

## Types of Software Testing : All You Need to Know About Testing Types

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A Data Science Enthusiast with in-hand skills in programming languages such as...

*"Quality is never an accident; it is always the result of intelligent effort."* – John Ruskin. Today's world of technology is completely dominated by machines, and their behavior is controlled by the software powering it. Quality Assurance or [Software Testing](#) is crucial because it identifies errors or bugs from a system at the beginning. This article on "Types of Software Testing" will provide you with in-depth knowledge about the different types of Software Testing in the following sequence :

- [Introduction to Software Testing](#)
- [Why is Software Testing required?](#)
- [Software Testing Life Cycle](#)
- [Types of Software Testing](#)

### Introduction to Software Testing

[Software Testing](#) is a process of evaluating the functionality of a software application to find any software bugs. It checks whether the developed software met the specified requirements and identifies any defect in the software in order to produce a quality product.



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It is also stated as the process of verifying and validating a software product. It checks whether the software product:

- Meets the business and technical requirements that guided its design and development
- Works as per the requirement
- Can be implemented with the same characteristics

Now let's move ahead with our Types of Software Testing blog and have a look at the reasons why we need Software Testing.

### Why is Software Testing Required?

The importance of software testing is imperative. Skipping this process is definitely not a good idea and it might affect the product as well as the business. To understand the importance of testing, let's have a look at some of the key points that explain why your product should undergo it :



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**Cost Effective** – Testing our project on time can save money in the long run. Software development consists of many stages and if bugs are caught in the earlier stages it costs much less to fix them.



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**Security** – This is the most sensitive and vulnerable part of software testing. Users are always looking for trusted products that they can rely on. It helps in removing problems and risks beforehand



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**Product Quality** – In order to make your product vision come to life, it has to work as planned. It is important to follow the product requirements because it helps you get the required end results.



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**Customer Satisfaction** – The ultimate goal for a product owner is to give the best customer satisfaction. Software should be tested in order to bring the best user experience possible.



These were some of the reasons that explain why we need software testing. Now let's move ahead with our Types of Software Testing blog and look at the different phases of Software Testing Life Cycle.

### Software Testing Life Cycle (STLC)

[Software Testing Life Cycle](#) is a sequence of different activities performed by the testing team to ensure the quality of the software or the product. It defines a series of activities conducted to perform Software Testing.

The different phases of Software testing life cycle are:



- **Requirement Analysis** – Requirement Analysis is the first step involved in Software testing life cycle. In this step, Quality Assurance (QA) team understands the requirement in terms of what we will testing & figure out the testable requirements.
- **Test Planning** – Test Planning is most important phase of Software testing life cycle where all testing strategy is defined. This phase is also called as Test Strategy phase. In this phase, Test team defines the effort and cost estimates for entire project. It defines the objective & scope of the project.
- **Test Case Development** – The Test case development begins once the test plan is approved.

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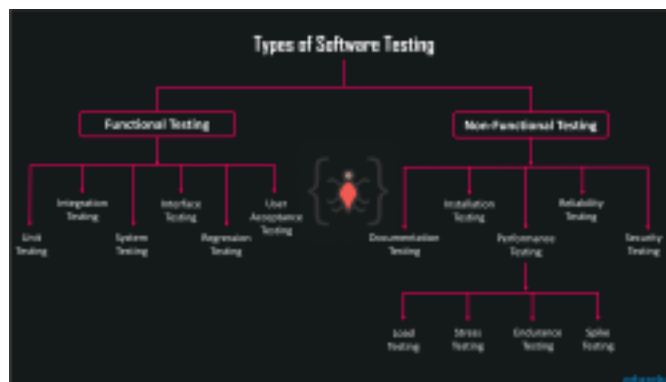
phase of STLC where testing team notes the detailed test cases. Along with test cases, testing team also prepares the test data for testing. Once the test cases are ready then these test cases are reviewed by peer members or QA lead.

- **Test Environment Setup** – Setting up the test environment is vital part of the Software Testing Life Cycle. A testing environment is a setup of software and hardware for the testing teams to execute test cases. It supports test execution with hardware, software and network configured.
- **Test Execution** – The next phase in Software Testing Life Cycle is Test Execution. Test execution is the process of executing the code and comparing the expected and actual results. When test execution begins, the test analysts start executing the test scripts based on test strategy allowed in the project.
- **Test Cycle Closure** – The final phase of the Software Testing Life Cycle is Test Cycle Closure. It involves calling out the testing team member meeting & evaluating cycle completion criteria based on Test coverage, Quality, Cost, Time, Critical Business Objectives, and Software.

Now let's move ahead with our Types of Software Testing blog and know more about the different types of testing.

## Types of Software Testing

Testing is an integral part of any successful software project. The types of software testing depend on various factors, including project requirements, budget, timeline, expertise, and suitability. The different Types of software testing are the key role where the tester determines the right testing for the apps. Functional testing and non-functional testing are the two kinds of testing performed by the QA or Software Tester.



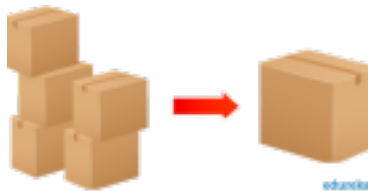
## Functional Testing

Functional Testing is defined as a type of testing which verifies that each function of the software application operates in conformance with the requirement specification. The functional testing focuses on manual as well as automation testing.

The different Types of Functional Testing include :

### Unit Testing

It is a level of software testing where individual units/ components of a software are tested. The purpose is to validate that each unit of the software performs as designed. A unit is the smallest testable part of any software. It usually has one or a few inputs and usually a single output.



### Benefits of Unit Testing

- Unit testing increases confidence in changing or maintaining code. If good unit tests are written and if they are run every time any code is changed.
- Codes are more reusable. In order to make unit testing possible, codes need to be modular.
- Development is faster. The effort required to find and fix defects found during unit testing is very less in comparison to the effort required to fix defects found during system testing or acceptance testing.
- The cost of fixing a defect detected during unit testing is lesser in comparison to that of defects detected at higher levels.
- Debugging is easy. When a test fails, only the latest changes need to be debugged.

### Integration Testing

It is a level of software testing where individual units are combined and tested as a group. It exposes faults in the interaction between integrated units.

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### Approaches of Integration Testing

- **Big Bang** is an approach to Integration Testing where all or most of the units are combined together and tested at one go. This approach is taken when the testing team receives the entire software in a bundle.
- **Top Down** is an approach to Integration Testing where top-level units are tested first and lower level units are tested step by step after that. This approach is taken when top-down development approach is followed.
- **Bottom Up** is an approach to Integration Testing where bottom level units are tested first and upper-level units step by step after that. This approach is taken when bottom-up development approach is followed.
- **Sandwich/Hybrid** is an approach to Integration Testing which is a combination of Top Down and Bottom Up approaches.

### System Testing

It is a level of software testing where a complete and integrated software is tested. The purpose of this test is to evaluate the system's compliance with the specified requirements.



### Tasks Performed by System Testing

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#### 1. System Test Plan

- Prepare
- Review
- Rework
- Baseline

#### 2. System Test Cases

- Prepare
- Review
- Rework
- Baseline

#### 3. System Test

- Perform

### Interface Testing

When an application or a software or a website is developed, then there are several components of it. Those components can be server, database etc. The connection which integrates and facilitates the communication between these components is termed as an Interface. It verifies that communication between the systems are done correctly.



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### 3 phases of Interface Testing

1. Configuration & development – When the interface is configured, and once the development starts, the configurations need to be verified as per the requirement.
2. Validation – When the development is completed, the interface needs to be validated and verified, this can be done as a part of unit testing also.
3. Maintenance – When we start developing an interface, we need to make sure that we are not introducing any defects in our code and hence tests need to be run on the interface.

### Regression Testing

Regression testing is a crucial stage for the product & very useful for the developers to identify the stability of the product with the changing requirements. Regression testing is a testing that is done to verify that a code change in the software does not impact the existing functionality of the product.



### Regression Testing Techniques

- Retest all – The entire test cases in the test suite are re-executed to ensure that there are no bugs that have occurred because of a change in the code.
- Regression Test Selection – In this method, test cases are selected from the test suite to be re-executed. Not the entire suite is re-executed. Selection of test cases is done on the basis of code change in the module.
- Test Case Prioritization – Test cases with high Priority are executed first than the ones with medium and low priority. Priority of test case depends on its criticality and its impact on the product
- Hybrid – The hybrid technique is a combination of Regression test selection and Test case Prioritization. Here we select only the test cases which are re-executed depending on their priority.

### User Acceptance Testing

Acceptance Testing is a level of software testing where a system is tested for acceptability. The purpose of this test is to evaluate the system's compliance with the business requirements and assess whether it is acceptable for delivery.



### Types of User Acceptance Testing

1. Business Acceptance Testing (BAT) – This is to assess whether the Product meets the business goals and purposes or not. It mainly focuses on business benefits which are quite challenging due to the changing market conditions.
2. Contract Acceptance Testing (CAT) – This is a contract which specifies that once the Product goes live, within a predetermined period, the acceptance test must be performed and it should pass all the acceptance use cases.
3. Operational Acceptance Testing (OAT) – This is to assess the operational readiness of the Product and is a non-functional testing. It mainly includes testing of recovery, compatibility, maintainability, technical support availability, reliability, fail-over, localization etc.
4. Alpha Testing – This is to assess the Product in the development/testing environment by a specialized testers team usually called alpha testers.
5. Beta Testing – This is to assess the Product by exposing it to the real end-users, usually called beta testers/beta users, in their environment. Continuous feedback from the users is collected and the issues are fixed.

Now that you have seen the different types of Functional Testing, let's move on with our Ty about the Non-Functional Testing types.

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## Non-Functional Testing

There are a bunch of software testing types which differentiate the job work for the QA while testing the apps. It is a testing to determine the performance of the system to major the measure, validate or verify quality attribute of the system.

The different Types of Non-Functional Testing are :

### Documentation Testing

Documentation testing helps to estimate testing efforts required and test coverage. Software documentation includes test plan, test cases, and requirements section.



### Focus areas for Testing Documentation

- Instructions – If specific instructions are provided for certain activities, its likely we will have test scenarios defined for those same activities
- Examples – step-by-step examples may be provided to explain GUI screen inputs, clarify syntax for commands or other interfaces, show expected outputs, or illustrate other important points.
- Messages – When we hit a problem, for example, an error message, we should verify that the documentation for the message is correct.
- Samples – samples are sometimes documented for such things as initialization or tuning parameter input files.

### Installation Testing

Installation testing is a type of quality assurance work in the software industry that converges on what customers will need to do to install and set up the new software successfully. The testing process may involve full, partial or upgrades install/uninstall processes.



### Installation Testing Tips

1. Install Full Version Of Application
2. Automate testing efforts
3. Required Disk Space check in installation
4. Use of Distributed Testing Environment
5. Automate the check of files installed after installation
6. Confirm for registry changes after installation
7. Negative testing in Installation Testing
8. Uninstallation testing

### Performance Testing

Performance Testing is defined as a type of software testing to ensure software applications will perform well under their expected workload.



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## Types of Performance Testing

- **Load Testing** is a type of performance testing conducted to evaluate the behavior of a system at increasing workload.
- **Stress Testing** is a type of performance testing conducted to evaluate the behavior of a system at or beyond the limits of its anticipated workload.
- **Endurance Testing** is a type of performance testing conducted to evaluate the behavior of a system when a significant workload is given continuously.
- **Spike Testing** is a type of performance testing conducted to evaluate the behavior of a system when the load is suddenly and substantially increased.

## Reliability Testing

Reliability testing assures that the product is fault free and is reliable for its intended purpose. It is about exercising an application so that failures are discovered before the system deployed.



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## Types of Reliability Testing

1. **Feature test:** Each function in the software should be executed at least once. Also, interaction between two or more functions should be reduced
2. **Regression test:** Whenever any new functionality is added or old functionalities are removed in an application, it undergoes a regression test to make sure no new bugs are introduced.
3. **Load test:** Load test is done to test whether the application is supporting the required load without getting Breakdown. In order to find the breakpoint of an application, the load is gradually increased until the application gets hung, breakdown, unavailable, etc.
4. **Objectives of Reliability Testing:** Restrictions like software behavior under given conditions, feasible objectives and time constraints are applicable before defining objectives of the reliability testing.

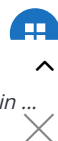
## Security Testing

Security testing is a variant of software testing which ensures that system and applications in an organization are free from loopholes. Security testing is about to find all possible weaknesses of the system which might result in a loss of information at the hands of the employees.



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## Focus Areas

- Network security: This involves looking for vulnerabilities in the network infrastructure.
- System software security: This involves assessing weaknesses in the various software the application depends on.
- Client-side application security: This deals with ensuring that the client cannot be manipulated.
- Server-side application security: This involves making sure that the server code and its technologies are robust enough to fend off any intrusion.

These were the different types of Software Testing that we need in our everyday life in order to build an error free product or application.

## Types of Software Testing | Edureka



This video covers the various types of functional and non-functional testing.

Now with this, we come to an end to this "Types of Software Testing" blog. I Hope you guys enjoyed this article and understood what is software testing and the different Types of Software testing. Now that you have understood the types of testing, check out the [Software Testing Fundamentals Course](#) by Edureka, a trusted online learning company with a network of more than 250,000 satisfied learners spread across the globe. This course is designed to introduce you to the complete software testing life-cycle. You will be learning different levels of testing, test environment setup, test case design technique, test data creation, test execution, bug reporting, CI/CD pipeline in DevOps, and other essential concepts of software testing. Got a question for us? Please mention it in the comments section of "Types of Software Testing" and we will get back to you.

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[William Hruska](#) says:

Jun 18, 2020 at 8:28 am GMT

Great post. Really helpful for software testers. Keep up the good work. I would also like to share something on [types of software testing](#). I hope it is also helpful to the readers.

[Reply](#)



Serena Gray says:

Jun 18, 2020 at 8:28 am GMT

This is an interesting article and gives a compelling perspective on the types of software testing. Thank you for sharing.

Regards,

[Serena Gray](#).

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