Project Title: Garage Management System

Date: November 01, 2025

Team ID: NM2025TMID04233

Maximum Marks: 2 Marks

Phase 3: Project Design Phase - Proposed Solution

Proposed Solution Template

S.No	Parameter	Description
1.	**Problem Statement** (Problem to be solved)	Automobile service centers and garages often face operational inefficiencies such as difficulty in tracking ongoing repairs, managing spare parts inventory, maintaining service records, handling multiple customer requests, and ensuring timely maintenance schedules. The lack of integrated systems for inventory, job tracking, billing, and customer communication results in reduced productivity, service delays, and customer dissatisfaction.
2.	**Idea/Solution Description**	A comprehensive Garage Management System that streamlines workshop operations by integrating real-time job tracking, spare parts inventory management, customer record management, billing automation, and performance analytics. The system supports digital job cards, inventory alerts, supplier management, automated invoicing, and mobile access for technicians and managers.
3.	**Novelty / Uniqueness**	Unlike generic management systems, this platform is tailored for garages and service centers. It manages vehicle service history, spare parts usage, technician assignments, and predictive maintenance schedules. The system integrates diagnostic tools, supports barcode/QR-based inventory tracking, and provides real-time analytics on service efficiency, customer satisfaction, and resource utilization.
4.	**Social Impact / Customer Satisfaction**	The solution improves customer experience by ensuring faster service turnaround, transparent billing, and digital service records. It helps garage owners reduce idle time, minimize spare parts wastage, and optimize technician productivity. Customers benefit from real-time service updates, accurate estimates, and quality assurance.
5.	**Business Model (Revenue Model) / Sustainability**	The system is offered as a subscription-based platform for garages and service centers of various sizes. Revenue sources include tiered subscriptions, setup and customization services, maintenance contracts, and integration with accounting or CRM software. The platform reduces operational costs through automation, optimized inventory, and improved scheduling efficiency.
6.	**Scalability of the Solution**	The Garage Management System can scale from small local workshops to multi-location service chains. It supports integration with supplier networks, spare parts distributors, customer mobile apps, and payment gateways. Future expansions include predictive maintenance using IoT sensors, vehicle tracking integration, and AI-driven repair recommendations.

Solution Description

System Architecture

The Garage Management System connects all core service operations into a unified platform:

1. Job Tracking & Management: Tracks vehicles under service with job cards including vehicle details, assigned technician, service type, and status.
2. Spare Parts Inventory: Monitors stock levels, triggers reorder alerts, and logs parts used per service.
3. Automated Billing: Generates invoices based on labor and parts, applies taxes and discounts, and supports digital payments.
4. Customer & Vehicle Records: Stores customer details, service history, reminders for periodic maintenance, and feedback tracking.
5. Supplier Management: Manages parts vendors, purchase orders, and delivery performance.
6. Reporting & Analytics: Dashboards showing daily jobs, revenue, expenses, and technician performance.

Implementation Approach

Phase 1: Design database for vehicles, customers, inventory, and job cards.
Phase 2: Develop modules for job tracking, billing, and spare parts management.
Phase 3: Implement role-based dashboards and automated alerts for reorders and due services.
Phase 4: Integrate supplier management and digital invoicing.
Phase 5: Develop analytics and reporting modules.
Phase 6: Conduct pilot testing in one workshop, gather feedback, and scale deployment.

Benefits by Stakeholder

Stakeholder	Benefit
Garage Technicians	Simplified job tracking, easy access to service history, and automated task updates. Workshop Managers: Real-time visibility of jobs, inventory control, and performance insights.
Suppliers	Streamlined purchase orders and demand forecasting.
Customers	Transparent communication, digital invoices, and timely service reminders.
Owners	Reduced operational costs, better profitability, and customer retention.

Conclusion

The proposed Garage Management System provides an integrated platform that simplifies workshop operations, enhances transparency, and boosts productivity. By automating job tracking, inventory control, billing, and communication, it delivers measurable benefits in efficiency, customer satisfaction, and profitability. Its scalable design ensures suitability for both small garages and large service networks.