

Phase 5: Performance Testing Phase

Project Title: Garage Management System

Introduction

Performance testing is the final and most important stage of the project. It ensures that the system works efficiently under various conditions and remains stable after deployment. In this phase, the Garage Management System was tested to verify its speed, reliability, and stability. The main focus of testing was to check response time, accuracy of operations, and smooth functioning of modules like Customer, Vehicle, Service, Billing, and Inventory.

Objective of Testing

The main objective of the performance testing phase is to ensure that the Garage Management System performs all operations correctly without any delay or error. It checks whether the system can handle customer data, service requests, billing records, and inventory efficiently. It also ensures that the system supports multiple users and transactions simultaneously, maintaining smooth garage operations.

Functional Testing

Functional testing was conducted to verify that every feature of the system performs as intended. Customer registration, vehicle details entry, service scheduling, and billing were tested thoroughly. The system allowed adding, updating, and deleting records without error. Service details like type, date, and cost were correctly linked to customer and vehicle data. Billing and payment modules generated accurate invoices. The test confirmed that all designed functions worked as expected.

Performance Testing

The performance of the system was tested to check how efficiently it handles multiple records and users. Several customer, vehicle, and service records were entered to measure speed and stability. Reports and dashboards loaded quickly without lag. Notifications for completed services and pending payments were generated instantly.

The system performed well even with a high volume of data, showing its ability to manage daily garage operations effectively.

Usability Testing

Usability testing ensured that the application is user-friendly and easy to navigate. Pages like Customer, Vehicle, and Service were checked for clarity and accessibility. Labels and buttons were properly named for better understanding. Mechanics and staff were able to use the system easily without technical help. The dashboard was designed to display key performance indicators clearly, helping staff monitor operations efficiently.

Security Testing

Security testing was conducted to ensure the safety of customer and service data. User roles and permissions were verified to confirm that only authorized users could access or modify data. Password protection and secure login methods were implemented. All data was stored safely in the system's database, ensuring privacy and protection against unauthorized access. The results confirmed that the application is secure and trustworthy.

Integration Testing

Integration testing verified that all modules of the Garage Management System work together properly. When a service request was created, it automatically linked to the corresponding customer and vehicle details. After billing, inventory and payment records were updated instantly. This confirmed smooth communication between modules such as Customer, Vehicle, Service, Billing, and Inventory.

Test Environment

Testing was performed on a Windows 10 operating system using the Chrome browser and a local database. The environment simulated real garage conditions where multiple users access the system simultaneously. This setup helped ensure the system's readiness for real-time garage use.

Test Results and Fixes

All test cases were executed successfully. The system passed functional, performance, usability, security, and integration testing. A few small issues like incorrect field alignment and slow dashboard loading were found. These were fixed by optimizing database queries and improving page layout. After fixes, the system worked efficiently without errors or delays

Conclusion

The Performance Testing Phase successfully verified that the Garage Management System is efficient, reliable, and user-friendly. All major modules such as Customer, Vehicle, Service, Billing, and Inventory worked together smoothly without any issues. The system handled multiple records and user operations effectively under real-time conditions, maintaining fast response times and stable performance even with large data volumes. All functions executed accurately, ensuring error-free service and billing processes. Security testing confirmed that customer and transaction data remain fully protected from unauthorized access. The interface was found to be simple and easy to use, allowing staff to navigate the system effortlessly. Integration testing showed seamless communication among all components, ensuring smooth workflow throughout the application. Minor issues detected during testing were resolved promptly to enhance stability and efficiency. Overall, the system met all performance and security standards. Hence, the Garage Management System is ready for real-time implementation, marking the successful completion of the project.