**Automated Testing for an E-commerce Website**

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**1.Test Planning**

* 1. Test Strategy Document

1. **Objectives of testing**:

-The objective of the testing e-commerce website is to ensures a smooth and user-friendly interface, improving the overall shopping experience without any defect or failure.

- Website should have a simple, effective design, pages load quickly and it is easy to navigate by considering all its attributes like Reliability, Scalability, Portability, Usability.

1. **Scope of testing:**

* The scope of testing for eCommerce websites is broad and covers all aspects of the website, including front-end and back-end functionalities. Some of the key areas that need to be tested include:

**User Interface**: The user interface of an eCommerce website should be tested to ensure that it is user-friendly and easy to navigate. This includes testing the layout, color scheme, font size, and overall design of the website.

**Functionality**: The functionality of the eCommerce website should be tested to ensure that all features and functionalities are working as intended. This includes testing product search, product filtering, product descriptions, shopping cart, and checkout process.

**Performance**: The performance of the eCommerce website should be tested to ensure that it is fast and responsive. This includes testing website loading time, page speed, and website responsiveness on different devices.

**Security**: The security of the eCommerce website should be tested to ensure that it is secure and protected from any unauthorised access or data breaches.

1. **Testing levels**

* To ensure proper working of each modules we need to go through different testing levels:

Unit, Integration, System, Acceptance testing.

**Unit Testing**- Under this testing we need to ensure each module as a single unit is working as per the requirement or not.

Eg- Login Module, Cart module, Search Page module, Payment module.

All modules has to be tested individually to check their working.

**Integration testing**- Under this testing we need to ensure one or more individual modules when interacted with each other are they working properly or not, proper navigation is happening, data transfer is successful or not. These things are checked according to the requirement.

**System Testing** – This testing includes testing of fully integrated Software system.

To check end to end flow of application , checking end feature, navigation, data transfer through all the modules .These aspects are checked thoroughly.

Here testing environment is similar to production environment.

**Acceptance testing**- This testing is done by customer before accepting the final product and check if application is working as per business scenarios.

We need to concentrate on features and scenarios which are regularly used.

It includes Alpha and Beta testing where user can directly use and give us a feedback to improve performance or functionality if needed.

1. **Testing types** (e.g., functional, usability, performance)

* For testing, we need to go checking functionality, testing performance, usability which will completely help us to test website in all aspects.

**Functional testing-** As quality is important for customer satisfaction and retention, enterprises rely on functional testing to detect glitches and identify critical bugs in e-commerce apps or websites that can degrade the customer experience. Functional testing helps the testing teams to ensure that all features work according to requirements.

**Usability testing**- This testing comes under non functional testing. Checking user-friendliness, efficiency, accuracy of application.

-Primary purpose is to check application is easy to use for end user, easy to understand, look and feel, faster to accesss, good error handling.

**Performance testing**- This testing checks the behavior of application by applying some load.

-This defines how quickly server respond to client’s request. We need to focus on factors like Response time, load and stability.

-Load testing, Stress testing, Scalability testing needs to be performed.

1. **Entry and exit criteria**

Each test case should contain specific entry and exit criteria, which guides testers in determining when a test is considered to be complete. Exit criteria is important because They prevent tests from ending too early,for example, because of time pressure or because of resource shortages.

In other words, entry and exit criteria will help determine when tests for the E-Commerce Website should be started and stopped. By identifying these items up front, testers and developers can rely on criteria to determine when to stop testing: “To make a right decision to stop testing is an arduous resolution, the pre-defined exit criteria can help simplify this process. It is a very important step where all test processes get stopped and this decision is either made by the tester or the whole team together”.

Having clear entry and exit criteria allows testers to have increased confidence in

the software.

1. **Test environment and tools**

-Create separate[test environments](https://www.javatpoint.com/test-environment), just like a mock store, to perform testing without any impact on the live website.

- Developer provides testing environment like Production, UAT, testing, Customer environment.

**Tools and Framework**: For Automation we need to use Selenium for testing and creating Automation scripts for Web Application, TestNG for report generation, Jenkins- For test case execution, JIRA- for bug tracking.

Programming language- Java or Python , IDE- Intellij or Eclipse .

1. **Risk Analysis**

**-** Risk-based prioritization will be implemented in order to ensure that the most significant defects within the E-Commerce Website are revealed as early as possible. This will prevent critical defects from having downstream affects while reducing the time and cost of handling critical defects that make it to production. While test cases can be prioritized based on multiple factors, including frequency of function use, visibility, priority of functional and non-functional requirements from the customer, severity, risk, and complexity, prioritization by risk is one of the best methods for selecting test cases. According to Software testing foundations: Risk based prioritization of the tests ensures that risky product parts are tested more intensively and earlier than parts with lower risk. Severe problems (causing much corrective work or serious delays) are found as early as possible.

* 1. Test Plan

1. **Test deliverables**:

Test deliverables are the documents that describe the testing process and can be used to document your efforts. Each test process has its own set of deliverables .

The following are a list of test deliverables:

The test deliverables prepared during the process of software testing are as follows

1. [Test Strategy:](https://www.softwaretestingmaterial.com/test-strategy/) Test Strategy is a high-level document (static document) and usually developed by a project manager. It is a document which captures the approach on how we go about testing the product and achieve the goals. It is normally derived from the Business Requirement Specification (BRS). Documents like Test Plan are prepared by keeping this document as a base.
2. [Test Plan](https://www.softwaretestingmaterial.com/test-plan-template/): Test plan document is a document which contains the plan for all the testing activities to be done to deliver a quality product. The test Plan document is derived from the Product Description, SRS, or Use Case documents for all future activities of the project. It is usually prepared by the Test Lead or Test Manager.
3. [Test Cases](https://www.softwaretestingmaterial.com/test-case-template-with-explanation/)/Scripts: Test cases are the set of positive and negative executable steps of a test scenario which has a set of pre-conditions, test data, expected result, post-conditions and actual results.
4. Test Data: Test data is the data that is used by the testers to run the test cases. Whilst running the test cases, testers need to enter some input data. To do so, testers prepare test data. It can be prepared manually and also by using tools.

For example, To test a basic login functionality having a user id, password fields. We need to enter some data in the user id and password fields. So we need to collect some test data.

1. [Defect Report/Bug Report](https://www.softwaretestingmaterial.com/bug-report-template/): The purpose of using Defect report template or Bug report template is to convey the detailed information (like environment details, steps to reproduce etc.,) about the bug to the developers. It allows developers to replicate the bug easily.
2. Test Execution Report: It contains the test results and the summary of test execution activities.
3. Test closure report: It gives a detailed analysis of the bugs found, bugs removed and discrepancies found in the software.
4. **Test resources-**

The most important part of a test plan is the definition of resources needed. We need to find the resources which are experienced and knowledgeable at both Automation testing and Manual testing- UI testing, API, Performance testing. It includes Programming languagelike Java, tools like Selenium, Jenkins, JIRA.

1. **Test data and environment setup**

For preparation of Test data we need to use different techniques : Equivalence partitioning, Boundary value analysis, descision table.

The test environment requires setting up of various number of distinct areas like,

Step 1) Setup of Test Server

Every test may not be executed on a local machine. It may need establishing a test server, which can support applications.

For example, Fedora set up for [PHP](https://www.guru99.com/php-tutorials.html), Java-based applications with or without mail servers, cron set up, Java-based applications, etc.

Step 2) Network

Network set up as per the test requirement. It includes,

* Internet setup
* LAN Wifi setup
* Private network setup

It ensures that the congestion that occurs during testing doesn’t affect other members. (Developers, designers, content writers, etc.)

Step 3) Test PC setup

For web testing, you may need to set up different browsers for different testers. For desktop applications, you need various types of OS for different testers PCs.

Step 4) Bug Reporting

Bug reporting tools should be provided to testers.

## Test Environment Checklist

### Hardware

* Check whether required equipment for testing is available? If this is not the case, analyze the supply time!
* Check whether peripheral equipment is available? Such as scanners, special printers, handhelds, etc.

### Software / connections

* Are the needed applications specified? An application such as excel, word, drawings, etc.
* For the new software does the test environment exist for the organization? Has the organization experience with use and maintenance of the software?

### Environmental data

* Check whether the standard test data sets are available? With the regression test set, consider the [Defect](https://www.guru99.com/defect-management-process.html) administration to collect test data.
* Do agreements with the test data owners about the test data exist? Consider functional maintenance.

1. **Test execution and reporting**

* For test execution , to trigger test case and test suites we will use Jenkins . Also we need to schedule as such as soon as test case execution is over we need to send execution result to the client email.
* For reporting we will use Extent report which comes in TestNG framework.

**2.Test case Design**

**2.1 Functional test cases:**

* Test case for User Registration:



2.2 **Edge and Boundary test case**

**User Registration:** Mobile No field- It should have 10 digits only (excluding country code). And should include only numbers

* 1. Test the field by entering max 10 digit no: 9999999999
  2. Test the field by entering min 10 digit no: 0000000000
  3. Test the field by entering 9 digits.
  4. Test the field by entering 0 digit.(blank).
  5. Test the field by using alphabets and Special characters.

**3.Test Automation**

**3.1 Test Automation Framework**

**-** Selenium is the Framework which we have to select to Automate Web Application.

- It is the open source Automation Framework which is used for Web based test cases. It has many features which makes it easy for tester to test the Application.

- Features include- Supports Cross platform testing, supports multiple browser, multiple language.

-Selenium can be integrated with Maven- for downloading all the dependencies which we need during our project, can be integrated with TestNg- for generating reports of test execution result, can be integrated with Jenkins for Automatic execution of all our test suites.

🡪 Framework which we will be building is purely on Page Object Model.

* All the web pages will have different .java files, all the methods related to the particular web page will be on one particular .java file. Xpaths or objects of a particular page will be on different or separate xml file.
* For eg: All the methods related to home page will be on homepage.java file and objects are stored in homepage.xml file.
* Suppose there is a test case, we will first initialize our web driver from Driver class, and also we will get all the methods from different java class through inheritance.
* For execution we will use Testng. So all the test cases which we want to execute we will put them in testNg.xml and execute at once and then report gets generated as we are using Extent report and then send it to client.

**Automated test scripts and Test Data Management**



**Test Data:**

a. first and last name(should contain only alphabets, max alphabets can contain are 15):

1) Test name field by entering more than alphabets.

2) Test name field by keeping it blank.

3) Test name field by entering special characters.

b. Mobile No field- It should have 10 digits only (excluding country code). And should include only numbers

* 1. Test the field by entering max 10 digit no: 9999999999
  2. Test the field by entering min 10 digit no: 0000000000
  3. Test the field by entering 9 digits.
  4. Test the field by entering 0 digit.(blank).
  5. Test the field by using alphabets and Special characters.

c. Email (should contains domain name, should have @ in mail id)

1) Test the field by using different domain name like gmail, ymail.

2) Test the field without entering @.

3) Test without using .com.