

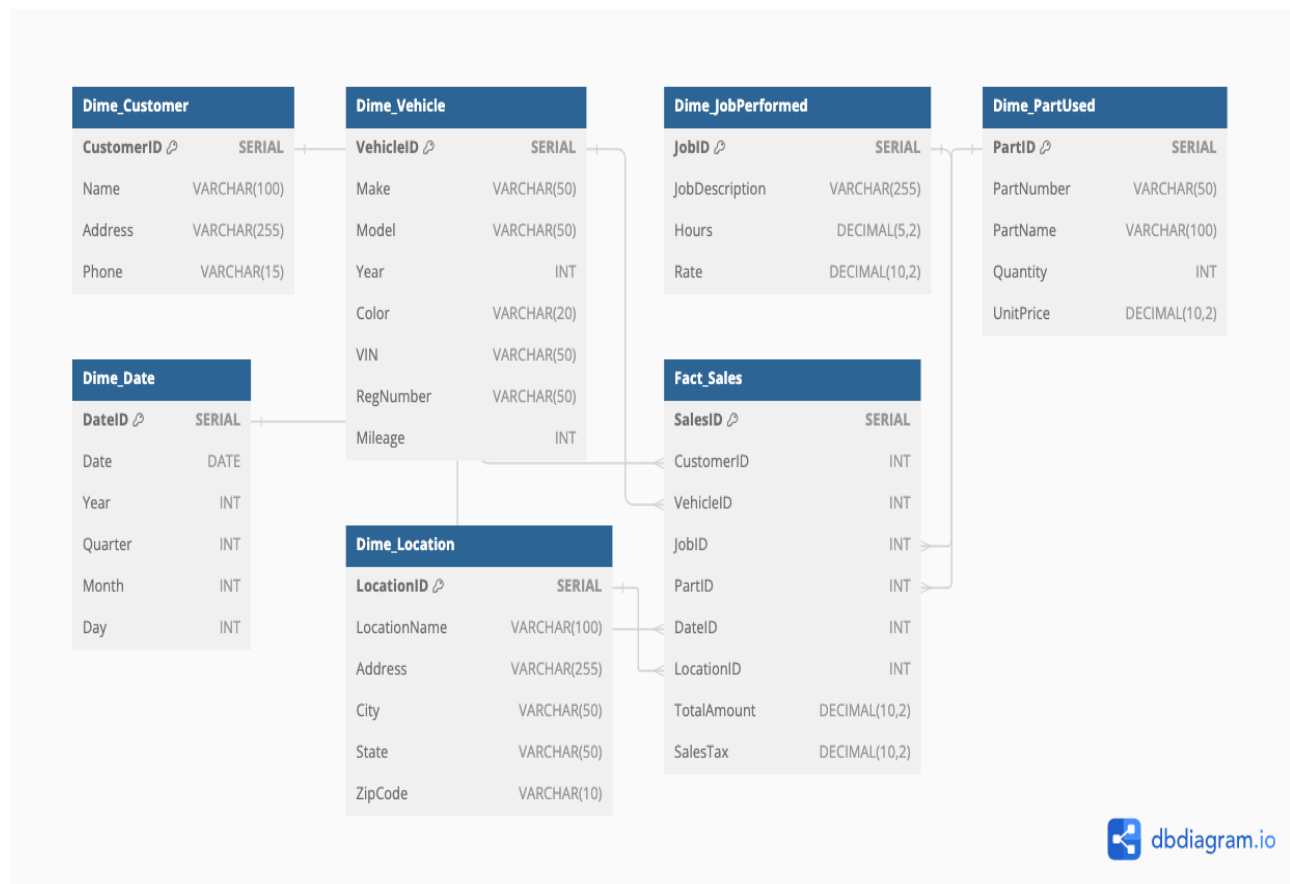
Dimensional Model for Sales Analysis

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Introduction

In this document, we present the dimensional model designed to analyze the sales performance of a car repair shop based on the provided sample invoice. The model is built using PostgreSQL and is designed to support flexible analysis of sales by customer, vehicle brand/model/year, services, parts, and shop location. This document includes descriptions of each table in the model and the logical reasoning behind their creation.

ER Diagram



Tables and Descriptions

1. Customer Dimension Table (Dime_Customer)

Description: This table stores detailed information about each customer, allowing analysis of sales data by individual customers.

Column Name	Data Type	Description
CustomerID	SERIAL	Primary key, unique identifier for each customer.
Name	VARCHAR(100)	Customer's full name.
Address	VARCHAR(255)	Customer's address.
Phone	VARCHAR(15)	Customer's phone number.

Logical Explanation: This table is essential for understanding customer demographics and spending behavior. By analyzing customer information, the business can tailor its services and marketing efforts to better meet customer needs.

2. Vehicle Dimension Table (Dime_Vehicle)

Description: This table captures information about the vehicles serviced, enabling analysis by vehicle make, model, year, and other characteristics.

Column Name	Data Type	Description
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VehicleID	SERIAL	Primary key, unique identifier for each vehicle.
Make	VARCHAR(50)	Vehicle manufacturer.
Model	VARCHAR(50)	Vehicle model.
Year	INT	Year of manufacture.
Color	VARCHAR(20)	Vehicle color.
VIN	VARCHAR(50)	Vehicle Identification Number.
RegNumber	VARCHAR(50)	Registration number.
Mileage	INT	Current mileage of the vehicle.

Logical Explanation: This table is crucial for tracking the types of vehicles serviced and identifying trends in vehicle maintenance needs. It helps in understanding which vehicles are more prone to requiring specific services or parts.

3. Job Performed Dimension Table (Dime_JobPerformed)

Description: This table lists the various jobs performed on vehicles, including job descriptions, hours spent, and rates charged.

Column Name	Data Type	Description
JobID	SERIAL	Primary key, unique identifier for each job.
JobDescription	VARCHAR(255)	Description of the job performed.
Hours	DECIMAL(5,2)	Number of hours spent on the job.
Rate	DECIMAL(10,2)	Hourly rate for the job.

Logical Explanation: This table allows for the analysis of labor performance and cost. By examining job data, the business can identify the most and least common jobs, as well as the most and least profitable services.

4. Part Used Dimension Table (Dime_PartUsed)

Description: This table stores information about the parts used in vehicle repairs, including part numbers, names, quantities, and unit prices.

Column Name	Data Type	Description
PartID	SERIAL	Primary key, unique identifier for each part.
PartNumber	VARCHAR(50)	Part number.
PartName	VARCHAR(100)	Name of the part.
Quantity	INT	Quantity of the part used.
UnitPrice	DECIMAL(10,2)	Unit price of the part.

Logical Explanation: This table helps in tracking inventory and part usage. It is essential for understanding the demand for specific parts and managing stock levels efficiently.

5. Date Dimension Table (Dime_Date)

Description: This table contains date information to facilitate time-based analysis of sales data.

Column Name	Data Type	Description
DateID	SERIAL	Primary key, unique identifier for each date.
Date	DATE	The date of the transaction.
Year	INT	Year of the transaction.
Quarter	INT	Quarter of the year (1-4).
Month	INT	Month of the year (1-12).

Day	INT	Day of the month (1-31).
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Logical Explanation: This table is necessary for performing time series analysis. It allows the business to analyze trends over different periods, such as monthly or quarterly sales performance.

6. Location Dimension Table (Dime_Location)

Description: This table stores information about the locations of the car repair shops.

Column Name	Data Type	Description
LocationID	SERIAL	Primary key, unique identifier for each location.
LocationName	VARCHAR(100)	Name of the location.
Address	VARCHAR(255)	Address of the location.
City	VARCHAR(50)	City where the location is situated.
State	VARCHAR(50)	State where the location is situated.
ZipCode	VARCHAR(10)	Zip code of the location.

Logical Explanation: This table enables the analysis of sales performance by location. It helps in understanding how different locations contribute to overall sales and identifying areas for potential growth.

7. Fact Sales Table (Fact_Sales)

Description: This table stores quantitative data related to sales, linking to the dimension tables to support detailed analysis.

Column Name	Data Type	Description
SalesID	SERIAL	Primary key, unique identifier for each sale.
CustomerID	INT	Foreign key linking to Dime_Customer(CustomerID).
VehicleID	INT	Foreign key linking to Dime_Vehicle(VehicleID).
JobID	INT	Foreign key linking to Dime_JobPerformed(JobID).
PartID	INT	Foreign key linking to Dime_PartUsed(PartID).
DateID	INT	Foreign key linking to Dime_Date(DateID).
LocationID	INT	Foreign key linking to Dime_Location(LocationID).
TotalAmount	DECIMAL(10,2)	Total amount charged for the sale.
SalesTax	DECIMAL(10,2)	Sales tax applied to the sale.

Logical Explanation: This table aggregates all sales-related data, allowing comprehensive analysis across various dimensions. It is the core of the dimensional model, facilitating insights into total sales, tax contributions, and performance across different categories.

Conclusion

This dimensional model provides a structured approach to analyze sales data for a car repair shop. By organizing the data into well-defined dimensions and a central fact table, the model supports detailed and flexible analysis. This enables the business to make informed decisions to optimize operations, enhance customer satisfaction, and drive profitability.