

Project Design Phase

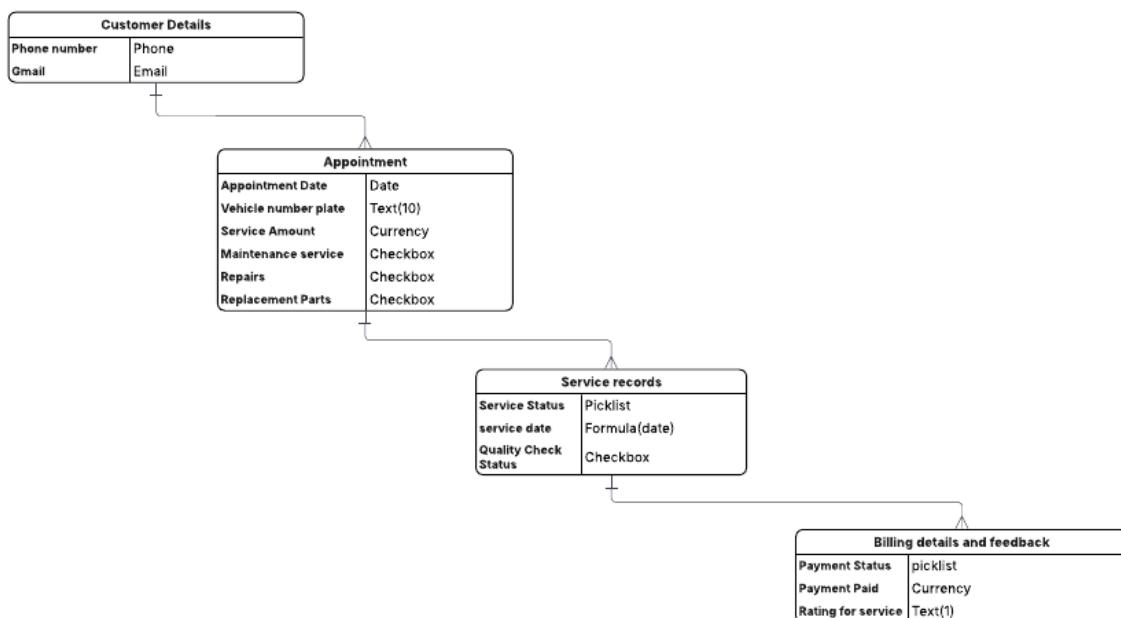
Data Model Design

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 image contains two screenshots of the Salesforce Object Manager interface, showing the 'Fields & Relationships' section for two different objects: 'Customer Details' and 'Appointment'.

Screenshot 1: Customer Details Fields & Relationships

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		

Screenshot 2: Appointment Fields & Relationships

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)		✓

Below the tables, there are additional sections for Scoping Rules, Object Access, Triggers, Flow Triggers, and Validation Rules.

Service records

Fields & Relationships

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)		

Restriction Rules

Service records Name	Name	Auto Number	✓
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Scoping Rules

Service Status	Service_Status__c	Picklist	
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Object Access

Billing details and feedback

Fields & Relationships

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.	NOT (REGEX(Vehicle_number_plate__c, "[A-Z]{2}[0-9]{2}[A-Z]{2}[0-9]{4}"))
Validation Rule 2	Billing Details	Ensures service rating is a single digit between 1 and 5.	NOT (REGEX(Rating_for_service__c, "[1-5]{1}"))

Validation Rule 3 (optional)	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.