

RETAIL PLM APPLICATION TESTING IN RETAIL DOMAIN



Abstract

Retail PLM application is an intuitive, web-based solution ideal for footwear, apparel, and consumer products. While every attempt is made to focus on testing, we know that testing does not stand alone. It is dependent on development, drawing heavily on development practices. However, this being a separate process, its merits are usually assessed by users. This paper discusses best practices for testing processes in retail application validation.

Practice followed earlier in RFA Testing service – PLM domain

Testing, the most critical stage in the software development life cycle, adds value to a project. Earlier, as part of the software development and testing processes, deliverables such as requirements, test plan, test cases and results were maintained. Test suites were created and executed for customization and integration, which determined the effectiveness and efficiency of the testing & QA processes. Configurations and security metrics for different test suites were maintained separately. Defects were tracked and managed using the Bugzilla tool. Test suites were reviewed by the solution architect and test manager, while the test plan/test results were reviewed and approved by the test manager.



Retail Application Testing

- Documents – Functional Specification and Use Case Scenarios
- Test Planning
- Data Model Testing and Best Practices
- Security Matrix Testing and Best Practices
- Functional testing and Best Practices

Documents – Functional Specification and Use Case Scenarios

Functional specifications and use case scenarios make key inputs during development and functional testing. Software testing ensures that the product meets client requirements. It defines the external view of an application and use case procedure, indicating the options by which a service can be invoked. Testers use this to write down test cases from a black box testing perspective.

Customers provide feedback regarding functional specifications, following which test suites are generated while developing the code. Since both these activities are carried out simultaneously, there are no bottlenecks in the process. By the time the software code is ready, the test cases are also ready to be run against the code. This also ensures that both designers and architects have more clarity while developing the software. Moreover, documenting functional specifications helps track the matrix for changed requirements, if any.

Test Planning

In smaller projects, requirements management depends more upon what ought to be developed than on what is documented. Therefore, requirements management and its translation into test plans is crucial. The test plan contains the overall framework for evaluating the quality of test activities and objects and managing them successfully. It serves as a means of communication between the project team and the stakeholders and ensures proper estimation and metric-based test planning.

Data Model Testing

Usually, the first step in PLM retail testing is configuration testing. Most projects focus on only specific functional areas to address particular problems or achieve certain objectives. In practice, however, it is important to understand the impact of the configuration of an attribute on the overall functionality of a module. After configuring all the modules, they are tested through URLs on all properties of the attributes for each module in the application. To avoid risks while customization, they are tested at all levels. Client requests are considered while documenting and corrective action is taken, if required. Configuration uniformity is maintained across all servers.

Security Matrix Testing (ACL)

Security matrix testing is done to determine if the information stored on a software system is protected and accessible for intended use. Scripts are maintained for security matrix on different levels of a module. Access rights are defined and evaluated on group and attribute levels. The functionality of individual modules with different hierarchies is evaluated based on the access defined to each user group level. Execution is carried out based on CRUD permission provided to group and attribute levels. Various testing schemes can be adopted by QA & test engineers. Security testing protects software systems across the network from threats.

Functional Testing

Functional testing examines the way applications execute the required functions, assessing the quality of the released software. Test leads analyze client requirements and contribute to the overall design and development of the test suite intended to address specific needs. The functionality of individual modules is tested to ensure conformity with required specifications and seamless operation. Lastly, they are checked to see if the applications are working as per client requirements and delivering desired results.

Defect fixing includes conducting two types of tests on the fixed code: confirmation test to verify the fix and a regression test to ensure that the

application of the fix hasn't affected any existing function. The same principle applies when adding a new feature or functionality to the application. A regression test pack, thus, covers the basic workflow of a typical requirement/use case. Test results are shared with the client, and reviewed and approved by the testing manager. Testers design test scripts/cases with limited guidance, execute the test suite, and share results with the team. The Test Link management tool acts as a repository for all updated documents. Execution is carried out on QA environments (replica of production environments).



Challenges Faced in Previous Testing Processes:

- ✓ Frequent changes in configuration requirements
- ✓ Changes in customization specifications due to changes in configuration and access control
- ✓ Considerably more time required for scripting configuration and security matrix test suites
- ✓ Increased bug rate for configuration and security matrix on single entity
- ✓ Problems in maintaining changes in access controls uniformly, due to applications often being replicated across multiple servers
- ✓ Thorough understanding of the business is of paramount importance to create secure solution on configuration and attribute level access control

Retail Application Testing – Best Practices

It is crucial that organizations define a robust and certified process for software development and quality assurance. This process would serve as a guideline that may evolve over time. The process must be made official and followed properly to establish an efficient and mature workflow, thereby adding more value to the solutions offered by the organization. For this, it is imperative that the system analyst has a deep understanding of both the business and the software development life cycle.

Metrics must be created and maintained to keep a tab on software quality, comparing its performance before and after improvements are made and increasing the value and effectiveness of the testing process. Changes in configuration must be tracked and recorded to ensure controlled results and run tests in environments that closely resemble real production environments.

Documents – Functional Specification and Use Case Scenarios

Use cases must be incorporated in scripts to assess performance from various angles. Requirements must be clarified with the process consultant and any queries regarding the same should be communicated to the client. Related technical issues must be discussed with the solution architect/team lead. Test scripts must be reviewed by the process consultant to ensure any gaps in business needs/use cases are closed. Traceability matrix must be maintained

for the changed requirements and shared with the customers to gain an additional perspective on what is being developed in the scripts.

Test Planning

The test plan must go through two reviews to ensure that all the testing activities are incorporated. The project manager must review it on the basis of project plan dates, while the test manager should review it based on the scope of testing. The test manager must take care of the estimated efforts in terms of time and resources required for architectural and development. The risk mitigation strategy must be devised based on the previous project experience.

Data Model

The results of and comments on configuration execution must be maintained on the same sheet, and later uploaded in Bugzilla for defect reference to save time. The change control track feature must be used to review changes in configuration (after they are made) or grant/deny proposed changes. The changes must be discussed with configuration management lead. The configuration must be checked and tested for any changes made. Configuration experts should be involved in the execution of data models. Quality automation tool can be used for configuration testing and regression testing. The test lead should ensure that the test environment is in line with what the changed configuration and test processes require.

Automated test scripts should be maintained for execution on all properties of an attribute, and test cases must be prepared for execution of configuration of an attribute used as reusable component. This would save time.

Security Matrix Testing (ACL)

This test is conducted after configuration and functional testing. Traceability matrix must be maintained on both access control and attribute level. Security access permission must be maintained uniformly on all servers and regression testing should be carried out for security and attribute levels. Reports must be maintained for execution and as reference document. This practice reduces time of execution as well as rising defect in tool.

Automated test suite for security matrix facilitates greater test coverage, reduce risk, enable faster execution, deliver higher test accuracy, find more defects earlier, facilitates test reuse and support regression testing.

Functional Testing

Functional testing scripts should go for three rounds of review. The solution architect must identify technical glitches, process consultant should check if the business requirements are met in the test case and maintain traceability between the requirements, test cases and bugs. Requirements must be clarified with the process consultant and any queries on the same must be communicated to the client. Related technical issues should be discussed with the solution architect/team lead.



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