**\* Testing Technique**

**1. Static Testing:**

* **Definition:** Reviewing and evaluating software documentation, code, and design without executing the program.
* **Example (Ecommerce):** Reviewing the codebase and design documents of an online shopping cart system before it is implemented.
* **Testing Category:** White Box Testing
* **Performed by:** Developers or peers in the development team

**2. Dynamic Testing:**

* **Definition:** Involves the execution of the software to evaluate its behavior during runtime.
* **Example (Ecommerce):** Running test cases to ensure that the shopping cart updates correctly as users add or remove items.
* **Testing Category:** Black Box Testing
* **Performed by:** QA professionals

**\* Testing Category**

**1. White Box Testing:**

* **Definition:** Examines the internal logic and structure of a system, testing individual components and their interactions.
* **Example (Ecommerce):** Verifying that the discount calculation algorithm in the shopping cart functions correctly.
* **Testing Category:** Structural Testing
* **Performed by:** Developers or specialized testing teams

**2. Black Box Testing:**

* **Definition:** Focuses on evaluating the functionality of a system without knowledge of its internal code or structure.
* **Example (Ecommerce):** Testing the user interface and functionality of an online store without access to the source code.
* **Testing Category:** Functional Testing
* **Performed by:** QA professionals

**3. Grey Box Testing:**

* **Definition:** Combines elements of both white box and black box testing, where testers have partial knowledge of the internal structure.
* **Example (Ecommerce):** Testing the interaction between the database and the frontend without full knowledge of the code.
* **Testing Category:** Hybrid Testing
* **Performed by:** QA professionals or developers with limited knowledge of the system

**4. Gorilla Testing:**

* **Definition:** Involves testing a specific module or functionality intensively to uncover defects.
* **Example (Ecommerce):** Focusing on rigorous testing of the payment processing module to identify any vulnerabilities.
* **Testing Category:** Black Box Testing
* **Performed by:** QA professionals or specialized testing teams with a focus on the targeted module.

**\* Testing Types**

**Manual Testing** is a type of software testing in which test cases are executed manually by a tester without using any automated tools. The purpose of Manual Testing is to identify the bugs, issues, and defects in the software application. Manual software testing is the most primitive technique of all testing types and it helps to find critical bugs in the software application.

Any new application must be manually tested before its testing can be automated. Manual Software Testing requires more effort but is necessary to check automation feasibility. Manual Testing concepts does not require knowledge of any testing tool. One of the Software Testing Fundamental is “**100% Automation is not possible**“. This makes Manual Testing imperative.

**Automation Testing** is a software testing technique that performs using special automated testing software tools to execute a test case suite. Successive development cycles will require execution of same test suite repeatedly. Using a test automation tool, it’s possible to record this test suite and re-play it as required. Once the test suite is automated, no human intervention is required. This improved ROI of Test Automation. The goal of Automation is to reduce the number of test cases to be run manually and not to eliminate [Manual Testing](https://www.guru99.com/manual-testing.html) altogether.

Test cases to be automated can be selected using the following criterion to increase the automation ROI

* High Risk – Business Critical test cases
* Test cases that are repeatedly executed
* Test Cases that are very tedious or difficult to perform manually
* Test Cases which are time-consuming

**The following category of test cases are not suitable for automation:**

* Test Cases that are newly designed and not executed manually at least once
* Test Cases for which the requirements are frequently changing
* Test cases which are executed on an ad-hoc basis.

**### Functional Testing:** is a type of software testing that validates the software system against the functional requirements/specifications. The purpose of Functional tests is to test each function of the software application, by providing appropriate input, verifying the output against the Functional requirements.

Functional testing mainly involves black box testing and it is not concerned about the source code of the application. This testing checks User Interface, APIs, Database, Security, Client/Server communication and other functionality of the Application Under Test. The testing can be done either manually or using automation.

**1. Unit Testing:**

* + **Definition:** Testing individual components or modules of a system to ensure they function correctly.
  + **Ecommerce Example:** Verifying that the product catalog component correctly displays product details.
  + **Performed by:** Developers
  + **Testing Category:** White Box Testing

**2. Integration Testing:**

* **Definition:** Checking interactions between integrated components to ensure they work as intended.
* **Ecommerce Example:** Confirming that the shopping cart integrates seamlessly with the payment gateway.
* **Performed by:** Developers or Testers
* **Testing Category:** White Box or Black Box Testing

**3. System Testing:**

* **Definition:** Evaluating the entire system to validate that it meets specified requirements.
* **Ecommerce Example:** Ensuring that the entire ecommerce platform functions as expected, including user registration, browsing, and purchasing.
* **Performed by:** Testers
* **Testing Category:** Black Box Testing

**I. End to End Testing:**

* + **Definition:** Testing the complete flow of a system, simulating real world scenarios.
  + **Ecommerce Example:** Testing the entire purchase process from product selection to payment and order confirmation.
  + **Performed by:** Testers
  + **Testing Category:** Black Box Testing

**II. Smoke Testing:**

* + - **Definition:** Checking if the essential functions of an application work without detailed testing.
    - **Ecommerce Example:** Verifying that the main page loads and basic navigation works.
    - **Performed by:** Testers
    - **Testing Category:** Black Box Testing

**III. Sanity Testing:**

* + - **Definition:** Verifying specific functionalities after changes to ensure no major issues exist.
    - **Ecommerce Example:** Testing the login functionality after a recent code change.
    - **Performed by:** Testers
    - **Testing Category:** Black Box Testing

**IV. Happy Path Testing:**

* + - **Definition:** Testing the system under normal, expected conditions.
    - **Ecommerce Example:** Completing a purchase with all correct information.
    - **Performed by:** Testers
    - **Testing Category:** Black Box Testing

**V. Monkey Testing:**

* + - **Definition:** Randomly testing the application without a specific test plan.
    - **Ecommerce Example:** Clicking various buttons and links in a random order to identify unexpected behaviors.
    - **Performed by:** Testers
    - **Testing Category:** Black Box Testing

**4. Interface Testing:**

* **Definition:** Verifying interactions between different software components.
* **Ecommerce Example:** Checking communication between the frontend and backend systems.
* **Performed by:** Testers
* **Testing Category:** Black Box Testing

**5. Regression Testing:**

* **Definition:** Ensuring that new code changes do not negatively impact existing functionalities.
* **Ecommerce Example:** Verifying that a recent code update did not introduce errors in the checkout process.
* **Performed by:** Testers
* **Testing Category:** Black Box Testing

**6. Acceptance Testing:**

* + **Definition:** Validating whether the system meets business requirements.
  + **Ecommerce Example:** Checking if the ecommerce platform fulfills specified business criteria.
  + **Performed by:** Users or Testers
  + **Testing Category:** Black Box Testing

**I. Alpha Testing:**

* + - **Definition:** Assessing the software in a controlled environment before releasing it to a larger audience.
    - **Ecommerce Example:** Testing an early version of the ecommerce platform with a select group of users.
    - **Performed by:** Users or Testers
    - **Testing Category:** Black Box Testing

**II. Beta Testing:**

* + - **Definition:** Collecting user feedback on a pre released version of the software.
    - **Ecommerce Example:** Inviting a group of customers to test and provide feedback on a new website feature.
    - **Performed by:** Users or Testers
    - **Testing Category:** Black Box Testing

**7. Component Testing:**

* + **Definition:** Testing individual software components or modules in isolation.
  + **Ecommerce Example:** Testing the search functionality of an ecommerce website independently.
  + **Performed by:** Developers or Testers
  + **Testing Category:** White Box Testing

**8. Retesting:**

* **Retesting** is a software testing activity that involves the execution of test cases for a specific defect or issue that was identified and reported earlier in the testing process. The purpose of retesting is to verify whether the reported defect has been fixed correctly.

**### NonFunctional Testing:** is defined as a type of Software testing to check non-functional aspects (performance, usability, reliability, etc) of a software application. It is designed to test the readiness of a system as per nonfunctional parameters which are never addressed by functional testing.

An excellent example of non-functional test would be to check how many people can simultaneously login into a software. Non-functional testing is equally important as [functional testing](https://www.guru99.com/functional-testing.html) and affects client satisfaction.

**1. Security Testing:**

* + **Definition:** Evaluating the system's ability to protect data and maintain functionality under potential security threats.
  + **Ecommerce Example:** Checking the encryption and security measures in place during online transactions.
  + **Performed by:** Testers
  + **Testing Category:** Black Box Testing

**I. Penetration Testing:**

* + - **Definition:** Simulating cyberattacks to identify vulnerabilities in the system.
    - **Ecommerce Example:** Attempting to exploit weaknesses in the website's security.
    - **Performed by:** Testers
    - **Testing Category:** Black Box Testing

**2. Performance Testing:**

* + **Definition:** Assessing the system's responsiveness and stability under various conditions.
  + **Ecommerce Example:** Testing how the website handles a high volume of simultaneous user interactions.
  + **Performed by:** Testers
  + **Testing Category:** Black Box Testing

**I. Load Testing:**

* + - **Definition:** Evaluating the system's performance under expected load conditions.
    - **Ecommerce Example:** Simulating a large number of users accessing the website simultaneously.
    - **Performed by:** Testers
    - **Testing Category:** Black Box Testing

**II. Stress Testing:**

* + - **Definition:** Assessing the system's behavior under extreme conditions to identify breaking points.
    - **Ecommerce Example:** Checking how the website handles a sudden surge in traffic.
    - **Performed by:** Testers
    - **Testing Category:** Black Box Testing

**III. Soak Testing:**

* + - **Definition:** Evaluating system performance over an extended period to identify issues related to prolonged use.
    - **Ecommerce Example:** Running continuous transactions for an extended period to detect memory leaks.
    - **Performed by:** Testers
    - **Testing Category:** Black Box Testing

**IV. Spike Testing:**

* + - **Definition:** Testing the system's response to sudden and extreme increases in load.
    - **Ecommerce Example:** Simulating a sudden influx of users during a flash sale.
    - **Performed by:** Testers
    - **Testing Category:** Black Box Testing

**V. Volume Testing:**

* + - **Definition:** Assessing the system's performance with a large amount of data.
    - **Ecommerce Example:** Testing how the system handles a massive product catalog.
    - **Performed by:** Testers
    - **Testing Category:** Black Box Testing

**VI. Endurance Testing:**

* + - **Definition:** Checking the system's ability to handle a sustained workload over an extended period.
    - **Ecommerce Example:** Running continuous transactions for an entire day to ensure stability.
    - **Performed by:** Testers
    - **Testing Category:** Black Box Testing

**VII. Scalability Testing:**

* + - **Definition:** Evaluates a system's ability to handle growing amounts of data, users, or transactions without compromising performance.
    - **Example (Ecommerce):** Simulating a sudden increase in website traffic during a flash sale to ensure the system can handle the load.
    - **Testing Category:** Performance Testing
    - **Performed by:** Performance Engineers

**3. Usability Testing:**

* + **Definition:** Assesses how userfriendly and intuitive a system is by evaluating the user interface and overall user experience.
  + **Example (Ecommerce):** Testing how easily customers can navigate the online store, find products, and complete the checkout process.
  + **Testing Category:** Black Box Testing
  + **Performed by:** Usability Testers or Quality Assurance (QA) professionals

**I. Exploratory Testing:**

* + - **Definition:** Informal testing approach where testers explore the application, design test cases onthefly, and execute them to uncover defects.
    - **Example (Ecommerce):** Testers navigating through the website without predefined test scripts, trying different scenarios to find unexpected issues.
    - **Testing Category:** Black Box Testing
    - **Performed by:** Testers or QA professionals

**II. CrossBrowser Testing:**

* + - **Definition:** Verifies that a web application functions correctly across different web browsers and browser versions.
    - **Example (Ecommerce):** Checking if an online store works seamlessly on Chrome, Firefox, Safari, and Internet Explorer.
    - **Testing Category:** Black Box Testing
    - **Performed by:** QA professionals

**III. Accessibility Testing:**

* + - **Definition:** Ensures that a system is accessible to users with disabilities, conforming to accessibility standards.
    - **Example (Ecommerce):** Testing whether an online store is navigable using screen readers for visually impaired users.
    - **Testing Category:** Black Box Testing
    - **Performed by:** Accessibility Testers or QA professionals

**4. Compatibility Testing:**

* + **Definition:** Ensures that a system functions correctly across different environments, devices, and configurations.
  + **Example (Ecommerce):** Verifying that an online store works on various devices like desktops, tablets, and smartphones.
  + **Testing Category:** Black Box Testing
  + **Performed by:** QA professionals

**5. Reliability Testing:**

* + **Definition:** Evaluates the system's ability to perform consistently and reliably under various conditions.
  + **Example (Ecommerce):** Testing the reliability of the order processing system to ensure it doesn't fail during peak shopping times.
  + **Testing Category:** Black Box Testing
  + **Performed by:** QA professionals

**6. Installation Testing:**

* + **Definition:** Verifies that the software is installed, configured, and uninstalled correctly without causing issues.
  + **Example (Ecommerce):** Testing the installation process of an ecommerce platform on different operating systems.
  + **Testing Category:** Black Box Testing
  + **Performed by:** QA professionals

**7. Documentation Testing:**

* + **Definition:** Verifies that the system's documentation is accurate, complete, and userfriendly.
  + **Example (Ecommerce):** Reviewing user manuals and help guides for an online store to ensure they provide clear instructions.
  + **Testing Category:** Black Box Testing
  + **Performed by:** QA professionals or Technical Writers

**Positive Testing** is a type of testing which is performed on a software application by providing the valid data sets as an input. It checks whether the software application behaves as expected with positive inputs or not. Positive testing is performed in order to check whether the software application does exactly what it is expected to do.

For example –



There is a text box in an application which can accept only numbers. Entering values up to 99999 will be acceptable by the system and any other values apart from this should not be acceptable. To do positive testing, set the valid input values from 0 to 99999 and check whether the system is accepting the values.

**Negative Testing** is a testing method performed on the software application by providing invalid or improper data sets as input. It checks whether the software application behaves as expected with the negative or unwanted user inputs. The purpose of negative testing is to ensure that the software application does not crash and remains stable with invalid data inputs.

For example –



Negative testing can be performed by entering characters A to Z or from a to z. Either software system should not accept the values or else it should throw an error message for these invalid data inputs.

In both the testing, the following needs to be considered:

* Input data
* An action which needs to be performed
* Output Result

**Testing Technique used for Positive and Negative Testing:**

* Boundary Value Analysis
* Equivalence Partitioning