

Project Design Phase

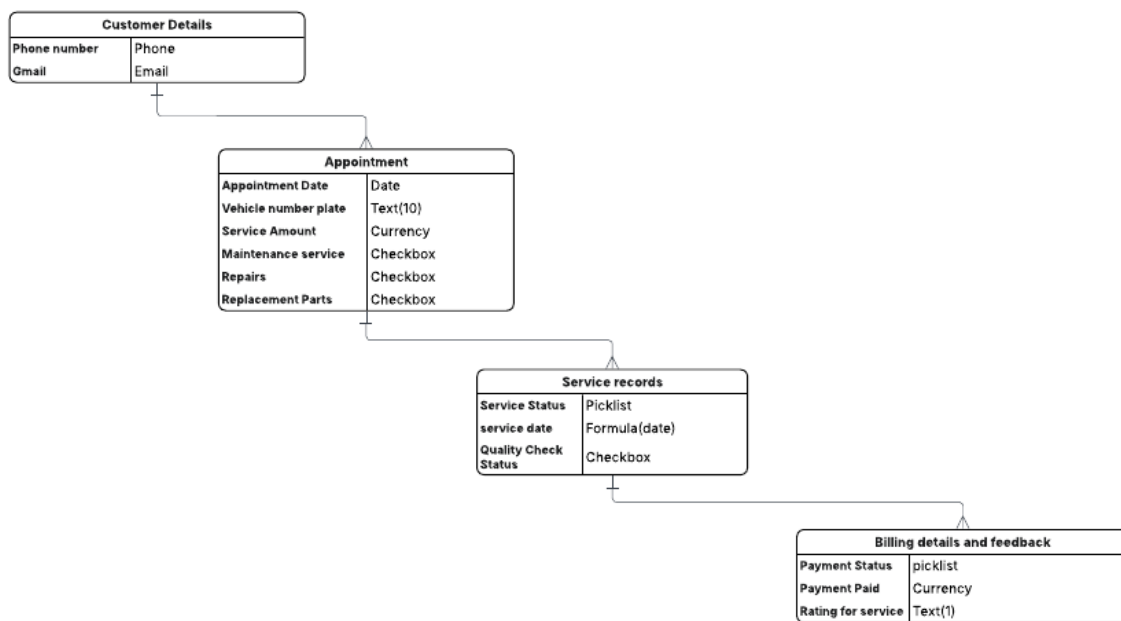
Data Model Design

Date	25 October 2025
Team ID	NM2025TMID02695
Project Name	Garage Management system
Maximum Mark	4 Marks

4.1 Data Model Design

The GMS data model follows a **hierarchical relationship structure** connecting customer, appointment, service, and billing entities. This enables end-to-end traceability of every service performed within the garage.

4.1.1 Entity-Relationship Diagram (ERD)



Relationship Flow Explanation:

1. Customer Details → Appointment (Lookup Relationship):

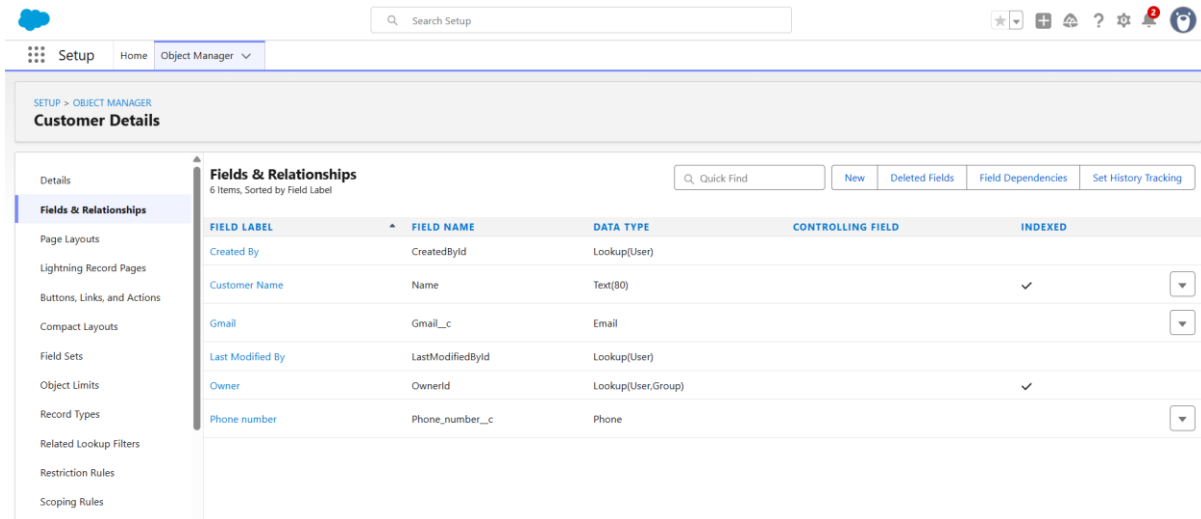
- One customer can have multiple appointments for different vehicles or service dates.
- Implemented using a *Lookup Relationship* from Appointment to Customer Details.

2. Appointment → Service Records (Lookup Relationship):

- Each appointment can generate multiple service records based on work items (e.g., oil change, tire replacement).
- This allows tracking each service independently.

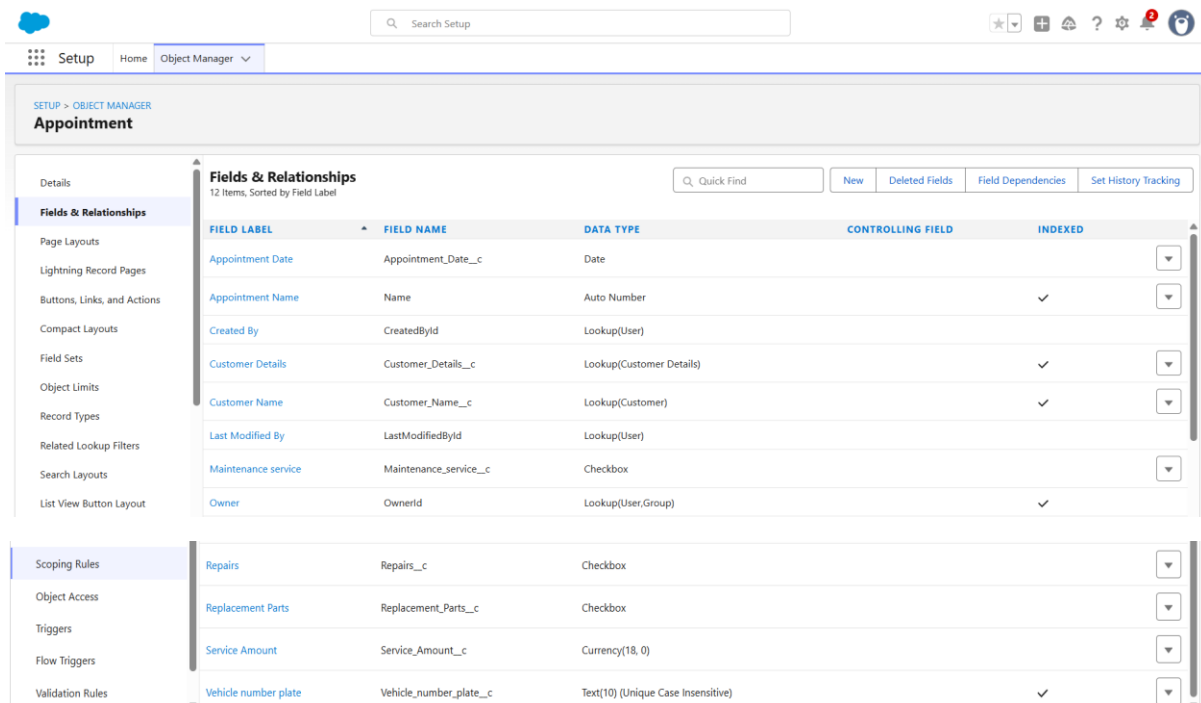
3. Service Records → Billing Details (Lookup Relationship):

- A service record can have one or more associated billing entries to capture payments and ratings.
- This supports financial closure and feedback collection.



The screenshot shows the Salesforce Setup interface for the 'Customer Details' object. The 'Fields & Relationships' tab is selected, displaying a table of 6 fields. The table has columns for Field Label, Field Name, Data Type, Controlling Field, and Indexed. The fields listed are: Created By (Lookup(User)), Customer Name (Text(80)), Gmail (Email), Last Modified By (Lookup(User)), Owner (Lookup(User,Group)), and Phone number (Phone).

FIELD LABEL	FIELD NAME	DATA TYPE	CONTROLLING FIELD	INDEXED
Created By	CreatedById	Lookup(User)		
Customer Name	Name	Text(80)		✓
Gmail	Gmail__c	Email		
Last Modified By	LastModifiedById	Lookup(User)		
Owner	OwnerId	Lookup(User,Group)		✓
Phone number	Phone_number__c	Phone		



The screenshot shows the Salesforce Setup interface for the 'Appointment' object. The 'Fields & Relationships' tab is selected, displaying a table of 12 fields. The table has columns for Field Label, Field Name, Data Type, Controlling Field, and Indexed. The fields listed are: Appointment Date (Date), Appointment Name (Auto Number), Created By (Lookup(User)), Customer Details (Lookup(Customer Details)), Customer Name (Lookup(Customer)), Last Modified By (Lookup(User)), Maintenance service (Checkbox), Owner (Lookup(User,Group)), Repairs (Checkbox), Replacement Parts (Checkbox), Service Amount (Currency(18, 0)), and Vehicle number plate (Text(10) (Unique Case Insensitive)).

FIELD LABEL	FIELD NAME	DATA TYPE	CONTROLLING FIELD	INDEXED
Appointment Date	Appointment_Date__c	Date		
Appointment Name	Name	Auto Number		✓
Created By	CreatedById	Lookup(User)		
Customer Details	Customer_Details__c	Lookup(Customer Details)		✓
Customer Name	Customer_Name__c	Lookup(Customer)		✓
Last Modified By	LastModifiedById	Lookup(User)		
Maintenance service	Maintenance_service__c	Checkbox		
Owner	OwnerId	Lookup(User,Group)		✓
Repairs	Repairs__c	Checkbox		
Replacement Parts	Replacement_Parts__c	Checkbox		
Service Amount	Service_Amount__c	Currency(18, 0)		
Vehicle number plate	Vehicle_number_plate__c	Text(10) (Unique Case Insensitive)		✓

Setup

Home

Object Manager

SETUP > OBJECT MANAGER

Service records

Details

Fields & Relationships

Page Layouts

Lightning Record Pages

Buttons, Links, and Actions

Compact Layouts

Field Sets

Object Limits

Record Types

Related Lookup Filters

Search Layouts

List View Button Layout

Restriction Rules

Scoping Rules

Object Access

Fields & Relationships

10 Items, Sorted by Field Label

Quick Find

New

Deleted Fields

Field Dependencies

Set History Tracking

FIELD LABEL	FIELD NAME	DATA TYPE	CONTROLLING FIELD	INDEXED	
Appointment	Appointment__c	Lookup(Appointment)		✓	
Created By	CreatedById	Lookup(User)			
Created Date	Created_Date__c	Date			
Last Modified By	LastModifiedById	Lookup(User)			
Owner	OwnerId	Lookup(User,Group)		✓	
Payment Status	Payment_Status__c	Picklist			
Quality Check Status	Quality_Check_Status__c	Checkbox			
service date	service_date__c	Formula (Date)			
Service records Name	Name	Auto Number		✓	
Service Status	Service_Status__c	Picklist			

Setup

Home

Object Manager

SETUP > OBJECT MANAGER

Billing details and feedback

Details

Fields & Relationships

Page Layouts

Lightning Record Pages

Buttons, Links, and Actions

Compact Layouts

Field Sets

Object Limits

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Search Layouts

List View Button Layout

Restriction Rules

Fields & Relationships

8 Items, Sorted by Field Label

Q Quick Find

New

Deleted Fields

Field Dependencies

Set History Tracking

FIELD LABEL	FIELD NAME	DATA TYPE	CONTROLLING FIELD	INDEXED
Billing details and feedback Name	Name	Auto Number		✓
Created By	CreatedById	Lookup(User)		
Last Modified By	LastModifiedById	Lookup(User)		
Owner	OwnerId	Lookup(User,Group)		✓
Payment Paid	Payment_Paid__c	Currency(18, 0)		
Payment Status	Payment_Status__c	Text(10) (Unique Case Insensitive)		✓
Rating for service	Rating_for_service__c	Text(1)		
Service records	Service_records__c	Lookup(Service records)		✓

4.1.2 Data Integrity Design

Ensuring accurate and consistent data is central to maintaining quality within GMS. Several **Validation Rules**, **Lookup Filters**, and **Field-Level Constraints** were implemented.

Control Type	Target Object	Purpose	Implementation Details
Validation Rule 1	Appointment	Enforces the correct 10-character vehicle number plate format.	<code>NOT (REGEX (Vehicle_number_plate__c, "[A-Z]{2}[0-9]{2}[A-Z]{2}[0-9]{4}"))</code>
Validation Rule 2	Billing Details	Ensures service rating is a single digit between 1 and 5.	<code>NOT (REGEX (Rating_for_service__c, "[1-5]{1}"))</code>

Validation Rule 3 <i>(optional)</i>	Service Records	Prevents record creation unless an Appointment is linked.	ISBLANK (Appointment__c)
Lookup Filter	Service Records → Appointment	Allows linking only valid appointments (scheduled in the past).	Appointment Date < TODAY()
Required Fields	Across all objects	Enforces data completeness.	Phone, Email (Customer); Vehicle No. (Appointment); Service Status (Service Records).

Integrity Rationale:

These controls ensure that all entered data adheres to real-world garage operation logic and prevents incomplete or inconsistent entries from affecting reporting accuracy.