

# **Assignment 1: Phase I: Logical Database Design**

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## **Application Database:**

The database system we chose as our model example was a car rental DBMS which primarily manages a system that holds information related to entities such as Cars, Customers, Transactions, etc. This system needs to be organized and structured in a way that allows quick access to its held information and its attributes. Each entity its structure needs to hold information in a way that is concise and allows for its data to be retrieved in an organized manner. As such car rentals DBMS must have a unique form of withholding its information to be able to retrieve its data structured and efficient manner different from a simple linear database.

The primary users of this DBMS would be the personnel and staff working at the selected car rental company or in some cases could be management companies that monitor their software and DB systems. A secondary user of the system would be the customers themselves as there would be separate web pages that the customers would have access to which would allow them access information that is related to their specific purchase/rental.

The primary goal of our database system would be to develop a system that allows the rental company to organize and structure its data in a concise, efficient way. Specific entities such as Customer, Department, Employees, etc. which will have specific attributes that will allow them to be concise and retrieve information efficiently when needed. One example would be the entity Customers which would allow the rental company to retrieve information on every customer easily and concisely as it would have attributes like name, phone, address, and order history. The DBMS would allow every user to easily retrieve a large amount of information that's stored on server end.

## **Data Types And Relations:**

### **Entities**

#### **Employees:**

##### Information:

Contains data related to the employees of the company, including their name, contact information, job role, and schedules.

##### Use:

This is used to: manage, track and evaluate the performance of employees and schedule their work.

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#### **Departments:**

##### Information:

The department entity in the car rental database stores information on the different departments within the company, including the type of cars they handle and the employees that work in those departments.

##### Use:

This is used to: manage, track and evaluate the performance of each department.

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#### **Customers:**

##### Information:

Holds data on the customers of the company, including their names, contact information, and rental history.

##### Use:

This is used to: match customer needs with available cars, track their rental history, and monitor customer satisfaction.

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### **Cars:**

#### **Information:**

Holds information on the cars available for rent, including make, model, year, location, and maintenance history.

#### **Use:**

This is used to: match customer needs with available cars, track the usage and maintenance of cars and monitor their performance.

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### **Locations:**

#### **Information:**

Holds information on the different pick-up and drop-off locations for the cars, including addresses and contact information. Along with the store locations.

#### **Use:**

This is used to: track the popularity of each location and monitor their performance.

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### **Bookings:**

#### **Information:**

Holds information on the reservations made by customers, including the dates and times of the reservation, the car rented, and the customer who made the reservation.

#### **Use:**

This is used to: match customer needs with available cars, track their rental history, and monitor customer satisfaction.

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**Transactions:****Information:**

Holds information on the billing process, including the cost of the rental, any additional charges, and payment methods.

**Use:**

This is used to: calculate the cost of the rental, track payments, and monitor the performance of the billing process.

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**Transactions:****Information:**

Holds various reports on the car rental system, including customer rental history, car usage, and revenue.

**Use:**

This is used to: track the performance of the business, identify any issues that may arise, and make decisions based on data.

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## **Relations:**

One of the key components of this database is the relationships between the different parts of the system. These relationships are critical to the efficient and effective management of the car rental business, and they are what allows the company to track customer information, reservations, and car availability, etc. These relationships and how they interact is essential for effectively managing a car rental business.

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### **Cars and department:**

The car information in the database is linked to the various departments of the car rental that are responsible for its care. Ranging from cleaning to maintenance records for those cars, so the company can easily track the instances where operations on the car occurred.

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### **Employee and department:**

The relationship between employee and department allows the company to track which employees work in which department and manage their schedules and roles accordingly.

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### **Location and bookings:**

The relationship between location and bookings allows the company to track which locations are popular and which cars are frequently rented from those locations. Furthermore, it allows you to see the pickup and drop off of cars.

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### **Customers and cars:**

The relationship between customers and cars allows the company to track the rental history of each customer and match them with the appropriate car for their next rental. In addition, it allows the customer to view and be given information about the car they have rented.

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### **Customers and employees:**

The relationship between customers and employees allows the company to track which employees are handling which customers and identify any issues that may arise.

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### **Customers and transaction:**

The relationship between customer and transaction allows the company to track the rental history of each customer and monitor their payments, invoices, and any additional charges.

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