Phase 4: Requirement Analysis Phase

Project Title: Garage Management System

Introduction

Requirement analysis constitutes a pivotal phase that establishes precisely what the system must accomplish and its expected performance standards. It is instrumental in achieving a clear grasp of user demands and translating these into specific technical and functional specifications. For the Garage Management System, this stage is crucial for defining and structuring all business procedures, such as coordinating vehicles, managing clientele, tracking maintenance, and handling financial transactions.

Purpose of Requirement Analysis

The fundamental objective of this phase is to collect all necessary prerequisites for building an effective garage management solution. By comprehending the needs of workshop owners, technicians, and customers, the system can be tailored to optimize day-to-day workflow, monitor vehicle maintenance records, control parts inventory, and generate reports that lead to improved overall efficiency and client approval.

Methods of Requirement Gathering

To accurately identify the project requirements, the following approaches were employed:

- **Observation:** Involves examining the current methods used by garages for handling client records, vehicle specifications, and service coordination.
- **Interview/Discussion:** Gathering input from garage owners and mechanics regarding their persistent operational difficulties.
- **Analysis of Existing Systems:** Reviewing currently available garage management software to pinpoint any deficient or underdeveloped features.
- **Brainstorming:** Collaborative discussion to list potential functionalities that could elevate service quality and minimize manual labor.

Functional Requirements

Functional requirements specifically delineate the mandatory actions of the system. The essential functional requirements for the Garage Management System encompass:

1. **Customer Management:**
    - Ability to input, view, modify, and delete customer details.
    - System must store customer name, contact number, physical address, and email.
2. **Vehicle Management:**
    - Recording vehicle specifics, including license plate number, model, brand, and owner details.
    - Tracking comprehensive service history for every vehicle.
3. **Service and Repair Management:**
    - Capability to initiate service requests and delegate them to appropriate mechanics.
    - Recording of repair specifics, service costs, and vehicle delivery status.
4. **Inventory Management:**
    - Maintaining records of spare parts stock, including item name, current quantity, and cost.
    - Automating the inventory update process when parts are used or replenished.
5. **Billing and Payment:**
    - Automatic generation of service invoices based on completed work orders.
    - Provision to support multiple methods of payment (e.g., cash, card, or digital transactions).
6. **Reports and Dashboard:**

- Generation of reports covering metrics like daily revenue, services pending, and parts consumption.
- Displaying dashboard statistics such as total clients, active repair jobs, and monthly financial performance.

7. **Notifications and Alerts:**
    - Sending maintenance reminders to customers for their vehicles.
    - Alerting the administrator when spare parts stock levels become critically low.

Non-Functional Requirements

Non-functional requirements describe the qualitative aspects of how the system must operate, rather than *what* it does.

1. **Performance:**
    - The system must exhibit rapid response times and efficiently handle customer or vehicle data processing.
    - Dashboards and reports should be able to load within a few seconds.
2. **Security:**
    - Client and payment information must be secured through strong user authentication mechanisms.
    - Access to specific modules should be restricted to authorized personnel only (e.g., administrators, technicians).
3. **Reliability:**
    - The system must function without experiencing data loss or unexpected failures.
    - Consistent data backups must be performed and maintained.
4. **Usability:**
    - The interface should be straightforward for staff possessing only basic computer literacy.

- Key operations (creation, modification, billing) must be achievable in a minimum number of steps.

5. **Scalability:**
    - The platform needs to accommodate an increasing volume of customers and vehicles as the business expands.
6. **Maintainability:**
    - The system should permit easy future updates and the simple addition of new features.

System Requirements

Hardware Requirements:

- A personal computer or laptop with a minimum of 4 GB of RAM.
- A reliable and continuous internet connection.
- Compatibility with major browsers (e.g., Google Chrome, Microsoft Edge).

Software Requirements:

- Access to a Salesforce Developer Edition account.
- Access to the SmartInternz platform.
- A GitHub account for storing project documentation.
- Word processing or PDF software for report preparation.

Requirement Validation

Prior to commencing the implementation phase, all gathered requirements were thoroughly reviewed to confirm they align with the business goals and are technically feasible for development. This validation process confirmed that the system features are:

- Technically achievable.
- Beneficial for garage operations.
- Deliverable within the defined project schedule.

Conclusion

The Requirement Analysis Phase furnishes a clear and detailed understanding of both the functional and non-functional needs of the Garage Management System. By meticulously defining modules such as customer, vehicle, service, and billing management, this stage establishes the necessary framework for developing a system that is efficient, dependable, and user-friendly, thereby simplifying workshop operations and boosting client satisfaction.