

Database Design Document for Automobile Manufacturing Operations

Group – 5

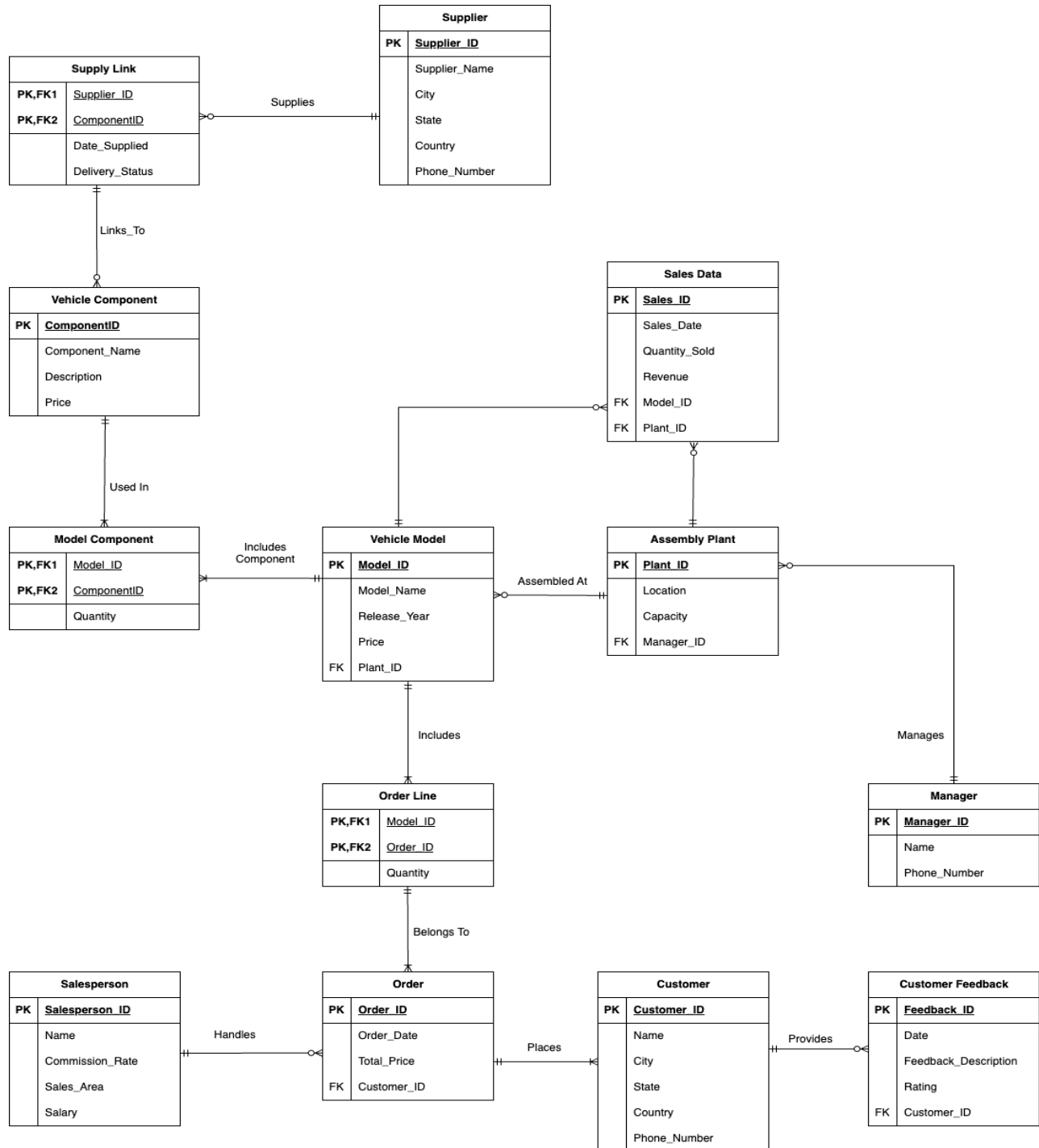
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Entities and Relationships:

Supplier:

- Attributes: Supplier_ID (PK), Supplier_Name, City, State, Country, Phone_Number
- Explanation: Represents suppliers that provide components.
- Relationships: One supplier can supply many components, and one component can be supplied by many suppliers.

Vehicle Component:

- Attributes: ComponentID (PK), Component_Name, Description, Price
- Explanation: Represents components used in vehicle manufacturing.
- Relationships: Many vehicle models use many components.

Supply Link (Associative Entity):

- Attributes: ComponentID+Supplier_ID (Composite Primary Key), Date_Supplied, Delivery Status

Vehicle Model:

- Attributes: Model_ID (PK), Model_Name, Release_Year, Price, Plant_ID (FK)
- Explanation: Represents specific vehicle models produced by Assembly Plant.
- Relationships: Each vehicle model is assembled at one assembly plant.

Model Component (Associative Entity):

- Attributes: Model_ID+ComponentID (Composite Primary Key), Quantity

Assembly Plant:

- Attributes: Plant_ID (PK), Location, Capacity, Manager_ID (FK)
- Explanation: Represents assembly plants where vehicles are assembled.
- Relationships: One manager can manage one or many assembly plants. (1:N)

Manager:

- Attributes: Manager_ID (PK), Name, Phone_Number
- Explanation: Represents automobile managers that manage assembly plants.
- Relationships: One manager can manage many assembly plants.

Order:

- Attributes: Order_ID (PK), Customer_ID (FK), Order_Date, Total_Price
- Explanation: Represents orders placed by customers for vehicle purchases.
- Relationships:
 - One customer can place many orders, and each order is placed by one customer.
 - Each order consists of one or more vehicle models.

Order Line (Associative Entity):

- Attributes: Model_ID+ Order_ID(Composite Primary Key), Quantity

Salesperson:

- Attributes: Salesperson_ID (PK), Name, Sales_Area, Commission_Rate, Salary
- Explanation: Represents salespersons involved in selling vehicles.
- Relationship: One salesperson handles many orders, but each order is handled by one salesperson.

Customer:

- Attributes: Customer_ID (PK), Name, City, State, Country, Phone_Number
- Explanation: Represents customers purchasing vehicles.
- Relationships: One customer can place many orders.

Sales Data:

- Attributes: Sales_ID (PK), Model_ID (FK), Plant_ID (FK), Sales_Date, Quantity_Sold, Revenue
- Explanation: Records sales transactions for vehicle models at assembly plants.
- Relationships: One assembly plant can have many sales data entries.

Customer Feedback:

- Attributes: Feedback_ID (PK), Customer_ID (FK), Date, Feedback_Description, Rating
- Explanation: Represents feedback provided by customers about their experiences.
- Relationships: One customer can provide multiple feedback entries, but each feedback entry is provided by one customer.

Changes compared to P2:

- 1) Supplier entity added to supply vehicle components/parts
- 2) Spare Parts renamed to Vehicle Components and corresponding attributes are updated
- 3) Spare Parts Inventory is removed
- 4) Supertype/subtype hierarchy removed
- 5) Assembly Line entity renamed to Assembly Plant and attributes updated
- 6) Manager entity added to manage Assembly Plant
- 7) Associative entities like Supply Link, Model Component and Order Line are added wherever many-to-many relationship existed.
- 8) Salesperson added to manage Sales and Sales entity removed
- 9) Customer entity updated
- 10) Customer Feedback entity added to manage customer feedback
- 11) Sales Data entity added to track performance of assembly plant and vehicle model
- 12) Entities like Manufactured Cars, Dealership, Marketing and Station are removed.