Project Design Phase

Solution Architecture

Date	30October 2025
Team ID	NM2025TMID03420
Project Name	Garage Management System
Maximum Marks	4 Marks

Solution Architecture:

Goals of the Architecture:

- Provide an integrated digital system to automate garage operations such as service booking, technician assignment, and billing.
- Maintain data consistency and accuracy across customer, vehicle, job, and inventory modules.
- Improve efficiency by reducing manual record-keeping and paper-based workflows.
- Ensure scalability, data security, and easy integration with third-party systems (e.g., payment gateways, SMS/Email APIs).
- Enhance customer satisfaction through transparency and real-time communication.

Key Components:

- **Customer Table:** Stores customer information, contact details, and linked vehicle records.
- **Vehicle Table:** Contains vehicle details, service history, and current job status.
- **Service Job Table:** Manages service bookings, job cards, and technician assignments.
- **Inventory Table:** Tracks spare parts availability, usage, and reorder levels.
- **Invoice Table:** Maintains service charges, taxes, and payment transactions.

- **Notification Logic:** Sends booking confirmations, job updates, and invoice notifications automatically.
- **Role-Based Access Control:** Defines permissions for admin, technician, and customer users.

Development Phases:

1. Design the database schema for customers, vehicles, jobs, and inventory.
2. Develop service booking and job creation modules with technician assignment.
3. Implement parts tracking and inventory management functionality.
4. Integrate invoicing, tax calculations, and payment options.
5. Configure notification services for booking confirmations and completion alerts.
6. Conduct testing with multiple user roles (admin, technician, customer).
7. Deploy the application on Salesforce or a cloud environment and perform pilot testing.

Solution Architecture Description:

The **Garage Management System** follows a **multi-tier architecture** consisting of a presentation layer, business logic layer, and data layer. The **presentation layer** provides user interfaces for administrators, technicians, and customers, built using Salesforce Lightning Web Components or a modern web framework. The **business logic layer** manages operations such as service booking, job assignment, inventory updates, and invoice generation through Apex or Node.js APIs. The **data layer** stores structured records of customers, vehicles, and transactions using Salesforce objects or a relational database. An **integration layer** connects the system to payment gateways, notification APIs, and reporting tools. This architecture ensures modularity, security, and scalability, supporting multiple garages and providing a seamless experience for both staff and customers.

Example-Solution Architecture Diagram:

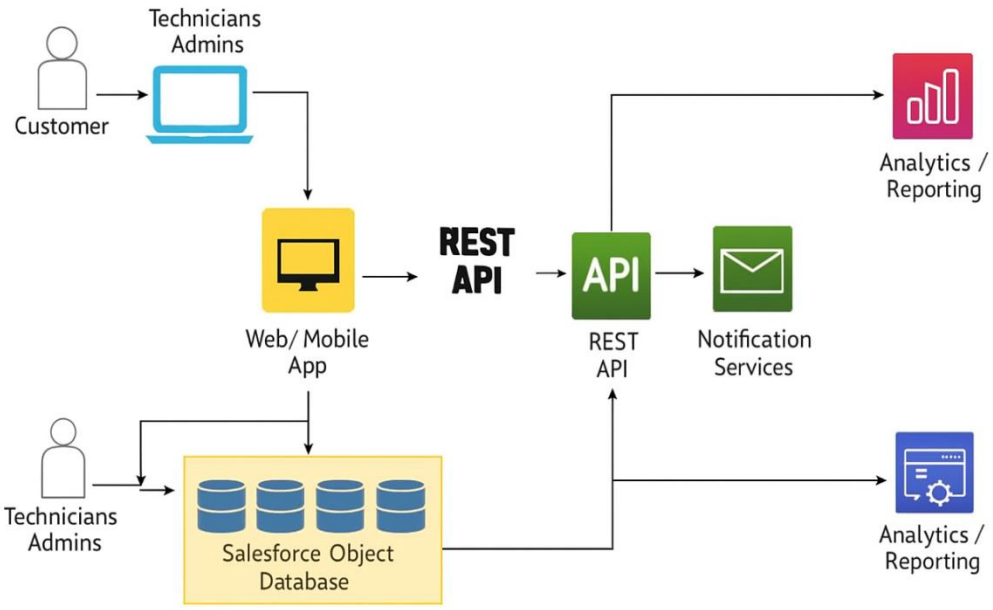

Figure 1: Architecture and data flow of the Garage Management System

Reference:

1. https://aws.amazon.com/architecture/garage-management-system-on-aws/
2. https://www.salesforceben.com/garage-management-system-using-salesforce-platform/
3. https://developer.salesforce.com/blogs/garage-system-architecture
4. https://www.researchgate.net/publication/garage_management_system_architecture_design
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