Phase 4: Requirement Analysis Phase

Project Title: Garage Management System

Introduction

Requirement analysis is an important phase that identifies what the system needs to do and how it should perform. It ensures a clear understanding of user needs and translates them into technical and functional requirements. For the Garage Management System, this phase helps define and organize all business processes — such as managing vehicles, customers, repairs, and billing — before the system is implemented

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Purpose of Requirement Analysis

The main purpose of this phase is to gather all necessary requirements for developing an efficient garage management solution. By understanding what garage owners, mechanics, and customers need, the system can be designed to streamline daily operations, track vehicle services, manage inventory, and generate reports that improve overall performance and customer satisfaction.

Methods of Requirement Gathering

To identify the project requirements, the following methods were used:

- **Observation:** Studying how garages currently handle customer records, vehicle details, and service management.
- **Interview/Discussion:** Collecting feedback from garage owners and mechanics about common challenges.
- **Analysis of Existing Systems:** Reviewing existing garage management software and identifying missing or inefficient features.
- **Brainstorming:** Discussing and listing the functions that could enhance service quality and reduce manual work.

Functional Requirements

functional requirements define what the system must do. The main functional requirements of the Garage Management System include:

1. **Customer Management:**
    - Add, view, edit, and delete customer details.
    - Store customer name, contact number, address, and email.
2. **Vehicle Management:**
    - Record vehicle details such as registration number, model, brand, and owner.
    - Track service history for each vehicle.
3. **Service and Repair Management:**
    - Create service requests and assign them to mechanics.
    - Record repair details, service charges, and delivery status.
4. **Inventory Management:**
    - Maintain spare parts stock with item name, quantity, and cost.
    - Update inventory automatically when parts are used or restocked.
5. **Billing and Payment:**
    - Generate service invoices automatically based on completed jobs.
    - Support multiple payment modes (cash, card, or online).
6. **Reports and Dashboard:**
    - Generate reports on daily income, pending services, and part usage.
    - Display dashboard insights such as total customers, active jobs, and monthly revenue.
7. **Notifications and Alerts:**
    - Send reminders to customers for vehicle maintenance.
    - Notify admin when spare parts are running low.

Non-Functional Requirements

Non-functional requirements define how the system should perform rather than what it does.

1. **Performance:**
    - The system should respond quickly and process customer or vehicle data efficiently.
    - Dashboards and reports should load within seconds.
2. **Security:**

    - Customer and payment data should be protected through user authentication.
    - Only authorized users (e.g., admin, mechanic) should access specific modules.
3. **Reliability:**
    - The system should operate without data loss or unexpected crashes.
    - Regular data backups must be maintained.
4. **Usability:**
    - The interface should be user-friendly for staff with basic computer knowledge.
    - Major operations (adding, updating, billing) should be done in minimal steps.
5. **Scalability:**
    - The system should support an increasing number of customers and vehicles as the garage grows.
6. **Maintainability:**
    - The system should allow easy updates and feature additions in the future.

System Requirements

Hardware Requirements:

- Computer or laptop with at least 4 GB RAM.
- Stable internet connection.
- Browser support (Google Chrome, Microsoft Edge).

Software Requirements:

- Salesforce Developer Edition account.
- SmartInternz platform access.
- GitHub account for documentation.
- Word or PDF software for preparing reports.

Requirement Validation

Before starting implementation, all requirements were reviewed to ensure they meet the business goals and are feasible for development. The validation confirmed that the system features are:

- Technically possible to implement
- Useful for garage operations
- Achievable within the project timeline.

Conclusion

The Requirement Analysis Phase provides a clear understanding of both functional and non-functional needs of the Garage Management System. By defining modules like customer, vehicle, service, and billing management in detail, this phase lays the foundation for developing an efficient, reliable, and user-friendly system that simplifies garage operations and enhances customer satisfaction.