

Phase 3: Data Modeling & Relationships

This phase defines how **data is structured and connected** in the Smart Vehicle CRM project. It covers **custom objects, fields, relationships, page layouts, and schema builder visualization**.

1. Standard & Custom Objects

We used both **standard objects** (User, Contact) and **custom objects** created specifically for vehicle service management.

Standard Objects Used

- **User** → Used for Created By, Last Modified By, Owner relationships.
- **Contact** → Represents customers linked to vehicles and service requests.
- **Group** → Owners can also be public groups for better sharing.

Custom Objects Created:

- **Vehicle__c** → Stores customer vehicle details.
 - **Service_Request__c** → Tracks service bookings and status.
 - **Technician__c** → Holds technician details.
 - **Parts_Inventory__c** → Manages spare parts & stock.
 - **Service_Parts_Used__c** → Junction object between Service Request & Parts.
 - **Invoice__c** → Handles billing and payments.
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2. Fields per Object

Service_Request__c

Field Label	API Name	Data Type	Description
Service Request Name	Name	Auto Number	Unique identifier for request
Customer	Customer__c	Lookup(Contact)	Links request to customer
Vehicle	Vehicle__c	Lookup(Vehicle__c)	Vehicle being serviced
Technician	Technician__c	Lookup(Technician__c)	Assigned technician
Priority	Priority__c	Picklist	Service urgency
Service Date	Service_Date__c	Date	Scheduled service date
Status	Status__c	Picklist	Request progress

Field Label	API Name	Data Type	Description
Type	Type__c	Picklist	Type of service (Repair/Maintenance)
Owner	OwnerId	Lookup(User,Group)	Record ownership
Created By	CreatedById	Lookup(User)	Audit field
Last Modified By	LastModifiedById	Lookup(User)	Audit field

Service_Parts_Used__c (Junction Object)

Field Label	API Name	Data Type	Description
Service Parts Used Name	Name	Auto Number	Unique identifier
Service Request	Service_Request__c	Master-Detail(Service_Request__c)	Links to service request
Part	Part__c	Master-Detail(Parts_Inventory__c)	Part consumed
Quantity Used	Quantity_Used__c	Number(18,0)	Number of units used
Created By	CreatedById	Lookup(User)	Audit field
Last Modified By	LastModifiedById	Lookup(User)	Audit field

Vehicle__c

Field Label	API Name	Data Type	Description
VIN	Name	Text(80)	Vehicle unique ID
Customer	Customer__c	Lookup(Contact)	Vehicle owner
Make	Make__c	Text(20)	Manufacturer
Model	Model__c	Text(20)	Model name
Year	Year__c	Number(18,0)	Manufacturing year
Last Service Date	Last_Service_Date__c	Date	Previous service date
Owner	OwnerId	Lookup(User,Group)	Record ownership
Created By	CreatedById	Lookup(User)	Audit field
Last Modified By	LastModifiedById	Lookup(User)	Audit field

Technician__c

Field Label	API Name	Data Type	Description
Technician Name	Name	Text(80)	Technician's name
User	User__c	Lookup(User)	Linked Salesforce user
Skills	Skills__c	Text Area(255)	Technician skills
Availability	Availability__c	Picklist	Available/Busy/On Leave
Owner	OwnerId	Lookup(User,Group)	Record ownership
Created By	CreatedById	Lookup(User)	Audit field
Last Modified By	LastModifiedById	Lookup(User)	Audit field

Invoice__c

Field Label	API Name	Data Type	Description
Invoice Name	Name	Auto Number	Unique invoice identifier
Service Request	Service_Request__c	Lookup(Service_Request__c)	Linked request
Amount	Amount__c	Currency(18,0)	Total amount
Status	Status__c	Picklist	Draft / Approved / Paid
Owner	OwnerId	Lookup(User,Group)	Record ownership
Created By	CreatedById	Lookup(User)	Audit field
Last Modified By	LastModifiedById	Lookup(User)	Audit field

Parts_Inventory__c

Field Label	API Name	Data Type	Description
Part Number	Name	Text(80)	Unique part identifier
Name	Name__c	Text(20)	Part name
Cost	Cost__c	Currency(18,0)	Cost of the part
Stock	Stock__c	Number(18,0)	Available stock quantity
Reorder Level	Reorder_Level__c	Number(18,0)	Minimum stock before reordering
Owner	OwnerId	Lookup(User,Group)	Record ownership
Created By	CreatedById	Lookup(User)	Audit field
Last Modified By	LastModifiedById	Lookup(User)	Audit field

3. Record Types

- **Service Request** → (Repair, Maintenance, Inspection).

- **Invoice** → (Proforma, Final).
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4. Page Layouts & Compact Layouts

- **Service Request Layout:** Customer, Vehicle, Technician, Status, Priority.
- **Vehicle Layout:** VIN, Make, Model, Last Service Date.
- **Technician Layout:** Name, Skills, Availability.
- **Invoice Layout:** Service Request, Amount, Status.
- **Parts Inventory Layout:** Part Number, Cost, Stock, Reorder Level.

Compact layouts created for **quick views** (Name, Status, Amount, Stock).

5. Relationships

- **Vehicle__c** → **Contact** = Lookup (each vehicle belongs to a customer).
- **Service_Request__c** → **Vehicle__c** = Lookup (each service request belongs to a vehicle).
- **Service_Request__c** → **Technician__c** = Lookup (assigned technician).
- **Service_Parts_Used__c** → **Service_Request__c** & **Parts_Inventory__c** = **Master-Detail (Junction Object)**.
- **Invoice__c** → **Service_Request__c** = Lookup (invoice generated for a request).

6. Junctional Objects

In **Smart Vehicle CRM**, we created the junction object:

Service_Parts_Used__c

- **Purpose:** To track which parts were used in which service request.
- This enables a **many-to-many relationship** between:
 - **Service_Request__c** (service activity on a vehicle)
 - **Parts_Inventory__c** (spare parts available in stock)
- A **Service Request** can have **multiple parts used**.
- A **Part** can be used in **multiple service requests**.

- The **junction object** (**Service_Parts_Used__c**) allows us to store this many-to-many mapping. **Example Scenario**

1. Service Request **SR-001** (Brake Service) used:
 - Brake Pad (2 units)
 - Engine Oil (1 unit)
2. Service Request **SR-002** (Full Service) used:
 - Brake Pad (1 unit)
 - Air Filter (1 unit)

Here, **Brake Pad** is linked to both **SR-001** and **SR-002**, which is only possible because of the **junction object**.

7. Schema Builder Representation

- Central object = **Service_Request__c**.
- Connected to **Vehicle__c** (Lookup), **Technician__c** (Lookup), **Invoice__c** (Lookup).
- **Service_Parts_Used__c** acts as a **junction object** between Service Request and Parts Inventory.
- All objects ultimately link back to **Contact (Customer)** for CRM context.