Garage Management system

1.Project Overview

This project focuses on developing a **Garage Management System (GMS)**, designed to address the challenges of managing automotive repair facilities effectively.

The goal is to deliver a comprehensive solution by leveraging **modern software technologies** to streamline operations, improve service delivery, and enhance customer satisfaction.

Through this project, we aim to boost **operational efficiency, improve resource management, and ensure seamless interactions between customers and staff**, supporting the long-term growth and success of automotive repair businesses.

2.Objectives

Business Goals

1. **Streamline Operations**: Automate tasks like scheduling, billing, and inventory tracking.
2. **Enhance Customer Satisfaction**: Offer online booking, real-time updates, and digital invoicing.
3. **Optimize Resource Management**: Efficiently manage staff, tools, and spare parts.
4. **Boost Growth**: Improve analytics for data-driven decisions and business expansion.
5. **Ensure Data Security**: Safeguard customer and business data.

Specific Outcomes

1. User-friendly customer and staff interface.
2. Automated appointment scheduling and notifications.
3. Real-time inventory and repair workflow tracking.
4. Role-based access and secure payment integration.
5. Comprehensive reports and customer feedback system.

3.Salesforce Key Features and Concepts Utilized

1. **Custom Objects and Fields**
    - Created custom objects such as "Customer Details," "Appointments," "Service Records," and "Billing Details and Feedback" to capture specific data relevant to the Garage Management System.
    - Implemented custom fields to store detailed information and facilitate unique data collection.
2. **Validation Rules**
    - Established validation rules to ensure data integrity and accuracy. Examples include verifying vehicle license plate formats and rating inputs.
3. **Workflow Automation**
    - Utilized Salesforce Flows to automate business processes such as updating records and sending automated emails.
    - Record-triggered flows were designed to respond to changes in data, streamlining operations and reducing manual tasks.
4. **Apex Programming**
    - Developed Apex classes and triggers to handle complex business logic. For instance, the "AmountDistributionHandler" class was created to automate service amount distribution based on selected services.
    - Implemented triggers to execute specific actions before or after record operations.
5. **Profiles and Roles**
    - Configured various user profiles (e.g., Manager, Salesperson) to manage access controls and ensure role-based data visibility.
    - Created roles to establish hierarchical data access and reporting structures.
6. **Duplicate and Matching Rules**
    - Applied duplicate and matching rules to prevent data redundancy and maintain clean customer records.
    - Matching criteria were set for fields such as email and phone numbers to identify potential duplicates.
7. **Lightning App Builder**
    - Designed a custom Lightning App for the Garage Management System to provide a user-friendly interface.
    - Added navigation items and utility bars to enhance user experience and accessibility.
8. **Reports and Dashboards**
    - Created actionable reports and dashboards to provide insights into key metrics such as appointment trends, payment statuses, and customer feedback.
    - Enabled data-driven decision-making through real-time analytics.
9. **Email Alerts and Notifications**
    - Configured automated email alerts to keep customers informed about their service

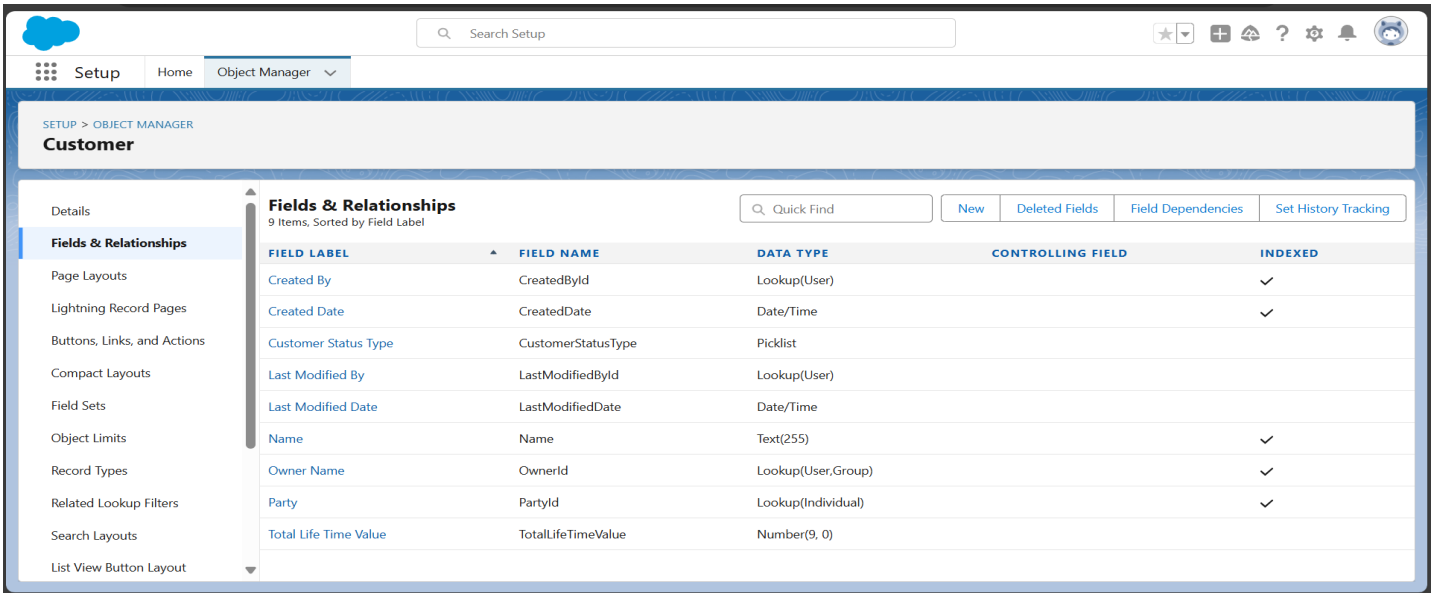
status and payment confirmations.
- Utilized text templates for personalized communication.

10. **Testing and Validation**
    - Conducted comprehensive unit testing for Apex classes and triggers to ensure robust functionality.
    - Performed user interface testing to validate the seamless interaction and correct operation of all customizations.

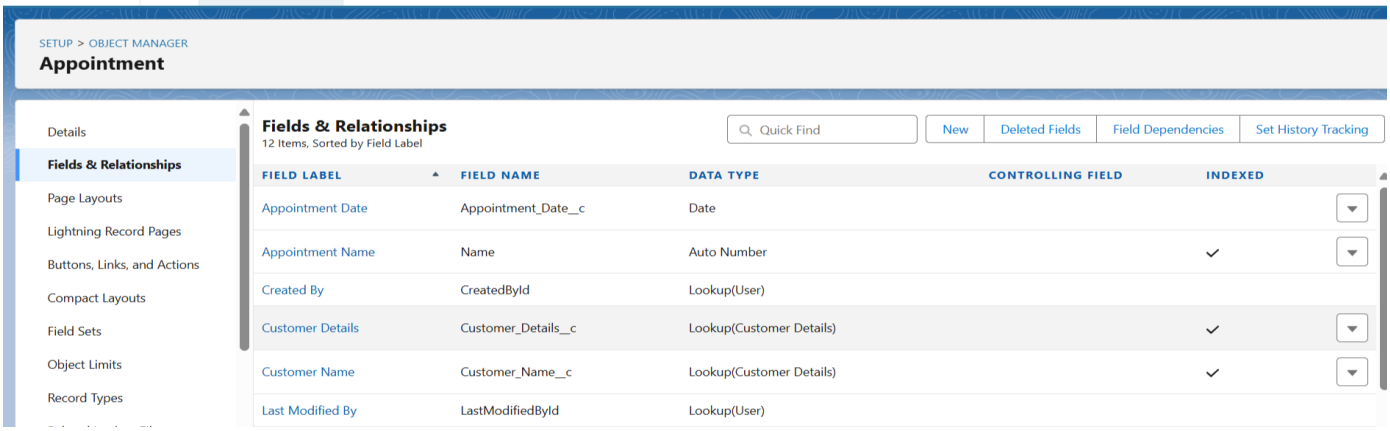
4.Detailed Steps to Solution Design

1. Data Models

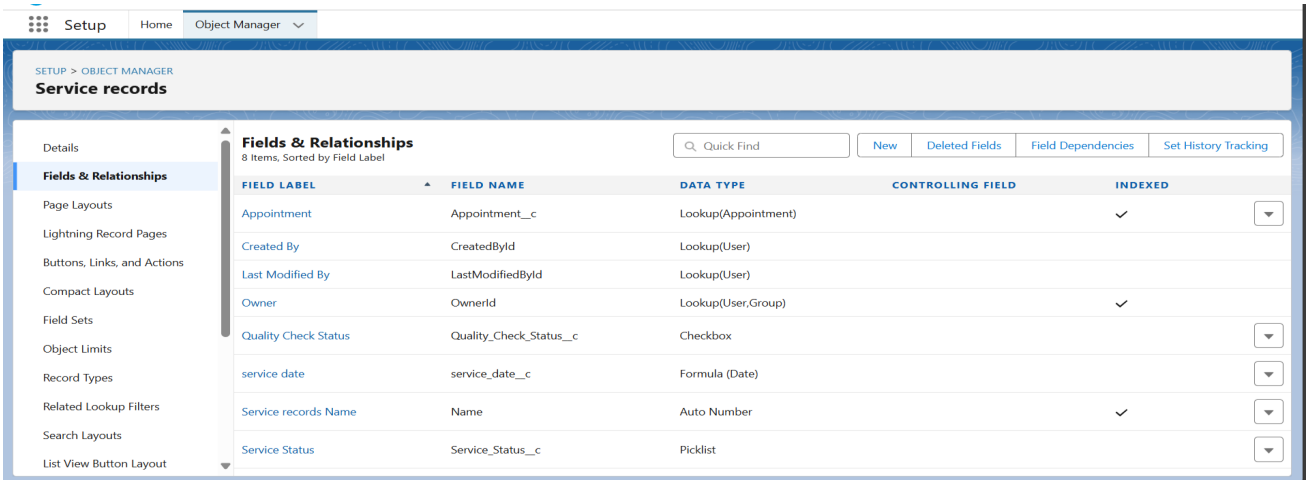
- **Customer Details Object**: Designed to capture customer-specific information such as name, phone number, and email.



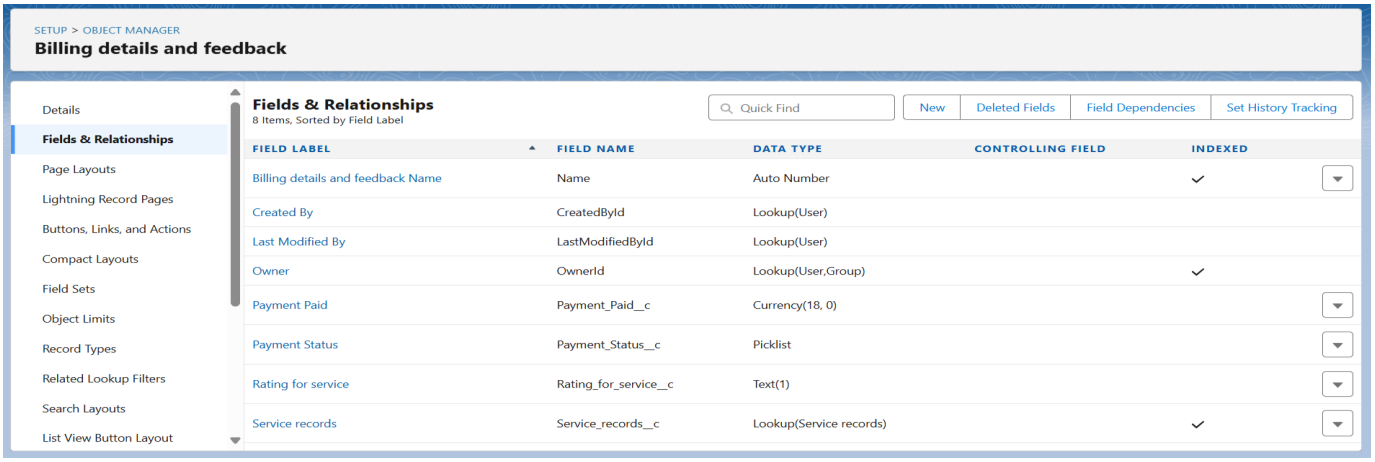
- **Appointments Object**: Structured to record appointment schedules, associated customers, vehicle details, and service types



- **Service Records Object**: Tracks the details of services provided, including parts replaced and maintenance performed.



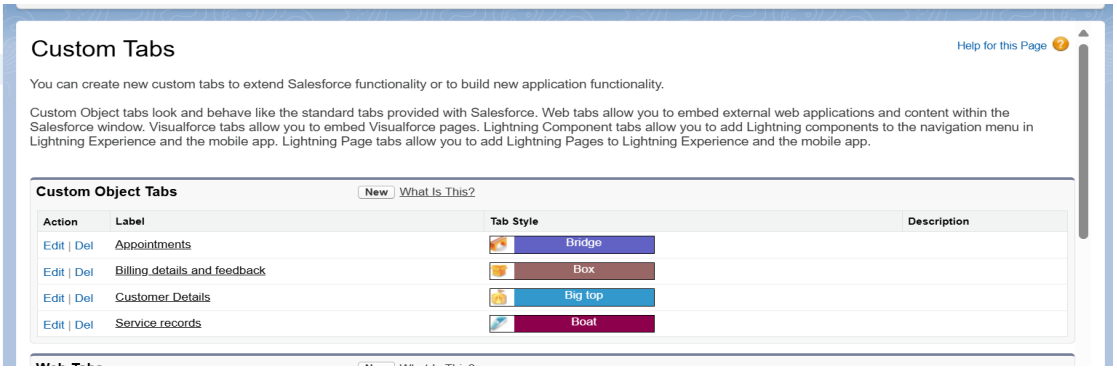
- **Billing Details and Feedback Object**: Manages billing information, payment statuses, and customer feedback.



2. User Interface Designs

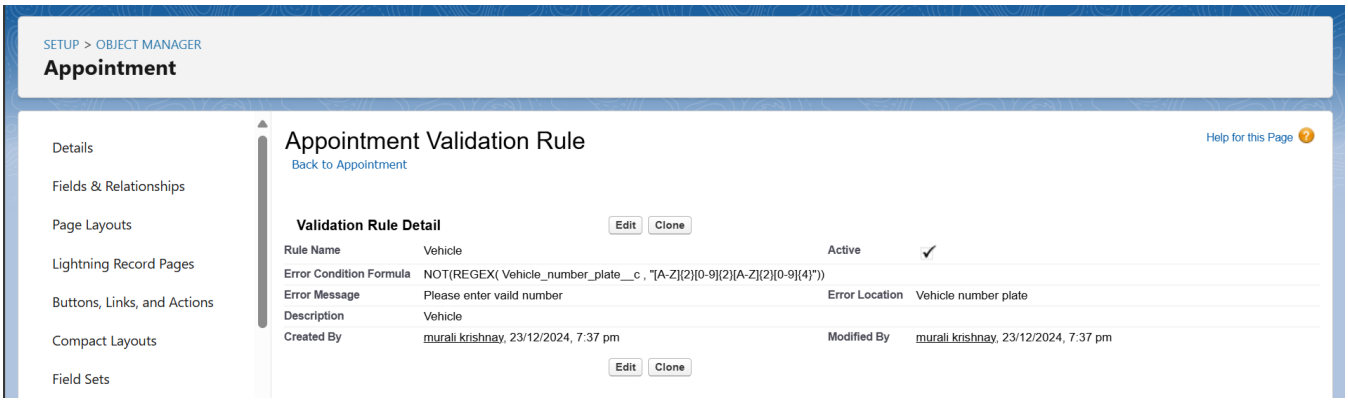
Garage Management App:

- Custom app configured as default for Manager and Salesperson profiles.
- Includes tabs for: **Appointments, Service RecordsBilling Details and Feedback and Dashboard for analytics**.

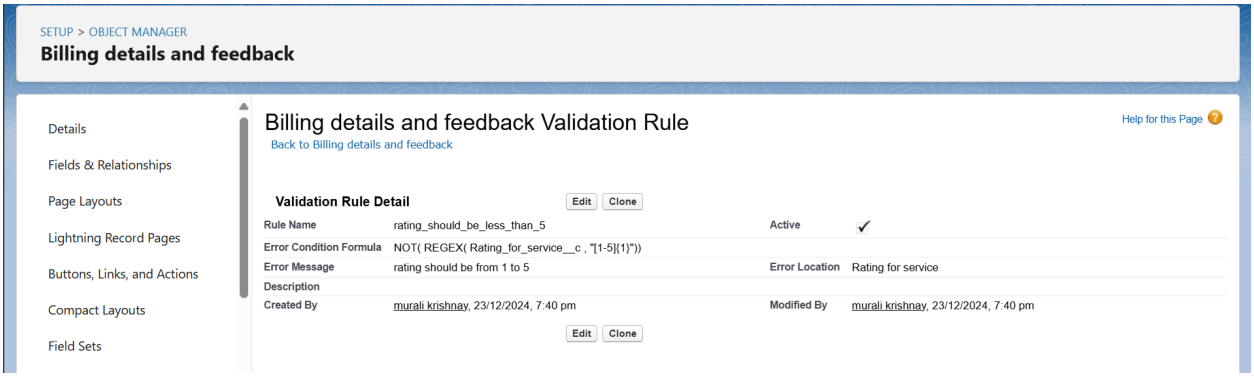


3. Business Logic

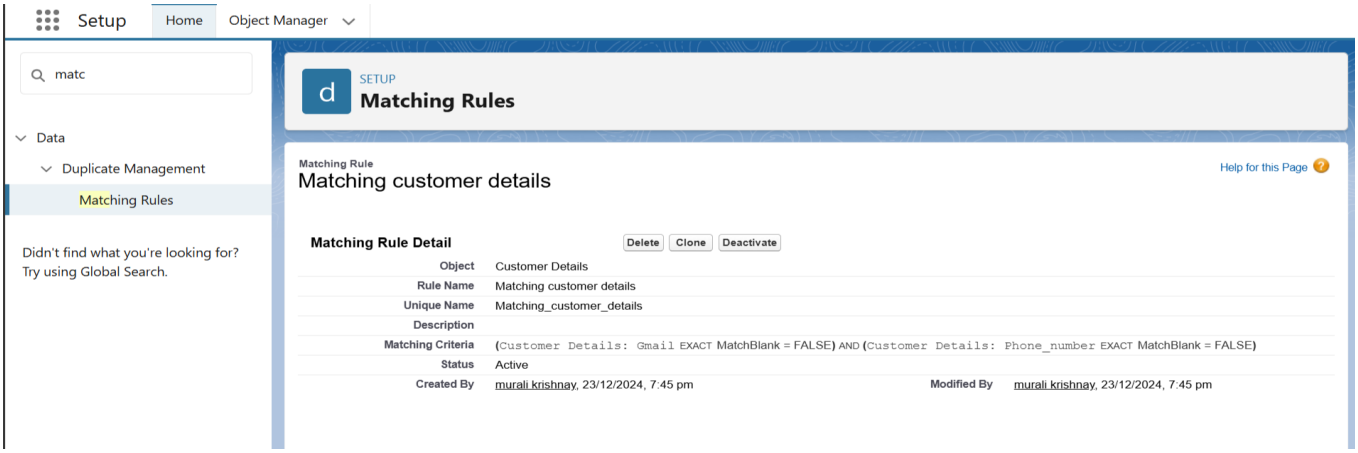
- **Validation Rules**: Ensured data integrity with rules like validating vehicle number formats and service ratings.



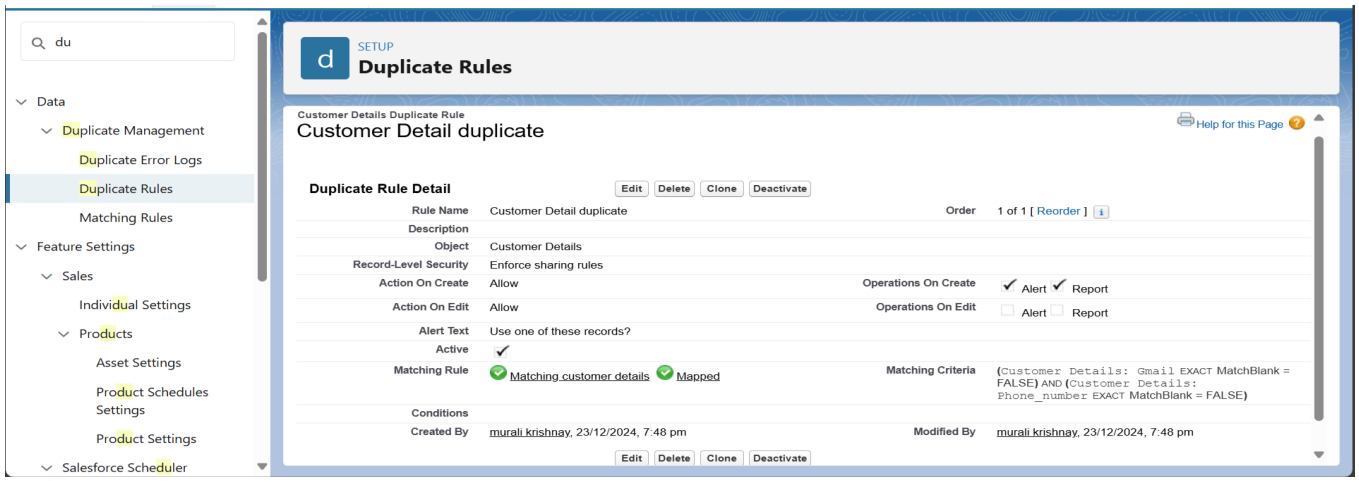
- **Validation rule to an Billing details and feedback Object:**This rule ensures that the **Rating for Service** field only accepts values between 1 and 5



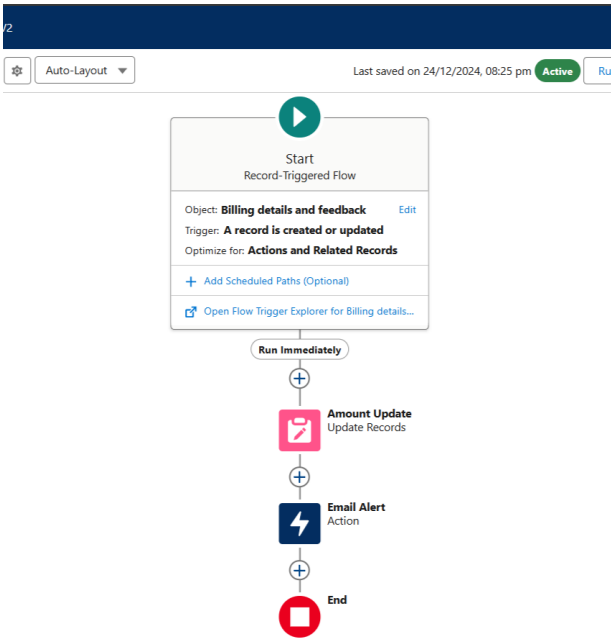
- **Matching rule to an Customer details Object:** The matching rule ensures accurate identification of duplicate records in the **Customer Details** object

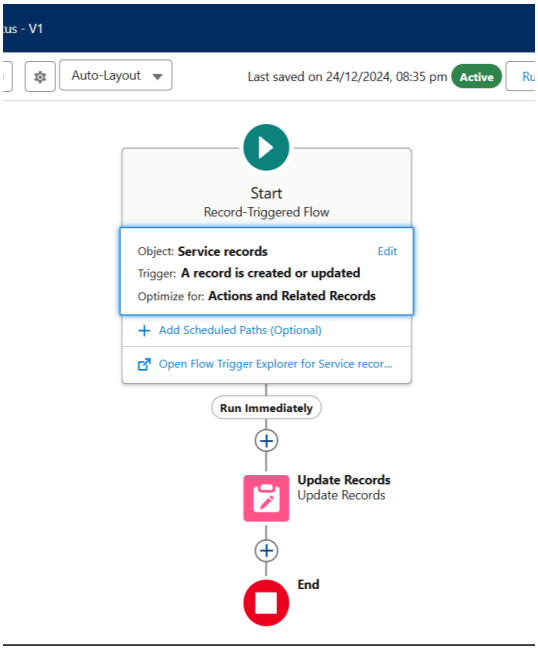


- **Duplicate Rule for Customer** Details is created and active, helping to maintain data integrity by identifying and handling duplicate records.



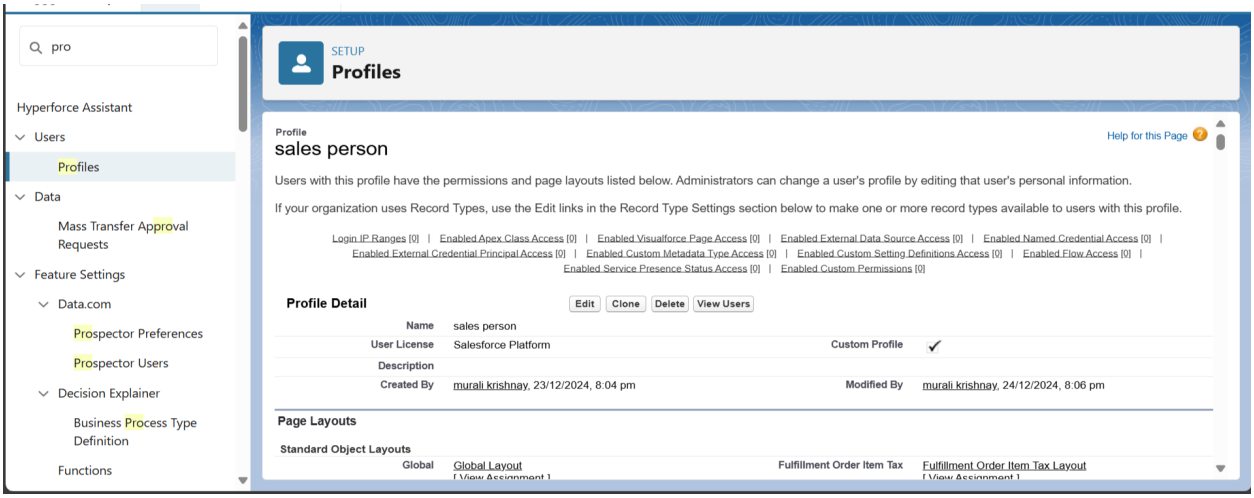
- **Workflow Automations**:
  - **Record-Triggered Flows**: Automated updates and email notifications based on changes in records.

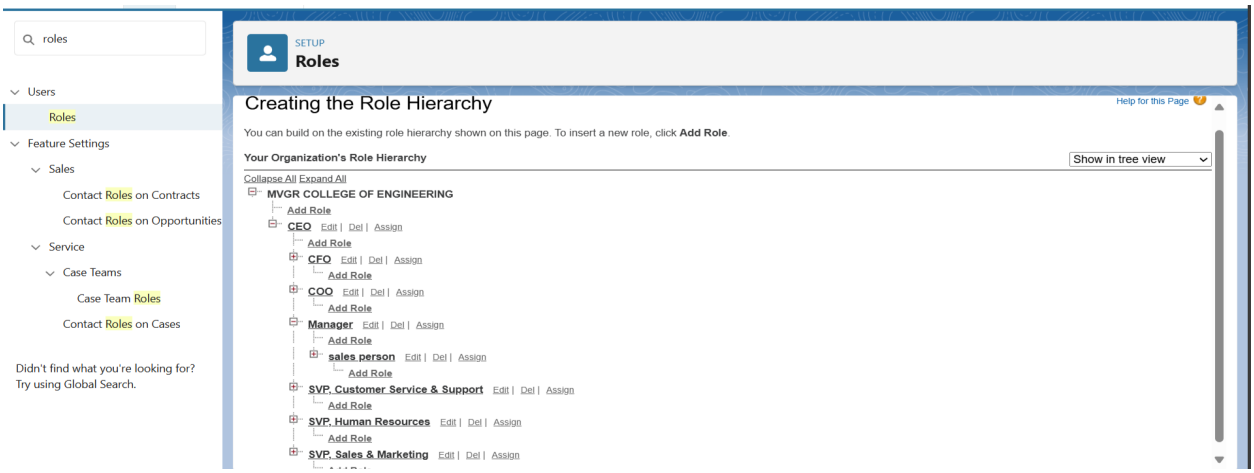




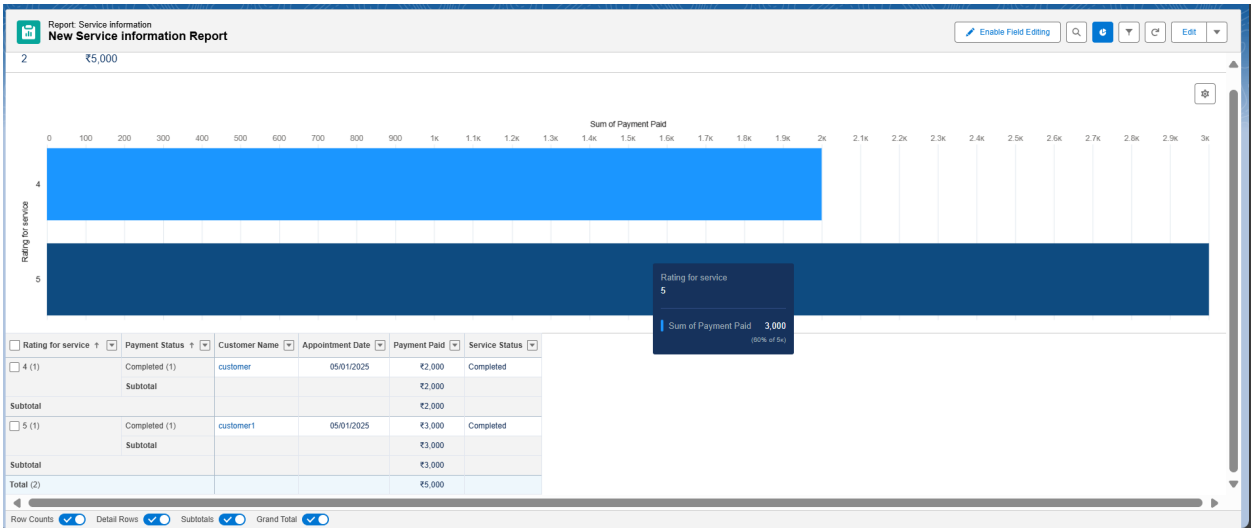
  - **Apex Triggers**: Custom logic for **calculating service amounts** and updating payment statuses.

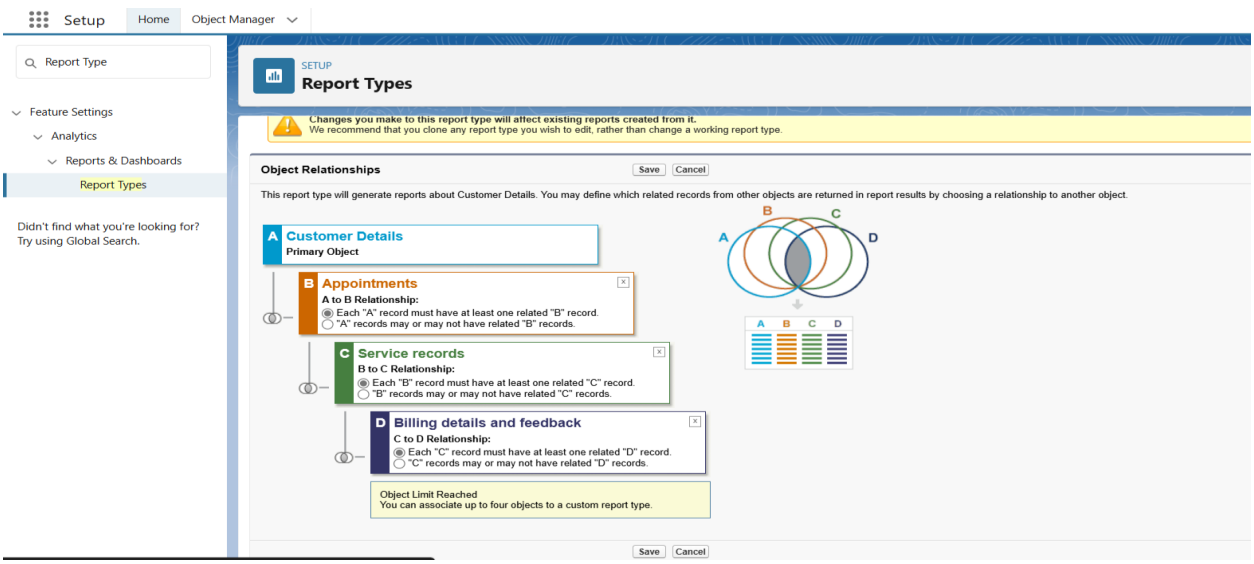
4. **Security and Access Control**
    - **Profiles and Roles**: Configured to ensure appropriate access levels for Managers and Salespersons.
    - **Field-Level Security**: Protected sensitive information with customized permissions.

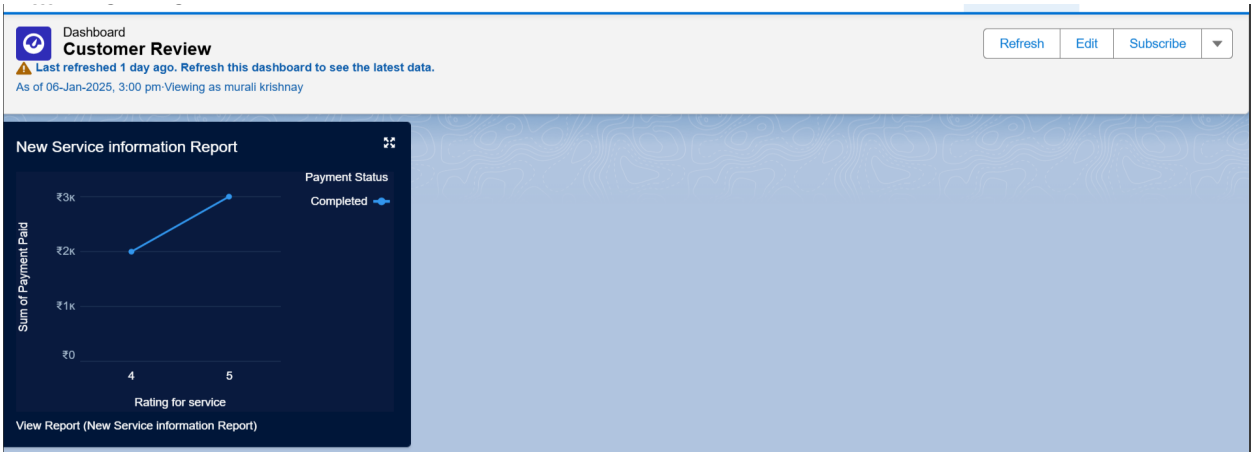


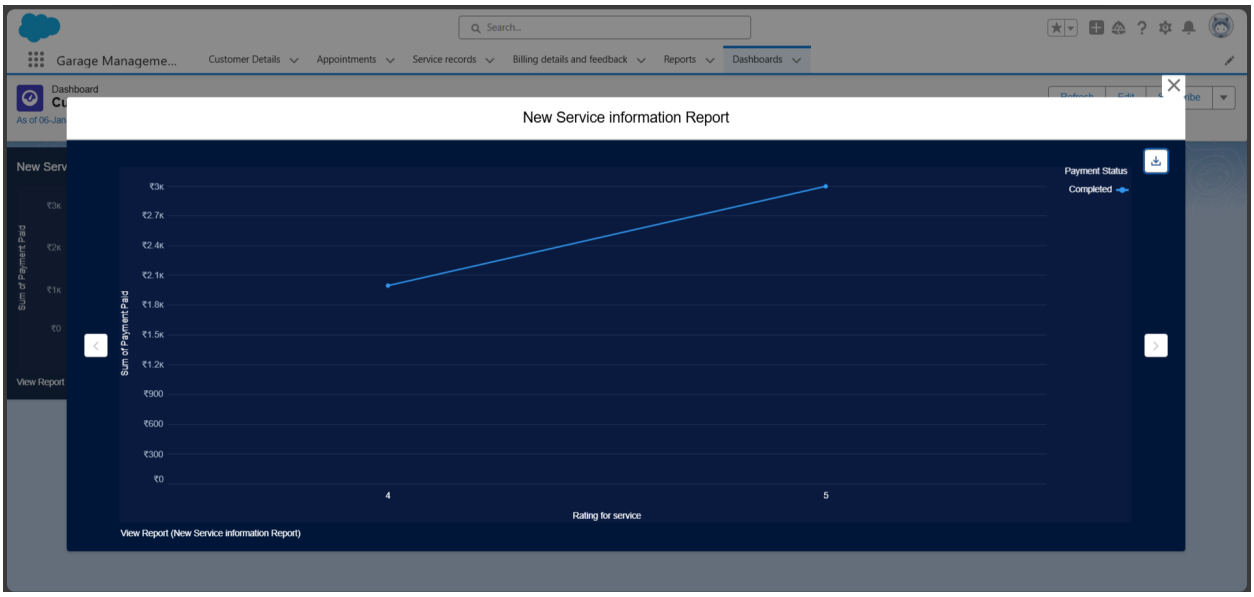


5. Reports and Dashboards









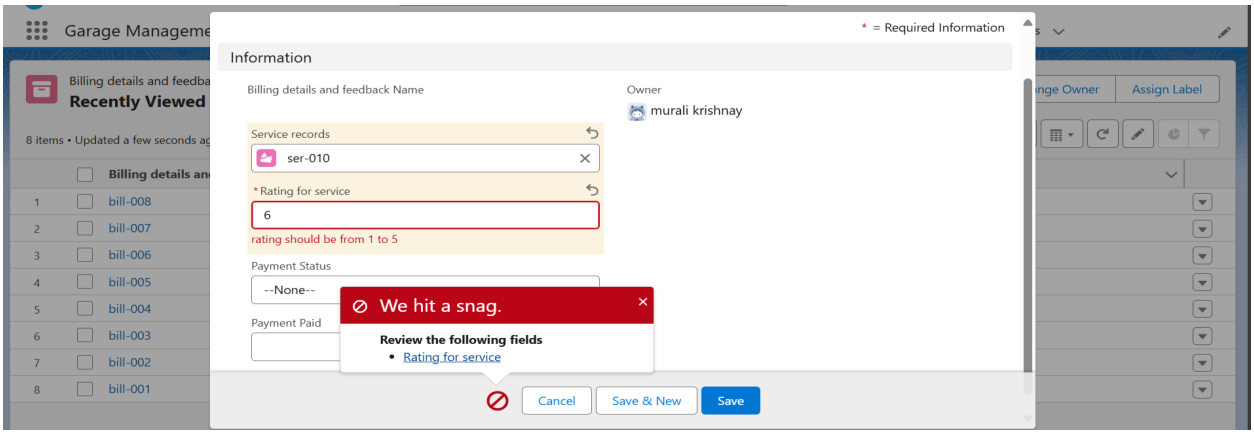
All Those steps ensure a comprehensive solution design, aligning all components to deliver a robust Garage Management System.

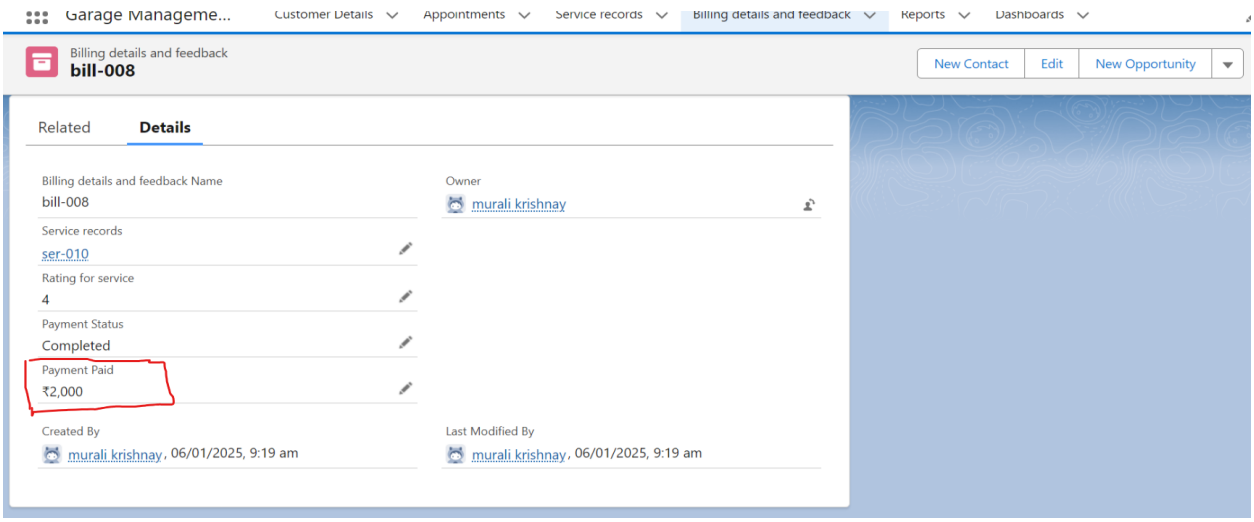
5.Testing and Validation

Unit Testing:

1. Validation Rules

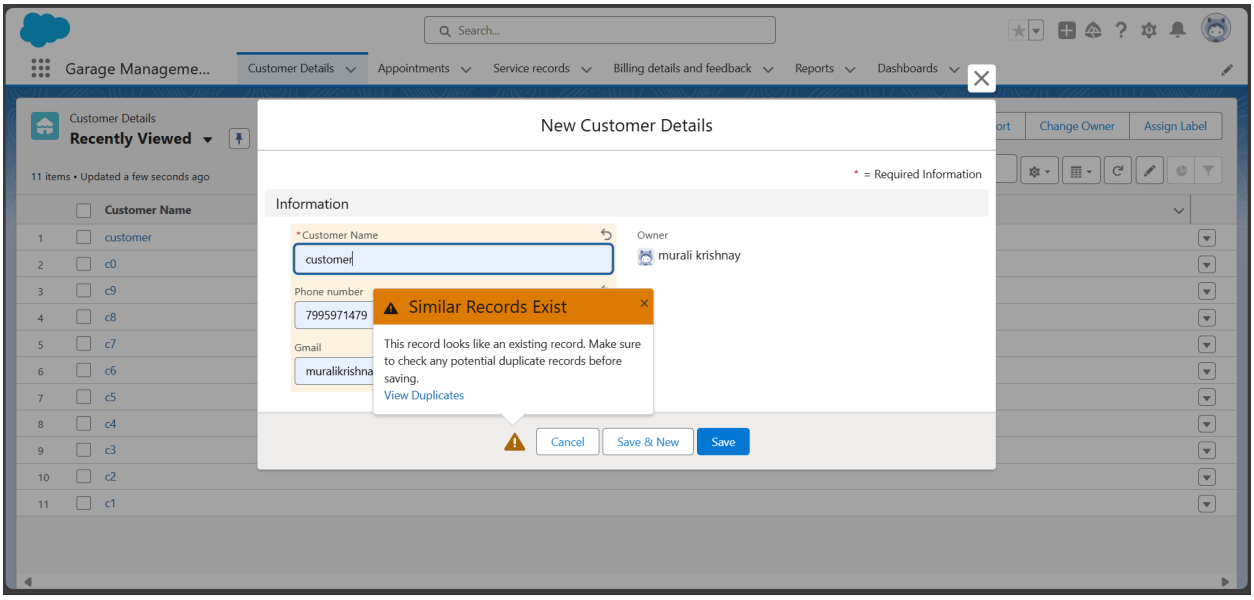
- **Purpose**: Ensure validation rules enforce data integrity and display proper error messages.
- **Steps**:
    a. Test scenarios where data violates the validation rule (e.g., invalid ratings in the **Billing Details and Feedback** object).
    b. Verify that the expected error message is displayed and prevents record saving.
    c. Test edge cases, such as boundary values.





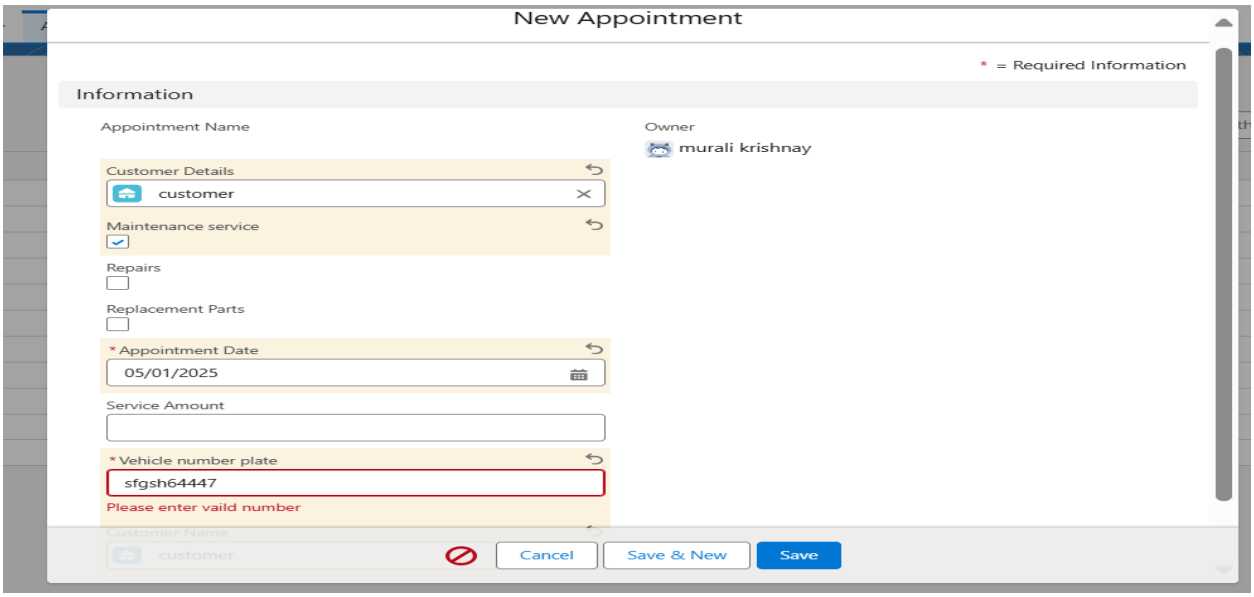
2. Validating Duplicate Rule for Customer:

The Duplicate Rule ensures data integrity by identifying and blocking duplicate records based on the defined criteria.



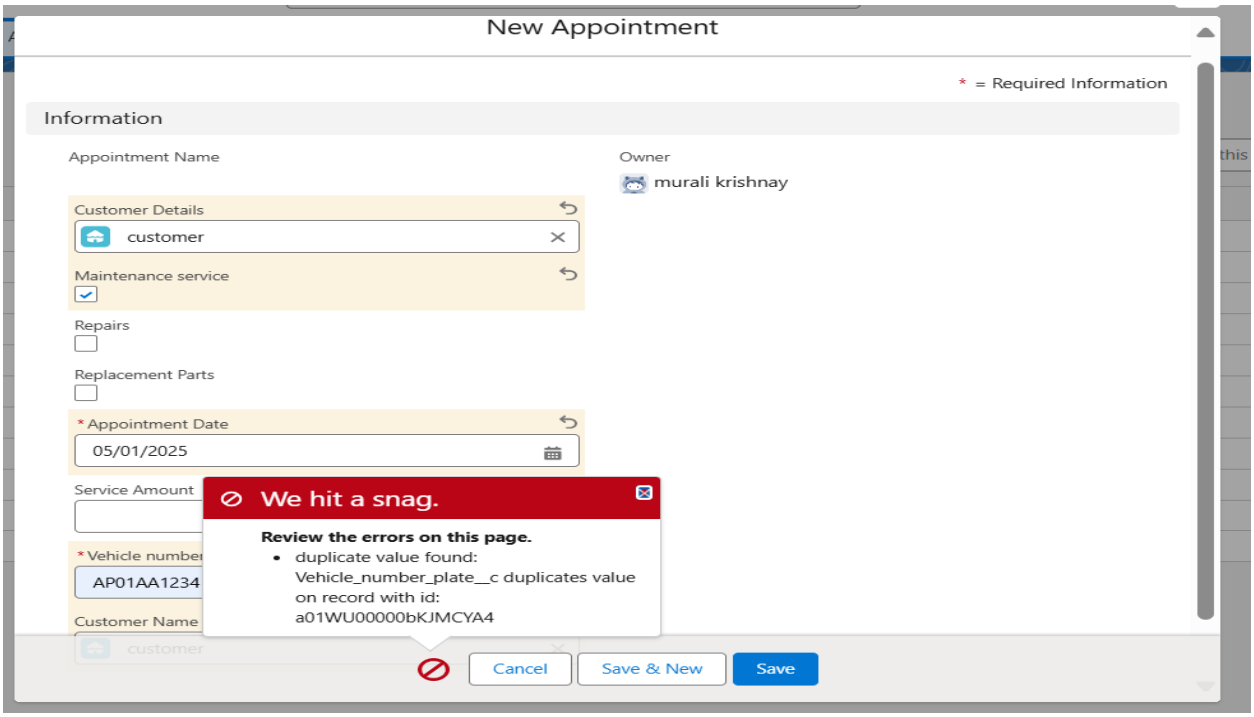
3. Validating Number Plate Number

The validation of a **License plate Number** ensures data integrity by enforcing specific formats or patterns during data entry. Here's how you can create and validate a validation rule for the **License plate Number** field.



Validating Duplicate Number Plate

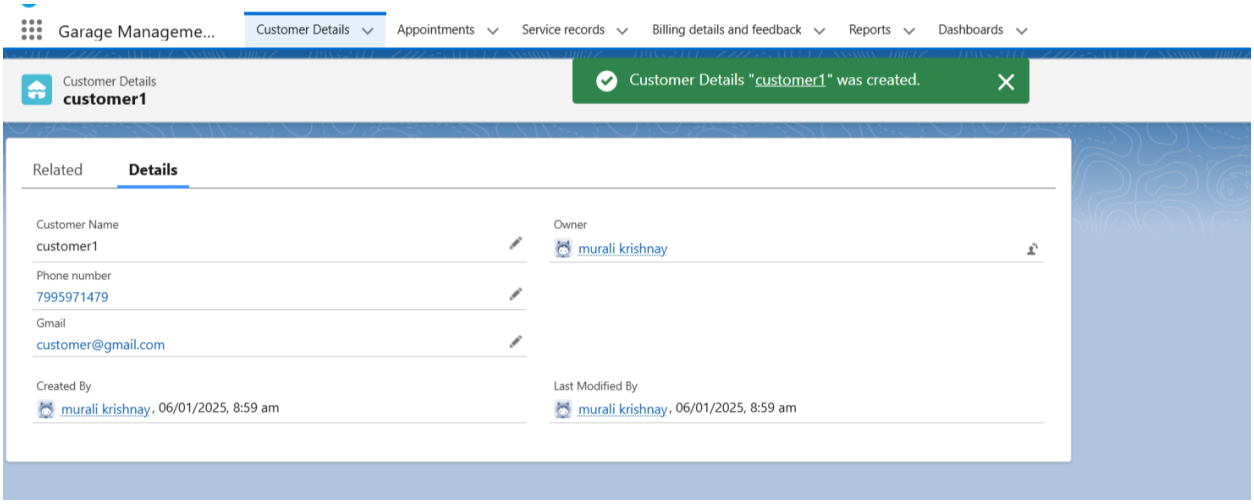
To prevent duplicate **License plate Numbers**, you can use a **Duplicate Rule** in Salesforce. This ensures that no two records can have the same value for the **License plate Number** field.

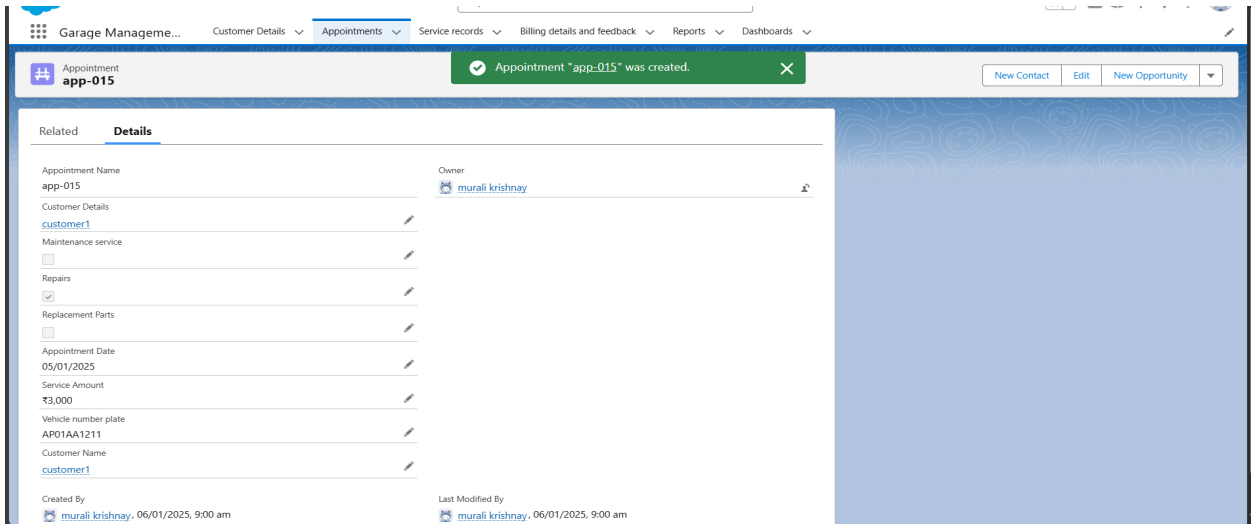


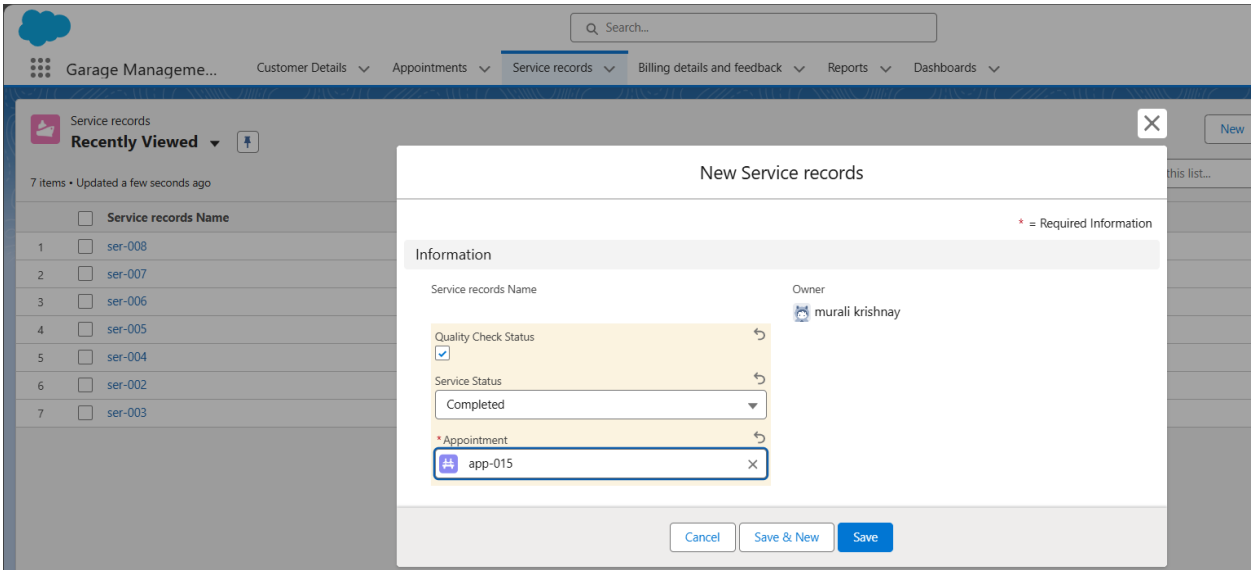
Validating Proper Creation of a Record

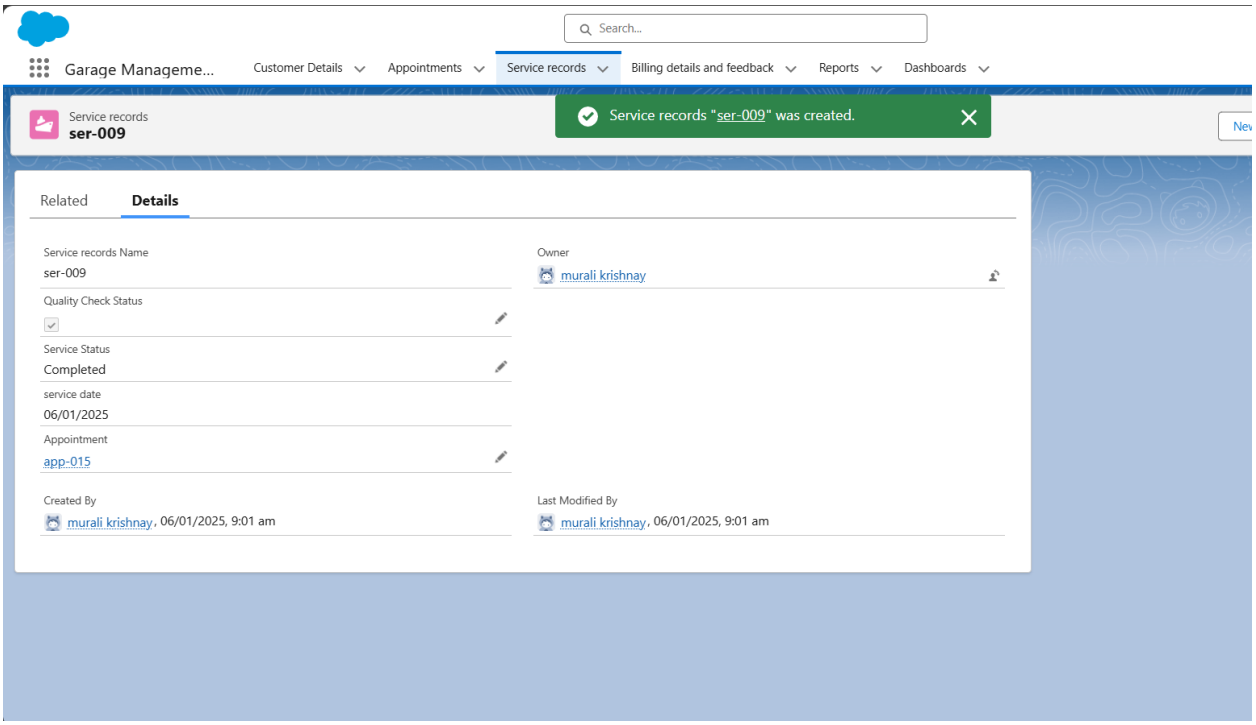
Validation ensures that records are created accurately and adhere to the business rules defined in your system. Here's how to validate the proper creation of records in

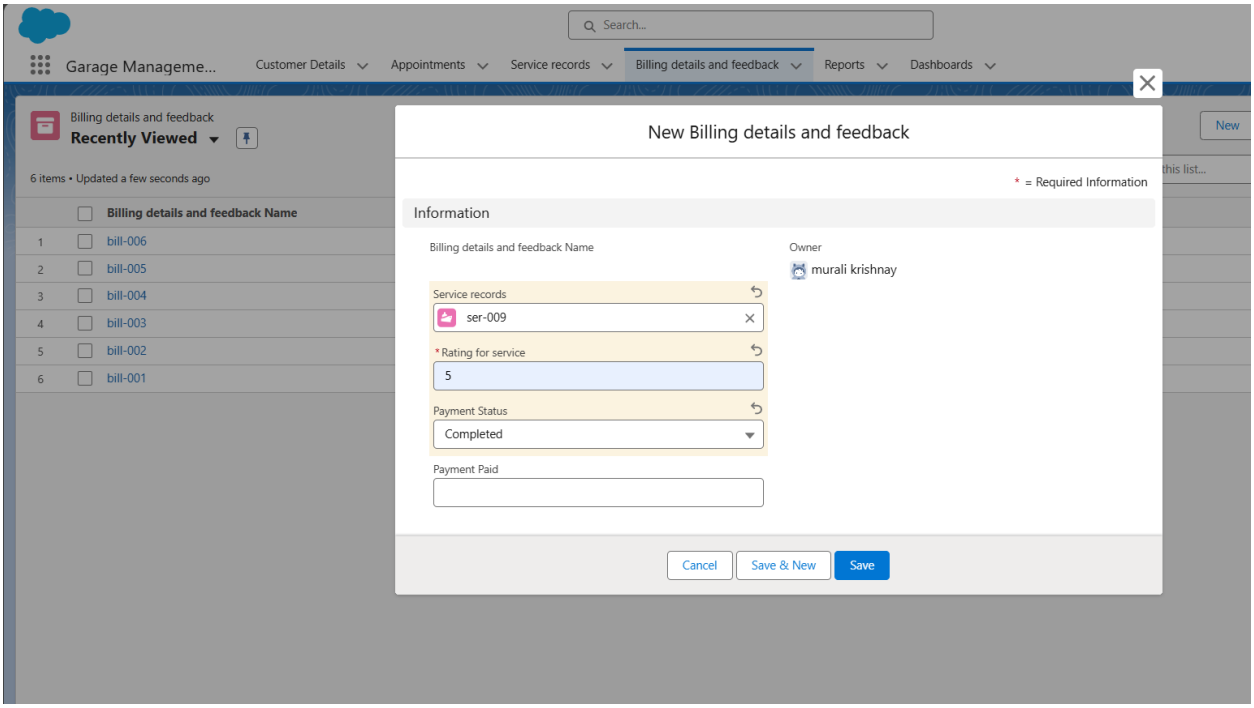
Salesforce

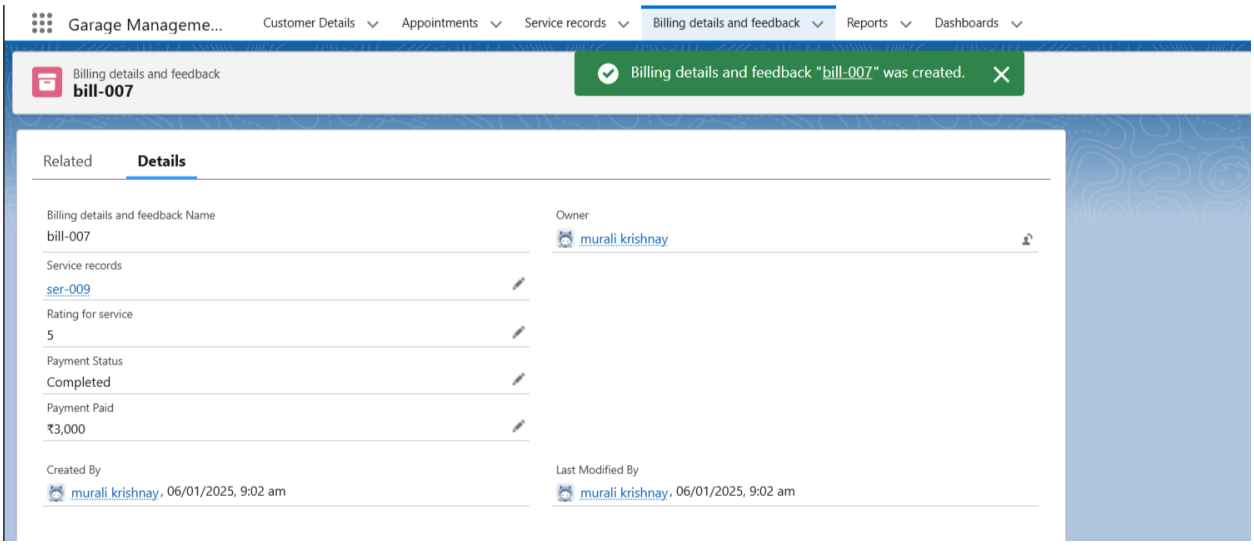

Garage Manageme...
Customer Details
Appointments
Service records
Billing details and feedback
Reports
Dashboards
Customer Details
customer1
Customer Details "customer1" was created.
Related
Details
Customer Name
customer1
Owner
murali krishnay
Phone number
7995971479
Gmail
customer@gmail.com
Created By
murali krishnay, 06/01/2025, 8:59 am
Last Modified By
murali krishnay, 06/01/2025, 8:59 am

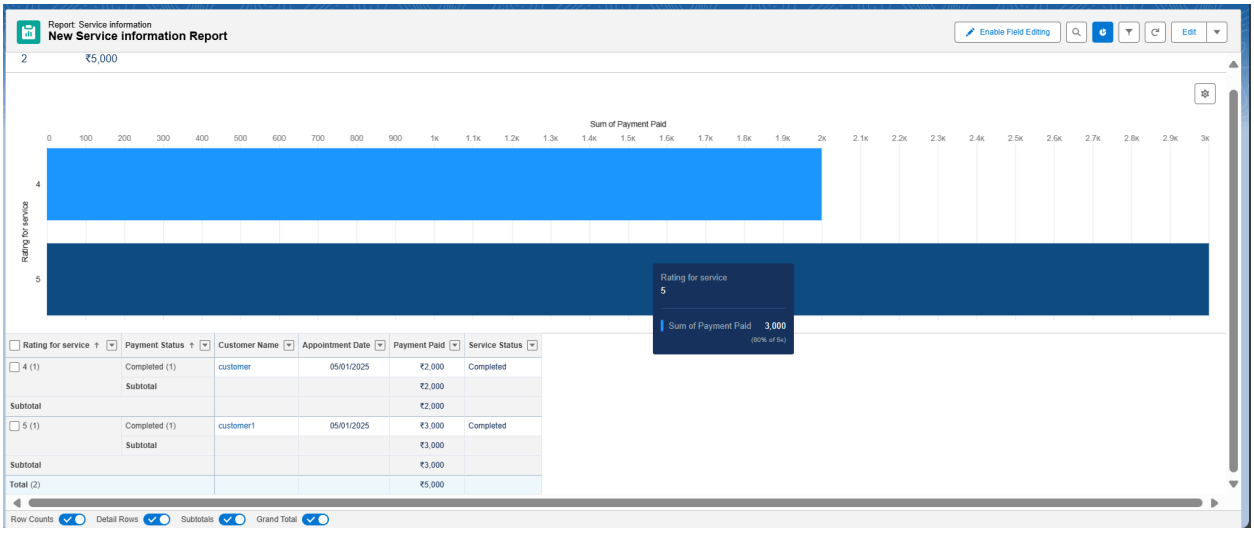

Garage Manageme...
Customer Details
Appointments
Service records
Billing details and feedback
Reports
Dashboards
Appointment
app-015
Appointment "app-015" was created.
New Contact
Edit
New Opportunity
Related
Details
Appointment Name
app-015
Owner
murali krishnay
Customer Details
customer1
Maintenance service
Repairs
Replacement Parts
Appointment Date
05/01/2025
Service Amount
₹3,000
Vehicle number plate
AP01AA1211
Customer Name
customer1
Created By
murali krishnay, 06/01/2025, 9:00 am
Last Modified By
murali krishnay, 06/01/2025, 9:00 am

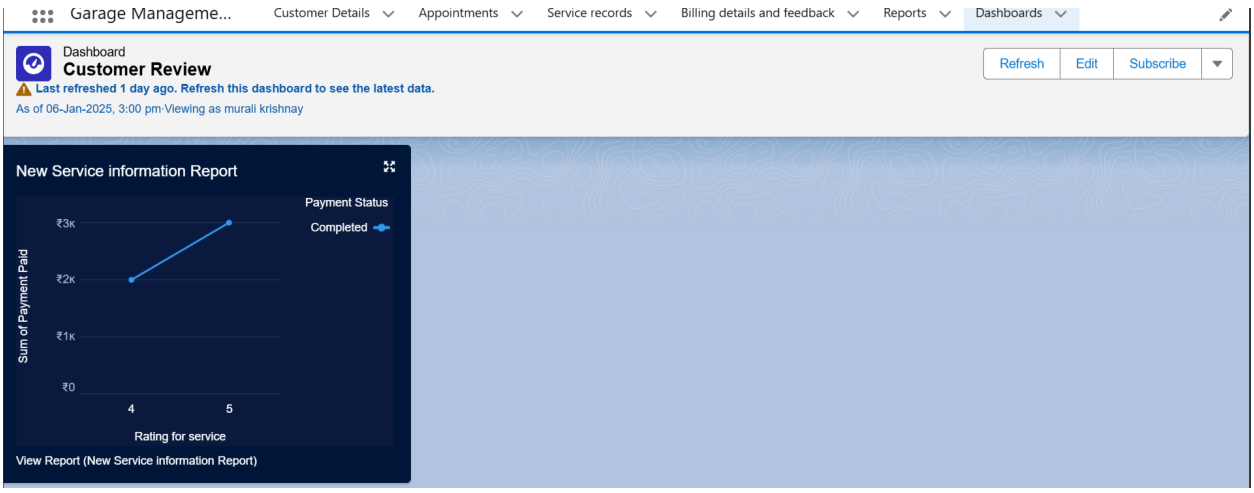

Search...
Garage Manageme...
Customer Details
Appointments
Service records
Billing details and feedback
Reports
Dashboards
Service records
Recently Viewed
7 items • Updated a few seconds ago
Service records Name
ser-008
ser-007
ser-006
ser-005
ser-004
ser-002
ser-003
New Service records
* = Required Information
Information
Service records Name
Owner
murali krishnay
Quality Check Status
Service Status
Completed
*Appointment
app-015
Cancel
Save & New
Save


Search...
Garage Manageme...
Customer Details
Appointments
Service records
Billing details and feedback
Reports
Dashboards
Service records
ser-009
Service records "ser-009" was created.
Related
Details
Service records Name
ser-009
Owner
murali krishnay
Quality Check Status
Service Status
Completed
service date
06/01/2025
Appointment
app-015
Created By
murali krishnay, 06/01/2025, 9:01 am
Last Modified By
murali krishnay, 06/01/2025, 9:01 am


Search...
Garage Manageme...
Customer Details
Appointments
Service records
Billing details and feedback
Reports
Dashboards
Billing details and feedback
Recently Viewed
6 items • Updated a few seconds ago
Billing details and feedback Name
bill-006
bill-005
bill-004
bill-003
bill-002
bill-001
New
New Billing details and feedback
* = Required Information
Information
Billing details and feedback Name
Owner
murali krishnay
Service records
ser-009
* Rating for service
5
Payment Status
Completed
Payment Paid
Cancel
Save & New
Save


Garage Manageme...
Customer Details
Appointments
Service records
Billing details and feedback
Reports
Dashboards
Billing details and feedback
bill-007
Billing details and feedback "bill-007" was created.
Related
Details
Billing details and feedback Name
bill-007
Owner
murali krishnay
Service records
ser-009
Rating for service
5
Payment Status
Completed
Payment Paid
₹3,000
Created By
murali krishnay, 06/01/2025, 9:02 am
Last Modified By
murali krishnay, 06/01/2025, 9:02 am


Report: Service information
New Service information Report
Enable Field Editing
Edit
2
₹5,000
Sum of Payment Paid
Rating for service
Rating for service
5
Sum of Payment Paid
3,000
Rating for service
Payment Status
Customer Name
Appointment Date
Payment Paid
Service Status
4 (1)
Completed (1)
customer
05/01/2025
₹2,000
Completed
Subtotal
₹2,000
Subtotal
₹2,000
5 (1)
Completed (1)
customer1
05/01/2025
₹3,000
Completed
Subtotal
₹3,000
Subtotal
₹3,000
Total (2)
₹5,000
Row Counts
Detail Rows
Subtotals
Grand Total


Garage Manageme...
Customer Details
Appointments
Service records
Billing details and feedback
Reports
Dashboards
Dashboard
Customer Review
Last refreshed 1 day ago. Refresh this dashboard to see the latest data.
As of 06-Jan-2025, 3:00 pm Viewing as murali krishnay
Refresh
Edit
Subscribe
New Service information Report
Payment Status
Completed
Sum of Payment Paid
₹3k
₹2k
₹1k
₹0
4
5
Rating for service
View Report (New Service information Report)

6.Conclusion

1. Summary of Achievements

1. **Streamlined Record Management**:
   Successfully implemented a system for managing customer details, billing information, and feedback. The robust use of validation and duplicate rules ensures data integrity and consistency.
2. **Enhanced Business Logic**:
   Developed and deployed Apex classes, triggers, and flows to automate critical business processes, such as:
   - Automatic service amount distribution based on selected customer services.
   - Real-time email alerts to customers upon payment completion.
3. **Improved Data Accuracy**:
   - Validation rules ensure fields like ratings and number plates adhere to specific formats and constraints.
   - Matching and duplicate rules prevent redundant entries for critical identifiers like email and phone numbers.
4. **User-Friendly Interface**:
   Designed an intuitive user interface for seamless interaction with Salesforce objects. This includes:
   - Proper layouts for billing details, feedback, and customer records.
   - Easy-to-navigate forms with built-in validation for error-free data entry.
5. **Testing and Validation**:
   Comprehensive testing conducted for:
   - Apex classes and triggers to ensure smooth execution of business logic.
   - UI components to confirm compliance with functional requirements.
   - Validation rules to maintain data quality across the system.
6. **Scalable Solution**:
   - Leveraged Salesforce features like matching rules, validation rules, flows, and Apex to build a scalable and efficient solution.
   - Ensured that the design accommodates future growth and additional requirements.

2. Key Benefits Delivered

- **Operational Efficiency**: Automated workflows reduce manual intervention and improve process accuracy.
- **Data Integrity**: Validation and duplicate rules ensured high-quality, reliable data.
- **Customer Satisfaction**: Real-time communication and accurate service tracking improved the overall customer experience.
- **Seamless Collaboration**: Role-based access and permissions allowed efficient collaboration among team members.

Future Scope

- Explore the integration of additional Salesforce features like Lightning Web Components for enhanced UI.
- Implement advanced analytics and dashboards for deeper business insights.
- Incorporate AI-based automation for predictive analytics and customer support.