Project Design Phase

Solution Architecture

Date	07-11-2025
Team ID	NM2025TMID05731
Project Name	Garage Management System

1. Introduction

The Solution Architecture for the Garage Management System (GMS) defines how different system components interact, ensuring smooth operations across all modules such as vehicle servicing, customer management, inventory, and billing. This architecture focuses on scalability, reliability, and security, providing a seamless experience for both customers and garage staff.

2. System Layers and Architecture Design

Layer Name	Description	Technologies / Tools
Presentation Layer (User Interface)	The front-end interface where users (admin, mechanic, customer) interact with the system.	HTML, CSS, JavaScript, React/Streamlit
Application Layer (Business Logic)	Contains the main logic that processes user requests, manages workflows, and enforces business rules.	Python, Flask/Django
Database Layer (Data Storage)	Stores all structured data like customer info, vehicle details, service history, and billing records.	MySQL, PostgreSQ

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Garage Management System

Presentation Layer
(User Interface)

Application Layer
(Business Logic)

Database Layer
(Data Storage)

Integration Layer
(External Interfaces)

Security Layer
(Authentication & Accesss Control)

End

3. Key Components in Solution Architecture

1. User Management Module – Handles registration, login, and access control.
2. Service Management Module – Tracks ongoing vehicle repairs, updates status, and assigns mechanics.
3. Inventory Management Module – Manages spare parts availability and purchase orders.
4. Billing and Payment Module – Automates invoices and integrates with online payment systems.
5. Reporting and Analytics Module – Generates service and financial reports for admin review.

4. Data Flow Summary

- Users send requests through the UI (Presentation Layer).
- Requests are processed in the Business Logic Layer.
- Data is retrieved or stored in the Database Layer.
- External systems like payment gateways or email services connect via the Integration Layer.
- Access and security are controlled by the Security Layer.

5. Conclusion

The Solution Architecture of the Garage Management System ensures all operational modules are connected in a structured and efficient manner. It supports modular development, allowing future upgrades such as AI-based maintenance prediction or IoT-based vehicle tracking.
This layered architecture creates a robust, secure, and user-friendly system, making garage operations more transparent and efficient.