



# Implementation of Centralized Relational Database System at **Quantum Cars** **Phase - 1**

<b>1. BACKGROUND</b>	<b>3</b>
<b>2. PURPOSE</b>	<b>4</b>
<b>3. GOALS</b>	<b>5</b>
<b>4. BUSINESS RULES</b>	<b>6</b>
<b>5. LIST OF SUBJECTS</b>	<b>7</b>
<b>6. LIST OF TABLES</b>	<b>7</b>
<b>7. LIST OF ATTRIBUTES</b>	<b>8</b>
Table: Location	8
Table: Customer	8
Table: Salesperson	8
Table: Vehicle	8
Table: Deal	9
<b>8. ENTITY-RELATIONSHIP</b>	<b>10</b>
<b>APPENDIX</b>	<b>12</b>

# 1. BACKGROUND

Quantum Cars, an automotive dealership that started its operations more than thirty years ago and has three branches in Calgary, is a company that has distinguished itself in good customer relations and corporate social responsibilities. The passion for automobiles and the aim of offering customers satisfaction when they walk into the Quantum Cars showroom has been the foundation on which Quantum Cars has built and thrived. It operates from its mission statement to be a market leader in a dealership located in Calgary and values customer-centered approaches, integrity, innovation, teamwork, and community engagement; Quantum Cars is thus feeling the need to replace its current, less advanced database system. This modernization is meant to modernize data collaboration, decrease internal conflict, and increase customer satisfaction, knowing that the company remains dedicated to advancement and development in the automotive field.

## 2. PURPOSE

Implementing an advanced centralized relational database system at Quantum Cars is set to revolutionize the dealership's operations by delivering enhanced customer insights, boosting sales efficiency, and significantly increasing customer satisfaction through highly personalized experiences. This state-of-the-art system will enable seamless data integration across all dealership locations, facilitating real-time access to critical customer information. By leveraging sophisticated data analytics, Quantum Cars will acquire a more profound understanding of consumer inclinations and actions, allowing for more targeted marketing and tailored service offerings. The streamlined processes will reduce administrative overhead and enable sales teams to communicate with customers more efficiently, driving higher conversion rates and fostering long-term customer loyalty. Ultimately, this technological upgrade underscores Quantum Cars' commitment to innovation and excellence, ensuring every customer's superior and customized experience.

### 3. GOALS

**Flexibility and Scalability:** Quantum Cars needs to include this easy-to-develop system that could grow with the company, and based on the characteristics of this new system there should be no problem with increased data loads and users.

**Enhanced Vehicle Inventory Tracking:** Since tracking the status and location of each vehicle in different dealers on a real-time basis is essential for each company or brand, this system acts as a tool to improve vehicle inventory tracking.

**Integrated Communication Channels:** The database shall utilize integrated communication channels in the organization for network integration and operational synergy.

### 4. BUSINESS RULES

1. Sale date and delivery date: In the car industry, the sale date refers to when a customer agrees to purchase a vehicle, and the delivery date is when the customer takes the car home.
2. Deals are considered final only when the customer takes the car home. Salespeople receive credit and commission at this point to ensure successful transactions.
3. Up to two salespeople can receive credit for a vehicle sale, promoting collaboration and recognizing teamwork.
4. Salespeople can view, add, and update customer records, enabling personalized service and accurate data management.
5. Managers have control over reassigning customers, deleting records, adding vehicles, and managing the sales team, including hiring and removing salespeople.

## 5. LIST OF SUBJECTS

In designing the centralized database for Quantum Cars, we identified key subjects by analyzing the core operations of the dealership. These subjects are essential for effectively supporting the dealership's business processes.

1. Location - The dealership branches of Quantum Cars, each with unique identifiers and names.
2. Customer - Individuals purchasing or interacting with Quantum Cars, with detailed personal and contact information.
3. Employee - Staff members of Quantum Cars, including their roles, contact information, and hire dates.
4. Vehicle - Inventory items at Quantum Cars, including make, model, year, price, and other relevant details.
5. Deal - Transactions at Quantum Cars, linking customers, vehicles, salespersons, and locations with sale details.

## 6. LIST OF TABLES

These tables were finalized based on their critical roles in supporting the dealership's business processes, ensuring a comprehensive and efficient database design that addresses the operational needs of Quantum Cars.

1. Location : Store dealerships location details.
2. Customer : Stores information about the customers who make purchases.
3. Salesperson : Contains information about the salesperson.
4. Vehicle : Stores information about the vehicles available in inventory.
5. Deal - Records details of each sales transaction, including the customer, salesperson, sale date, total amount.

## 7. LIST OF ATTRIBUTES

After identifying the key tables for the Quantum Cars database, we proceeded to determine and finalize the attributes for each table. This process involved a detailed analysis of the information required to support the dealership's operations effectively.

### Table: Location

1. **Location\_ID (PK)**: Unique identifier for each dealership location.
2. **LocationName**: Name of the dealership location.

### Table: Customer

1. **Customer\_ID (PK)**: Unique identifier for each customer.
2. **CustFirstName**: Customer's first name.
3. **CustLastName**: Customer's last name.
4. **CustStreet**: Customer's street address.
5. **CustCity**: City where the customer resides.
6. **CustState**: State where the customer resides.
7. **CustZip**: ZIP code of the customer's address.
8. **CustPhone**: Customer's phone number.
9. **CustEmail**: Customer's email address.
10. **CustNotes**: Additional notes about the customer.

### Table: Salesperson

1. **Employee\_ID (PK)**: Unique identifier for each employee.
2. **Location\_ID (FK)**: References the dealership location where the employees work.
3. **FirstName**: Employee's first name.
4. **LastName**: Employee's last name.

### Table: Vehicle

1. **Vehicle\_ID (PK)**: Unique identifier for each vehicle.
2. **Location\_ID (FK)**: References the dealership location where the vehicle is stored.

3. **VehicleMake:** Make of the vehicle.
4. **VehicleModel:** Model of the vehicle.
5. **VehicleYear:** Year of the vehicle.
6. **NewOrUsed:** Indicates whether the vehicle is new or used.
7. **VehiclePrice:** Selling price of the vehicle.
8. **VehicleNotes:** Additional notes about the vehicle.

**Table: Deal**

1. **Deal\_ID (PK):** Unique identifier for each deal.
2. **Customer\_ID (FK):** References the customer involved in the deal.
3. **Vehicle\_ID (FK):** References the vehicle involved in the deal.
4. **Employee\_ID (FK):** References the employee involved in the deal.
5. **Location\_ID (FK):** References the dealership location where the deal took place.
6. **SalePrice:** The agreed sale price of the vehicle.
7. **DeliveryDate:** The delivery date of the vehicle to the customer.

## 8. ENTITY-RELATIONSHIP

After determining the tables and their respective attributes, we moved on to identifying and finalizing the relationships between these tables. This step was crucial to ensure data integrity and to reflect the real-world interactions within the dealership.

### ❖ Customers and Deals :

- Relationship: One-to-Many (One Customer to Many Deals)
- Definition: Each customer can participate in multiple deals, but each deal is associated with one customer.

### ❖ Locations and Employee

- Relationship: One-to-Many (One Location to Many Employees)
- Definition: Each location can have multiple employees working at it, but each employee is associated with one location.

### ❖ Locations and Vehicles

- Relationship: One-to-Many (One Location to Many Vehicles)
- Definition: Each location can have multiple vehicles stored or available, but each car is associated with one location.

### ❖ Salespersons and Deals

- Relationship: One-to-Many (One Salesperson to Many Deals)
- Definition: Each employee can facilitate multiple deals, but one employee facilitates each agreement.

### ❖ Locations and Deals

- Relationship: One-to-Many (One Location to Many Deals)
- Definition: Each location can host multiple deals, but each agreement takes place at one location.



## 9. CONCLUSION

Implementing an advanced centralized relational database system at Quantum Cars marks a significant milestone in enhancing operational efficiency and customer satisfaction. This state-of-the-art system provides the flexibility and scalability needed to support the dealership's growth, ensuring seamless management of increasing data volumes. Improved vehicle inventory tracking with real-time updates will streamline processes, reduce errors, and optimize stock levels. Integrated communication channels will enhance internal coordination and foster a cohesive work environment. Through these advancements, Quantum Cars reaffirms its commitment to innovation and superior customer experiences, solidifying its reputation as a leader in the automotive industry.

# APPENDIX

## DATA-DICTIONARY

1. **Location** - This table schema outlines fields for dealership location data, including unique identifiers, and location names. The **Location\_ID** serves as the primary key (PK) for each dealership location.

Field Name	Data Type	Description	Key
Location_ID	Integer	Unique identifier for each dealership location.	PK
LocationName	Varchar(255)	Descriptive name of the location.	

2. **Customer** - This table schema defines fields for customer data, including unique identifiers, first and last names, street address, city, state, ZIP code, phone number, email address, and notes. The **Customer\_ID** serves as the primary key (PK) for each customer.

Field Name	Data Type	Description	Key
Customer_ID	Integer	Unique identifier for each customer.	PK
CustFirstName	Varchar(255)	First name of the customer.	
CustLastName	Varchar(255)	Last name of the customer.	
CustStreet	Varchar(255)	Street address of the customer.	
CustCity	Varchar(255)	City where the customer resides.	
CustState	Varchar(50)	State where the customer resides.	
CustZip	Varchar(10)	ZIP code of the customer's address.	
CustPhone	Varchar(15)	Phone number of the customer.	
CustEmail	Varchar(255)	Email address of the customer.	
CustNotes	Text	Any additional information or notes about the customer.	

3. **Employee** - This table schema outlines fields for employee data, including unique identifiers, references to dealership locations, first names, and last names. The **Employee\_ID** serves as the primary key (PK) for each employee, while the **Location\_ID** is a foreign key (FK) referencing the dealership location where the employee works

Field Name	Data Type	Description	Key
Employee_ID	Integer	Unique identifier for each employee.	PK
Location_ID	Integer	References the dealership location where the employee works.	FK
FirstName	Varchar(255)	First name of the employee.	
LastName	Varchar(255)	Last name of the employee.	

4. **Vehicle** - This table schema defines fields for vehicle data, including unique identifiers, references to dealership locations, vehicle make, model, year, condition, selling price, and notes. The **Vehicle\_ID** serves as the primary key (PK) for each vehicle, while the **Location\_ID** is a foreign key (FK) referencing the dealership location where the vehicle is stored.

Field Name	Data Type	Description	Key
Vehicle_ID	Integer	Unique identifier for each vehicle.	PK
Location_ID	Integer	References the dealership location where the vehicle is stored.	FK
VehicleMake	Varchar(255)	Make of the vehicle.	
VehicleModel	Varchar(255)	Model of the vehicle.	
VehicleYear	Integer	Year of the vehicle.	
NewOrUsed	Varchar(10)	Specifies if the vehicle is new or used.	
VehiclePrice	Decimal(10, 2)	Selling price of the vehicle.	
VehicleNotes	Text	Any additional information or notes about the vehicle.	

5. **Deal** - This table schema outlines fields for deal data, including unique identifiers (**Deal\_ID**), references to customers, vehicles, employees, and dealership locations involved in the deal. Other fields include the agreed sale price of the vehicle (**SalePrice**) and the delivery date of the vehicle to the customer (**DeliveryDate**). The **Deal\_ID** serves as the primary key (**PK**) for each deal, while the other fields are foreign keys (**FK**) referencing related entities.

Field Name	Data Type	Description	Key
Deal_ID	Integer	Unique identifier for each deal.	PK
Customer_ID	Integer	References the customer involved in the deal.	FK
Vehicle_ID	Integer	References the vehicle involved in the deal.	FK
Employee_ID	Integer	References the Employee involved in the deal.	FK
Location_ID	Integer	References the dealership location where the deal took place.	FK
SalePrice	Decimal(10, 2)	The agreed sale price of the vehicle.	
DeliveryDate	Date	The delivery date of the vehicle to the customer.	

**THANK YOU**