

Phase 5: Performance Testing Phase

Project Title: Garage Management System

Introduction

Performance testing is recognized as the conclusive and most critical stage of the project. This step validates that the system operates effectively under various conditions and maintains stability following its deployment. During this phase, the Garage Management System underwent rigorous testing to confirm its speed, reliability, and stable operation. The primary testing focus was on assessing response time, operational accuracy, and the seamless functionality of key modules like Client, Vehicle, Service, Invoicing, and Stock.

Objective of Testing

The paramount objective of the performance testing phase is to ensure the Garage Management System executes all tasks accurately without any delays or errors. It specifically verifies the system's capability to efficiently manage client data, service requests, billing records, and inventory. Furthermore, it confirms the system can support simultaneous access by multiple users and transactions, thereby sustaining smooth workshop operations.

Functional Testing

Functional testing was conducted to verify that every capability of the system performed precisely as intended. This involved thorough testing of client registration, vehicle data entry, service scheduling, and financial billing. The system successfully allowed the addition, modification, and removal of records without error. Service-related data, such as type, date, and cost, was correctly cross-referenced with client and vehicle information. The billing and payment features produced precise invoices. The tests confirmed that all planned functions operated according to specifications.

Performance Testing

The system's performance was evaluated to determine its efficiency in handling a large number of records and users. Numerous records for customers, vehicles, and

services were entered to measure its speed and stability. Reports and dashboards were observed to load rapidly without any noticeable slowdown. Notifications regarding finished services and outstanding payments were generated instantaneously. The system maintained good performance even with a high data volume, demonstrating its capacity to effectively manage daily workshop activities.

Usability Testing

Usability testing was carried out to ensure the application is intuitive and simple to navigate. Screens for Client, Vehicle, and Service management were checked for clarity and ease of access. Labels and buttons were appropriately named for better comprehension. Technicians and general staff could utilize the system easily without requiring technical support. The dashboard was designed to clearly present key performance indicators, assisting staff in monitoring operations efficiently.

Security Testing

Security testing was executed to guarantee the protection of client and service-related data. User roles and permission settings were checked to ensure only authorized individuals could view or modify specific data. Password protection and secure log-in procedures were properly implemented. All data was securely stored within the system's database, ensuring privacy and protection against any unauthorized access. The findings verified that the application is secure and reliable.

Integration Testing

Integration testing confirmed that all components of the Garage Management System communicate and function together seamlessly. For instance, when a service request was created, it automatically established a link to the relevant client and vehicle data. Following the billing process, inventory and payment logs were updated instantly. This confirmed seamless data exchange among modules like Client, Vehicle, Service, Billing, and Inventory.

Test Environment

Testing procedures were carried out on a Windows 10 operating system, utilizing the Chrome web browser and a local database. This environment was set up to simulate actual workshop conditions, where multiple personnel access the system concurrently.

This configuration helped confirm the system's readiness for live, real-time use in a garage setting

Test Results and Fixes

All test scenarios were executed successfully. The system passed functional, performance, usability, security, and integration testing. A few minor issues were identified, such as slight inaccuracies in field alignment and slower dashboard loading times. These problems were promptly corrected by refining the database queries and enhancing the page layout. After these adjustments, the system operated effectively without errors or speed reduction.

Conclusion

The Performance Testing Phase successfully validated that the Garage Management System is highly efficient, reliable, and user-friendly. All core components, including Client, Vehicle, Service, Billing, and Inventory, functioned together smoothly without any complications. The system handled numerous records and user operations effectively under live conditions, maintaining quick response times and stable performance, even with extensive data. All functionalities executed with precision, guaranteeing error-free service and invoicing processes. Security checks confirmed that client and financial data remain completely safeguarded from unauthorized access. The interface was found to be simple and easy to operate, allowing staff to navigate the system effortlessly. Integration testing demonstrated seamless communication across all components, ensuring a smooth workflow throughout the application. Minor issues discovered during testing were immediately addressed to boost stability and efficiency. Overall, the system satisfied all established performance and security criteria. Consequently, the Garage Management System is prepared for real-time implementation, marking the successful completion of the project.