

Testing Types

Testing types or you can say test targets. Selecting the appropriate test type helps make and communicate decisions against test objectives.

A test type focuses on particular test objectives, which could be the functional testing performed by the component and system testing.

A non-functional testing quality characteristic for example reliability and usability testing. Confirming that defect has been fixed (confirmation testing or re-testing) and looking for unintended changes known as regression testing.

Let's discuss functional testing. What are functional testing and its objective?

The function of a system or component is 'what it does'. This is mostly explained in SRS, in the functional specification, and use cases. Some functions are 'assumed' to be provided that are not documented but are part of the requirements for a system.

Sometimes and somewhere you also may be faced with an interview question like how you will test software if there is no documentation provided.

It is really difficult to test against undocumented and implicit requirements. Functional tests are based on these functions, described in the document and understood by the testers, and may be performed at all test levels.

Functional testing considers the specified behavior and is often also referred to as black-box testing, so black-box techniques may be used to derive test conditions and test cases for the functionality of the component or system.

Function testing can, based on ISO 9126, be done by focusing on suitability, interoperability, security, accuracy, and compliance.

Functional testing can be done from two perspectives:

1. Requirements-based testing
2. Business process-based testing

Requirement-based testing uses a specification of the functional document. We can also properties the requirements based on risk criteria so this will ensure that the most critical test coverage is included in the testing efforts.

Business-process-based testing is based on the knowledge of the business. Business processes describe the scenarios involved in the day-to-day business use of the system.

The techniques used for functional testing are mostly specification-based, experience-based techniques are also used. test conditions and test cases are derived from the functionality of the components and system.

Non-functional testing means testing of the quality characteristics or non-functional attributes of the system e.g Load testing, performance testing, stress testing, usability testing, maintainability testing, reliability testing, and portability testing. So The non-functional testing we will do to check 'how well' the system works.

ISO /IEC 9126, 2001 a set of quality characteristics. The SIO 9126, defines six quality characteristics and the subdivision of each quality characteristic into a number of sub-characteristics.

The characteristics and sub-characteristics are as follows:

1. **Functionality:** which consists of five sub-characteristics – suitability accuracy, security interoperability, and compliances, this characteristic deals with functional testing.
2. **Reliability** which is divided into sub-characteristics robustness, fault-tolerance, recoverability, and compliances.
3. **Usability** which consists of four sub-characteristics understandability, learnability, operability, attractiveness, and compliances.
4. **Efficiency**, which is further divided into performance, resource utilization, and compliance.
5. **Maintainability**, which consists of five further sub-characteristics analyzability, changeability, stability, testability, and compliances.
6. **Portability has five sub-characteristics:** adaptability, installability, co-existence, replaceability, and compliances.

Note: Some in ISTQB asked questions about ISO standards so keep the above details carefully in knowledge.

Structural testing (white box testing), or 'gray-box' so in this part of testing we are interested in 'what is happening inside the box'.

Structural testing or white box testing drives tests based on the system's internal structure. Here internal structure may include code, architecture, workflows, and data flows within the system. White box testing is most often used to measure the thoroughness of testing through the coverage of a set of structural elements or coverage items.

Structural testing can occur at any test level, or it is generally applied at the component and integration level generally it is less likely at a higher level, except at business-process testing.

The techniques used for structural-based testing are structure bases techniques, also known as white box techniques. The control flow model is also used to support structural testing.

Confirmation and Regression testing (testing related to change)

When changes are made to the software, either to correct the bug, new changing in functionality or we can say that if you have made any change to the software, you will have change the way it functions, the way it performs, and its structure in that case we need to do confirmation testing.

Confirmation testing or re-testing: when a test is failed and report the defect and now we can expect a new version of the software in which the defect is fixed, so in these types of scenarios we need to rerun the test with the same environment, the same data to confirm the defect is fixed. This is known as confirmation testing or re-testing.

The bug fixing may introduce or uncover a different defect elsewhere in the software. The way to detect these kinds of defect needs to do regression testing.

Regression Testing, regression testing involves executing test cases that have been executed before. The difference is that , for regression testing, the test cases probably passed the last time they were executed. The purpose of regression testing is to verify that modifications in the software or the environment does not cause unintended adverse effects and that the system still meets its requirements.

The regression test suit would be executed every time a new version of software is produce so this make them ideal for automation.

Maintenance Testing

Testing that is executed during the life cycle phase is called ‘maintenance testing’. Maintenance testing is different from maintainability testing which how it is easy to maintain the system.

A maintenance test process usually begins with the receipt of an application for a change or release plan.

Usually maintenance testing consist two parts:

1. Testing the changes
2. Regression test to show that the rest of system has not been affected by the maintenance work.

A major and important activity within maintenance testing is **impact analysis**.

In Impact Analysis, with stakeholder, a decision will be made on what part of the system may be unintentionally affected and therefore need careful regression testing.

Risk analysis will help to decide where to focus regression testing.

As mentioned that maintenance testing is done on the existing operational system. it is triggered by modification. Migration or retirement of the system. Modifications include planned enhancement changes and corrective and emergency changes.