a unique mailing address. The customer entity has the following attributes:
    A. First name
    B. Last name
    C. Zero or more phone numbers
    D. Zero or more fax numbers
    E. Zero or more email addresses
2. Multiple customers can share the same attribute values (e.g., phone number, email address).

iii. Booking Entity

1. A booking is a unique entity identified by a booking number. It has the following attributes:
    A. Booking date
    B. Flight number
    C. Date and time of departure
    D. Date and time of arrival
    E. Class indicator (economy or business class)
    F. Total price
    G. Status indicator (booked, canceled, or scratched)
    H. Payment details:

i. Amount paid
ii. Outstanding balance

I. Customer name

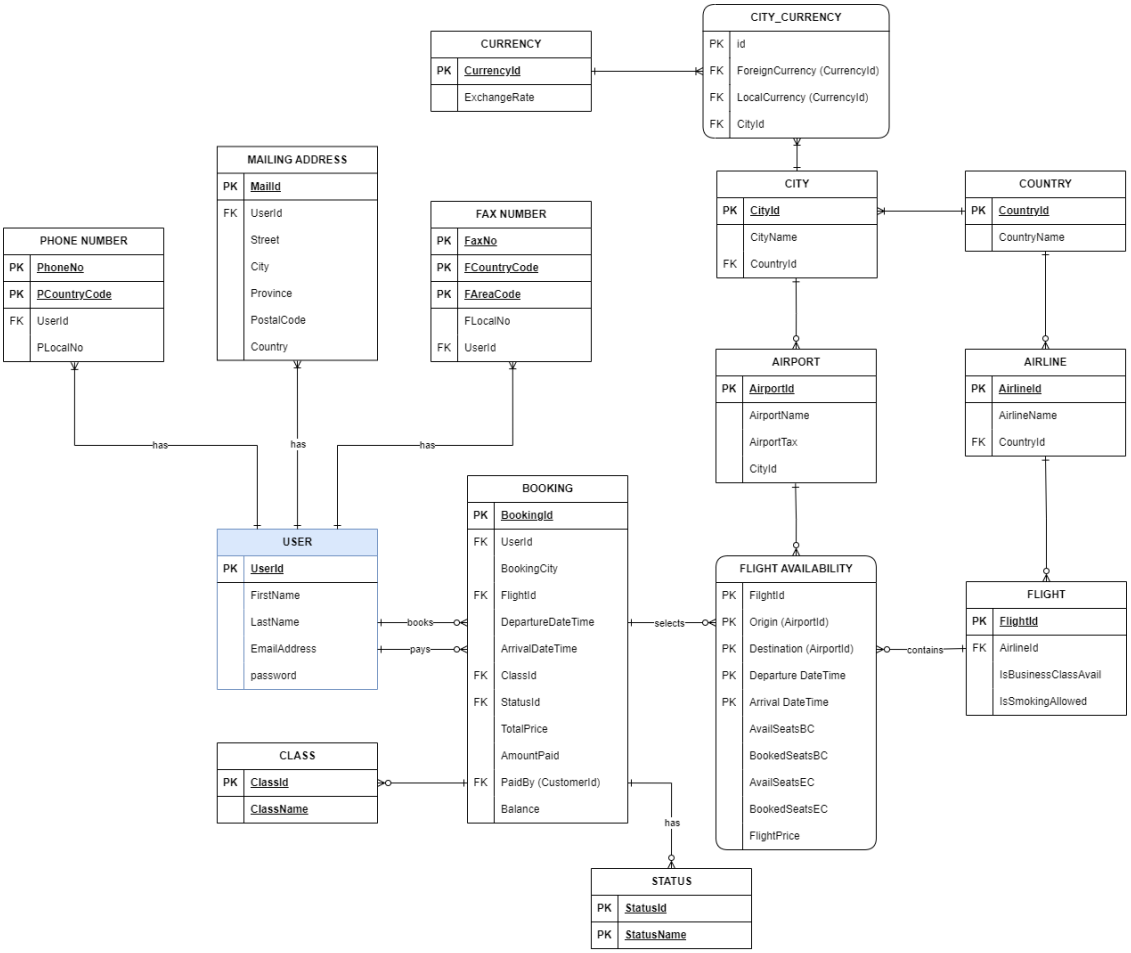
2. Additionally, each booking involves airport taxes stored in local currencies of the respective countries. Exchange rates are stored to facilitate currency conversions across countries.

c. Relationships
   i. A flight is operated by one airline and is associated with an origin city and a destination city.
   ii. A customer can book multiple flights.
   iii. A booking is associated with one customer and one flight.

II. ASSUMPTIONS

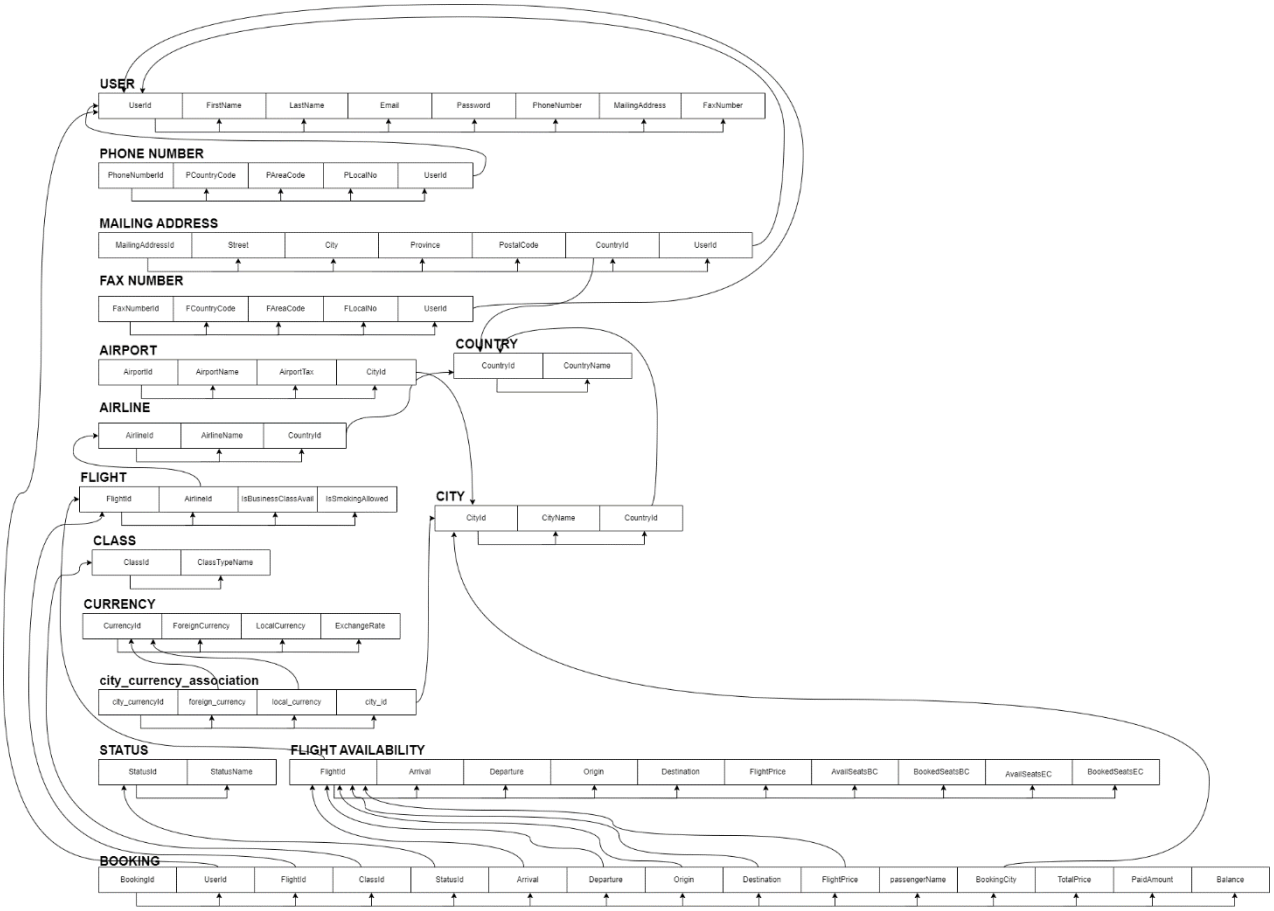
a. i. Business class indicator and smoking allowed indicator are boolean values.
b. ii. Date and time attributes are stored in local time.
c. iii. Status indicator can only have one of the three values: "booked," "canceled," or "scratched."
d. iv. Total price includes the airport taxes and is stored in the local currency of the departure city.
e. v. The "amount paid so far" and "outstanding balance" are stored in the same currency as the total price.
f. vi. A customer can have multiple bookings, but each booking is associated with one customer.

III. ENHANCED ENTITY RELATIONSHIP DIAGRAM (EERD)

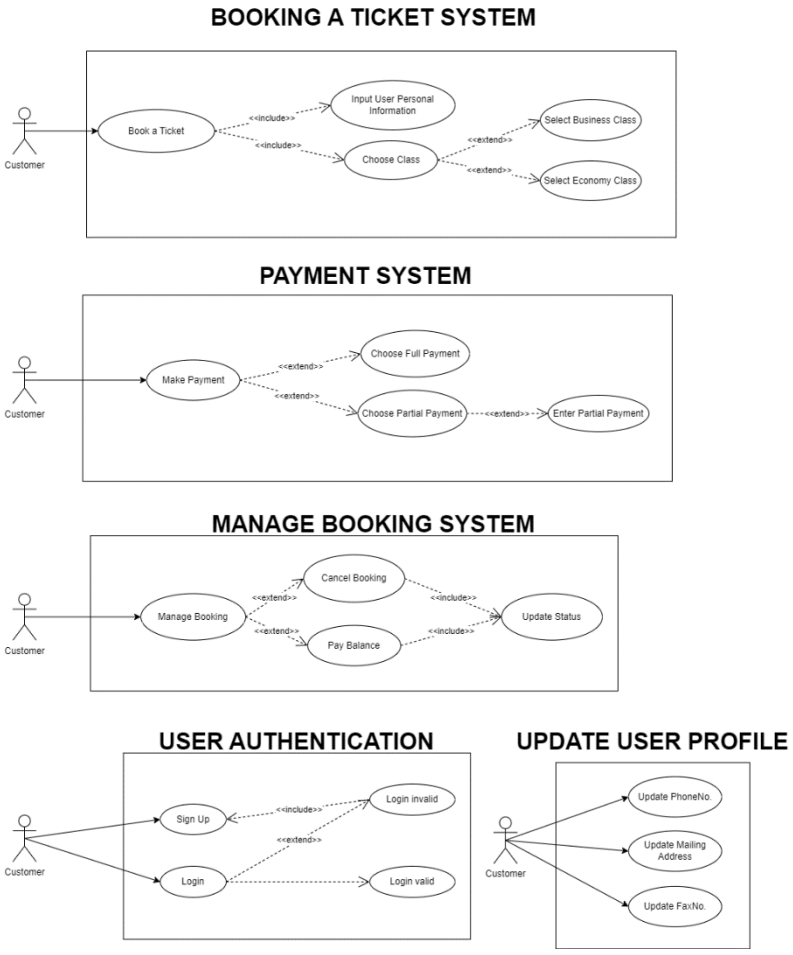


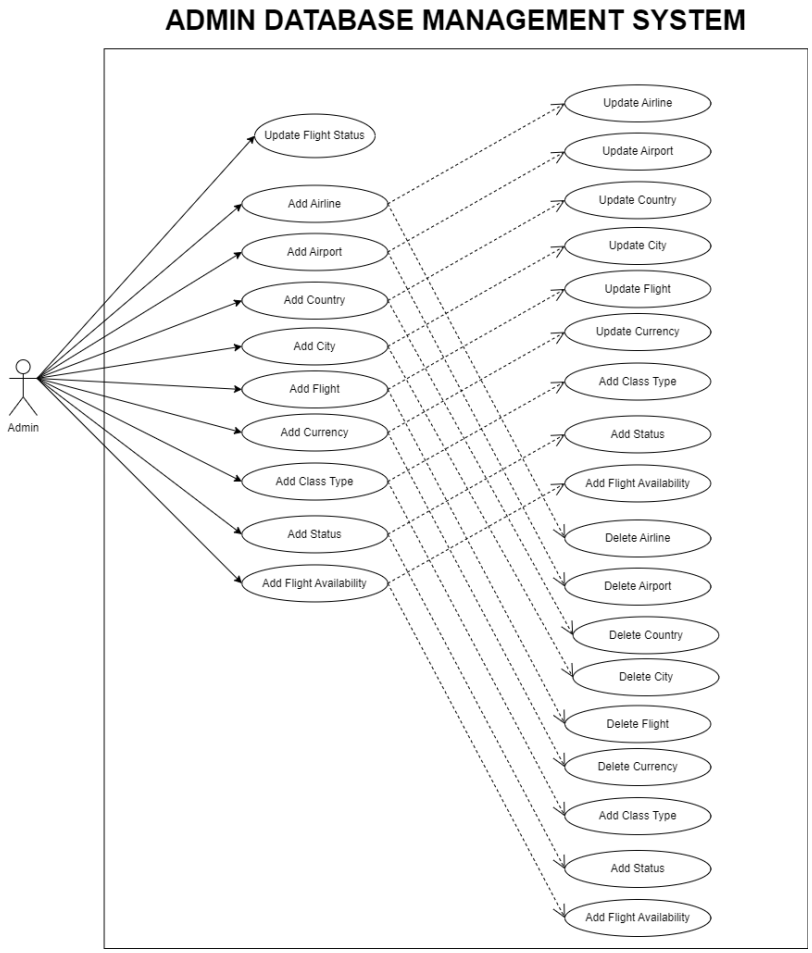
IV. RELATIONAL SCHEMA AND DIAGRAM

a.



b.


BOOKING A TICKET SYSTEM
Customer
Book a Ticket
<<include>>
<<include>>
Input User Personal Information
Choose Class
<<extend>>
<<extend>>
Select Business Class
Select Economy Class
PAYMENT SYSTEM
Customer
Make Payment
<<extend>>
<<extend>>
Choose Full Payment
Choose Partial Payment
<<extend>>
Enter Partial Payment
MANAGE BOOKING SYSTEM
Customer
Manage Booking
<<extend>>
<<extend>>
Cancel Booking
Pay Balance
<<include>>
<<include>>
Update Status
USER AUTHENTICATION
Customer
Sign Up
Login
<<include>>
<<extend>>
Login invalid
Login valid
UPDATE USER PROFILE
Customer
Update PhoneNo.
Update Mailing Address
Update FaxNo.


ADMIN DATABASE MANAGEMENT SYSTEM
Admin
Update Flight Status
Add Airline
Add Airport
Add Country
Add City
Add Flight
Add Currency
Add Class Type
Add Status
Add Flight Availability
Update Airline
Update Airport
Update Country
Update City
Update Flight
Update Currency
Add Class Type
Add Status
Add Flight Availability
Delete Airline
Delete Airport
Delete Country
Delete City
Delete Flight
Delete Currency
Add Class Type
Add Status
Add Flight Availability

V. DATA FLOW DIAGRAM (DFD)