

Urban Ride-Sharing Management System

Overview

The Urban Ride-Sharing Management System emerges as a smart friend for city travel, ensuring that we get where we need to go while still being environmentally cum pocket friendly. This centralized database will include information on drivers and passengers who are willing to carpool to nearby destinations. It will help store, manage, organize, maintain, and retrieve data attributed to carpooling rides across the city and beyond.

Entities

S.No.	Entity Name	Description
1	User	<p>Represents individuals who use the urban ride-sharing management system to request rides or offer rides.</p> <p>Attributes: User ID, first name, last name, gender, age email, phone number, user type</p>
2	Driver	<p>Individuals registered on the platform who offer transportation services to users by driving their vehicles.</p> <p>Attributes: Driver ID, User ID, license number, rating, carID</p>
3	Passenger	<p>Individuals registered on the platform who request a ride-sharing service from one location to another.</p> <p>Attributes: Passenger ID, User ID, passenger name, phone number</p>
4	Trip Details	<p>Instances of transportation service provided to users by drivers. Each ride instance captures details such as the starting and ending locations, duration, fare, and timestamp of the ride.</p> <p>Attributes: Trip ID, start location, end location, date, fare, duration, Location ID</p>

5	Car	<p>Represents the cars used by drivers to provide ride-sharing services. Each driver may have one or more vehicles associated with their profile</p> <p>Attributes: Car ID, car type, car model, year, registration number, license plate, capacity, status</p>
6	Location	<p>Represents a geographical location, such as the starting or ending point of a trip</p> <p>Attributes: Location ID, address, latitude, longitude</p>
7	City	<p>Represents a city where the ride-sharing service operates. Contains information such as the city name, country, and timezone</p> <p>Attributes: City ID, LocationID, city name, country</p>
8	Billing Details	<p>Stores billing information for users, including payment methods and billing addresses</p> <p>Attributes: Billing ID, user ID, Trip ID, Driver ID, Passenger ID, amount, payment method, billing address</p>
9	Complaint	<p>Captures complaints provided by users (both drivers and passengers) after completing a trip. Includes a rating and optional comments regarding the service</p> <p>Attributes: ComplaintID, Trip ID, complaint description</p>
10	Customer Service	<p>Represents the customer service department responsible for handling user inquiries, complaints, and support tickets</p> <p>Attributes: Customer service ID, contact details, support tickets</p>

Relationships

User	Driver	A User is either a Driver or a Passenger
User	Passenger	A User is either a Driver or a Passenger
Driver	Car	Mandatory One to Mandatory Many
User	Trip Details	Mandatory One to Optional Many
Trip Details	Location	Mandatory Many to Optional Many
Location	City	Mandatory Many to Mandatory One
User	Billing Details	Mandatory One to Optional Many
Passenger	Complaint	Mandatory One to Optional Many
Complaint	Customer Service	One to One

Business Problems Addressed

1. The system aims to reduce traffic congestion in urban areas by promoting carpooling and efficient route optimization.
2. By encouraging ride-sharing and potentially introducing electric vehicles, the system contributes to reducing carbon emissions and pollution in cities.
3. Providing a cost-effective alternative to individual car ownership, the system aims to make transportation more affordable for urban residents.
4. Offering a convenient transportation option, the system enhances accessibility for individuals without access to personal vehicles or public transportation.
5. Through efficient matching of drivers and passengers, the system minimizes fuel consumption and maximizes the use of available transportation resources.

Database Design Decisions

1. **User (Driver/Passenger):** Users are the primary stakeholders in the ride-sharing ecosystem. Including separate entities for drivers and passengers allows the system to differentiate between individuals offering rides and those requesting rides, facilitating efficient matching and communication.
2. **Trip Detail:** Trip details capture essential information about each ride, including start and end locations, timestamp, fare, and duration. Storing trip data in a centralized database enables analysis of usage patterns, optimization of routes, and generation of data-driven insights to improve service quality.
3. **Car:** Cars are the vehicles used by drivers to provide ride-sharing services. Including a separate entity for cars allows the system to manage vehicle information such as make, model, year, and license plate, facilitating efficient assignment of vehicles to drivers and tracking of vehicle-related data.
4. **Location:** Locations represent geographical points such as the start and end locations of trips. Including a separate entity for locations enables accurate tracking of trip routes, calculation of distances, and optimization of route matching, contributing to overall system efficiency and user satisfaction.
5. **Billing Details:** Billing details capture financial information related to ride-sharing transactions, including payment methods and billing addresses. Storing billing data in a centralized database ensures secure and efficient management of financial transactions, enhancing user trust and satisfaction.
6. **Complaint:** Complaint allows users to raise complaints and comments on their ride-sharing experiences. Including a separate entity for complaints enables the system to collect and analyze user complaints, identify areas for improvement, and maintain service quality standards, ultimately enhancing user satisfaction and loyalty.
7. **Customer Service:** Customer service handles user inquiries, complaints, and support tickets. Including a separate entity for customer service enables efficient management of user interactions, timely resolution of issues, and proactive communication with users, enhancing overall user experience and satisfaction.