

Database Topic: Travel Booking System (Kayak.com)

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Mission Statement:

The purpose of the database is to maintain the data of flight reservation provided by kayak.com. It will benefit the marketing team as well as to the stakeholders at Kayak to analyze the stored data and increase their business. Through this database, Kayak could know about its most used feature (or most popular fare rule codes) and could provide better service to their customers.

Business Problems Addressed:

1. Allow Kayak admins to manage schedules, deals and demands to generate max revenues
2. Provide best deals at lucrative time of year to attract customer interest
3. Supply all service related information based on customer query to make decision to choose best service
4. Allow customers to book tickets at best available price
5. Permit Kayak staff to generate reports and perform predictive analysis on sales done at Kayak

Design Decisions:

Entity Name	Why Entity included	How Entity is Related to Other Entities
ServicesOffered	The main business of Kayak is to provide services to its customers to allow booking of tickets at best possible rates.	This is the most important entity in the database as Kayak provides various types of Services to its customers. It is related to the ServiceType Entity. It is super class with different service offerings as its subclasses.
ServiceType	This entity describes the service being offered to the customer. It included name, description and industry type.	This is connected to ServicesOffered and is used to distinguish between the different types of Services being offered by Kayak.
HotelListings	This is one of the services offered by Kayak which lists the various hotels which are listed on Kayak and provide their availability start and end dates.	This is connected to Hotel entity to retrieve all available hotels and it is a sub class of ServicesOffered.
Hotel	This entity represents a Hotel which is being listed in Kayak. The entity contains info about the number of rooms available along with base fare associated to each room.	The Hotel entity is part of the various HotelListings available. Since each Hotel has a Location, it is connected to the Location entity and each Hotel would be available for booking so it is connected to the HotelBooking entity.
CarRentalListings	This is one of the services offered by Kayak which lists the various cars which are listed on Kayak and provide their availability start and end dates.	This is connected to Car entity to retrieve all available cars and it is a sub class of ServicesOffered.

Car	This entity represents a Car which is being listed in Kayak. The entity contains info about the car model, car name, seating capacity along with base fare associated to each car.	The Car entity is part of the various CarRentalListings available. Since each Car has a pickup location, it is connected to the Location entity and each Car would be available for booking so it is connected to the CarBooking entity.
BusBookingListings	This is one of the services offered by Kayak which lists the various buses which are listed on Kayak and provide their journey start date and journey duration.	This is connected to Bus entity to retrieve all available buses and it is a sub class of ServicesOffered.
Bus	This entity represents a bus which is being listed in Kayak. The entity contains info about the bus name, location of journey start and base fare associated to each seat of bus.	The Bus entity is part of the various BusBookingListings available. Since each Bus has a start location of journey, it is connected to the Location entity and it is connected to the BusSeat.
BusSeat	A BusSeat entity represents each seat in a bus which is available for booking. It contains information regarding its availability.	The BusSeat is connected to Bus entity of which it is a part of and it would be available for booking so it is connected to the BusBooking entity.
Airline	The important Airline information to collect includes Airline Code, Name of Airline, Description and Headquarter Location. The database stores this information to further store information about schedule of flights operated by the airline along with the fare rules associated to each class of seat in a flight.	It is the most important entity in the database as the schedule of flights and fare to be charged to customer depends on the Airline. One Airline operates multiple flights and each Airline is associated with one headquarter location.
Flight	Each Airline operates multiple flights between a pair of cities i.e. the Source Location, Destination Location. Every flight has a Flight Code associated with it.	Since every airline operates multiple flights, there is a one to many relationship between Airline and Flight. Also since a flight has source and destination locations, it is related to Airport entity too.
Class	It indicates the type of Cabin, i.e. the Class of the ticket which determines the ticket price; for example, Business Class, First Class and Economy Class. The information stored includes Class Code, Flight Code, Class Name and Seating Capacity of class.	The Class entity is related to Flight as one Flight can have 1 or more class of seating. Also, each Class has multiple Seat entities related to it, to determine the Seating Capacity. As the fare is determined based on Class of Seating, Fare Rule has a one to one relationship with it.

Seat	This entity depicts the availability in the flight for the selected class. This will be the final output for the user's transaction where he/she will reserve a seat in flight. It will also serve the airline to determine how much capacity is remaining to be sold and how many people are boarding the flight. This in turn, can be utilized to provide the best experience while minimizing the cost.	As for each selected flight and its class, there will be a seat capacity associated with it, the relation between the class and seat will be one-to-many. The seat will determine the total number of passengers boarding the flight and in turn help the airline in planning its flight operation.
FlightClass	Since each flight has multiple class of seats associated to it and each class type is part of multiple flights, there's a many to many relationship between the two. Thus, an associative entity called FlightClass exists to map this relationship.	The FlightClass entity is connected to both Flight and Class entities as it's an associative entity.
FlightScheduleListings	Since each Flight operates as per a fixed schedule, an entity called Flight Schedule is created. It provides the arrival and departure times. Also, an Itinerary allows a customer to Plan their trip by including multiple Flight Schedules.	The Flight Schedule is related to Flight as a one to one relationship since each flight can have only one schedule of operation. Itinerary allows customer to include multiple flight schedules for their booking so they have a one to many relationship.
Airport	The entity airport represents a location from where a flight can depart or arrive. Every flight has an associated departure airport as well as an arrival airport.	The Airport has a location associated with it, so a one-to-one relationship exists between the two. Also, a one-to-many relationship is present between the Airport and Flight entities.
Location	It is used to indicate the location of airport from which the flights depart or arrive. It consists of City, State and Country entities.	Every Airline is associated with a Headquarter location as well the location of Airport from where flights depart and arrive. It has a foreign key relationship with City, State and Country entities.
City	It is used to indicate the City of an associated location.	The location is associated with a City entity with a one to one relationship.
State	It is used to indicate the State of an associated location.	The location is associated with a State entity with a one to one relationship.
Country	It is used to indicate the Country of an associated location.	The location is associated with a Country entity with a one to one relationship.
FareRule	This entity contains details of various fare rules decided by Kayak for the services offered. It contains details of rule description, code, rule start date, rule end date and type of service its applicable for.	This is a superclass entity which has various sub classes for each service type and is connected to Hotel, Car, Flight and Bus entities.
FareRuleHotel	This entity is used to define the fare rules for a hotel and contains various parameters on which the fare rule is applicable for a hotel.	This is a sub class entity and is connected to FareRule and the HotelBooking entity as a rule is applicable to a booking.
FareRuleCar	This entity is used to define the fare rules for a	This is a sub class entity and is connected to

	car and contains various parameters on which the fare rule is applicable for a car.	FareRule and the CarBooking entity as a rule is applicable to a booking.
FareRuleBus	This entity is used to define the fare rules for a bus seat booking and contains various parameters on which the fare rule is applicable for a bus seat.	This is a sub class entity and is connected to FareRule and the BusBooking entity as a rule is applicable to a booking.
FareRuleFlight	This entity is used to define the fare rules for a flight seat booking and contains various parameters on which the fare rule is applicable for a flight.	This is a sub class entity and is connected to FareRule and the FlightBooking entity as a rule is applicable to a booking.
Bookings	This entity contains details of services selected by customer and contains all data about the booking including start date, end date, calculated fare, tax, booking date, bonus points earned by customer for the booking.	This is a superclass entity which has various sub classes for each booking type and is connected to HotelBooking, CarBooking, FlightBooking and BusBooking entities. It is further connected to Ticket and UserAccount entities.
HotelBooking	This entity is used contains information about a Hotel room which is booked by a customer.	This is a sub class entity and is connected to Bookings and the Hotel entity as a booking is made for a Hotel room.
CarBooking	This entity is used contains information about a car which is booked by a customer.	This is a sub class entity and is connected to Bookings and the Car entity as a booking is made for a car.
FlightBooking	This entity is used contains information about a flight seat which is booked by a customer.	This is a sub class entity and is connected to Bookings and the Flight Seat entity as a booking is made for a flight seat.
BusBooking	This entity is used contains information about a bus seat which is booked by a customer.	This is a sub class entity and is connected to Bookings and the Busentity as a booking is made for a bus seat.
Passenger	Represents the person undertaking the booking and contains the personal details like Passenger Name, Passport ID, Date of Birth and Gender. Also, a Booking ID from Bookings is associated with every Passenger in the associative entity BookingsPassenger.	The Passenger entity is connected to BookingsPassenger as there is many to many relationship between the Passenger and Bookings
BookingsPassenger	As a passenger, can have many bookings and a booking can have several passengers, there is a many to many relationship between them. This entity is an associative entity to map the relationship.	This entity is connected to both Passenger and Bookings entity as it is an associative entity.
User Account	It is used to associate the booking with an account present in the database. This entity is mainly included to keep the record of the tickets booked by the user. This could possibly be used by the sales team to determine the user's favorite routes and then manage the offers provided to for the user. It also included information about the total bonus points earned	The User Account is directly related to the Bookings entity. Since the customer can use his/her account to book multiple tickets, the relationship between them is one-to-many.

	by each user.	
Ticket	A Ticket represents a confirmation of the Booking having a Ticket ID and timestamp of ticket generation. Each Ticket has a unique Booking ID associated with it.	The Ticket entity is associated with Bookings which contains all information about User Account which is used to make the booking as well as information about passengers.

Shopping Cart	A shopping cart is a virtual entity related to each user containing data about user's interested services.	The Shopping Cart is connected to User Account entity.
User Search History	This entity is used to track the search history done by the users to Kayak.com. It will help Kayak do analytics on the kind of services users want to search and book.	This entity is connected to User Account to keep track of searches done by a user.
User Login History	This entity is used to track the login history of the users to Kayak.com. It will help Kayak do analytics on the number of times users login and to track how many users are inactive since long time and send them targeted offers to get them to visit the website once again.	This entity is connected to User Account to keep track of login attempts made by a user.
Payment	This entity is used to keep track of Payments done by customers for a particular booking. It contains information about the amount paid, type of payment, payment date, booking date and category of payment.	It is a superclass entity with various payment types as sub classes. It is associated to a Bookings entity as every booking is associated to a payment.
CreditCardPayment	This entity is used contains information about a credit card payment which is associated with a booking.	It is subclass which is connected to the Payment super class.
DebitCardPayment	This entity is used contains information about a debit card payment which is associated with a booking.	It is subclass which is connected to the Payment super class.
AccountPay	This entity is used contains information about a	It is subclass which is connected to the

	account pay payment which is associated with a booking.	Payment super class.
PayPal	This entity is used contains information about a PayPal account payment which is associated with a booking.	It is subclass which is connected to the Payment super class.