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# Types of Testing


# Types of Testing

Software Testing Type is a classification of different testing activities into categories, each having, a defined test objective, test strategy, and test deliverables.

# Functional Testing

Functional testing means testing the application against business requirements. Functional testing is executed using the functional specifications given by the client or by the design specifications according to use cases given by the design team. Role of functional testing is to validating the behavior of an application.

Functional testing is more important because it always verifies that your system is fixed for release.

**Functional and Non Functional Test Cases**

Functional test cases target business goals and non functional test cases target performance, resource utilization, usability, compatibility etc.

Functional testing is a part of system testing.

# Smoke Testing

Smoke Testing is considered as the surface level testing which is always used to validate that build provided by development to QA team is ready to accept for further testing. In Smoke Testing we test the major point's means major functionality of the application and it is also known by the name Build Acceptance Testing (BAT)

**Keep in Mind**

Please keep one thing in mind that firstly Smoke Testing is done by developer before releasing the build to the tester and when developers done the smoke testing than they releasing the build to the testing team and then testing team decide whether to accept the build or not for performing further testing by checking the major or you can say essential functionality of the build.

# Regression Testing

- Regression testing helps in validating the complete software after some portions of the software is modified due to bug fixes and changes to the specifications and enhancement of the functionality. Regression testing ensures that areas which were not directly modified have not been adversely or unexpectedly affected by the changes.

- The emphasis of regression testing is on performing tests not directly related to the areas being changed, to ensure they still perform as expected. Thus regression testing ensures that application is working as required after making changes to the code affected due to Bug fixing, Code changes functional enhancements.

# Acceptance Testing

The purpose of acceptance testing is for the users to verify the system or changes meet their original needs. The emphasis is on evaluating the system via normal business circumstances, but in a controlled testing environment.

Formal testing conducted to enable a user, customer, or other authorized entity to determine whether to accept a product or product component.

# Exploratory Testing

- As its name implies, exploratory testing is about exploring, finding out about the software, what it does, what it doesn't do, what works and what doesn't work. The tester is constantly making decisions about what to test next and where to spend the (limited) time. This is an approach that is most useful when there are no or poor specifications and when time is severely limited.

- Exploratory testing is a hands-on approach in which testers are involved in minimum planning and maximum test execution.

- Test logging is undertaken as test execution is performed, documenting the key aspects of what is tested, any defects found and any thoughts about possible further testing.

# Interoperability Testing

- Interoperability testing is to test the interfaces, particularly the external interfaces with the system. The emphasis is on verifying exchange of data, transmission and control, and processing times. External interface testing usually occurs as part of System Test.

- Interoperability Testing commences after completion of unit, functional, and integration testing, reported critical errors have been addressed, and updated version of the code is brought under configuration control.

# Installation or Production Testing

- Installation or Production Testing verifies whether the installed system performs as expected in the user's environment (if acceptance or pilot testing was not performed at the user location).

- This is the final check-out of the system prior to retiring the existing system (if one exists), and/or turning responsibility for the system over to the user organization or Maintenance and Operations (M&O) staff.

- The system is used for processing actual business using "live" data and the new/modified business processes.

# Pilot or Field Test Testing

- Pilot or field testing (as it is sometimes called) is an optional phase, but recommended whenever significant changes have been made or when a new system is deployed
- Need for pilot or field test (or several pilot/field tests) are warranted with an explicit, stated reason for conducting a pilot and a specific goal
- There are many types of Pilot or Field Testing, such as full or main product releases and earlier life cycle versions such as alphas, betas, as well as defect patches and minor upgrades, often referred to as point releases
- The primary emphasis is verification the system works in the actual user environment under real "live" business conditions.

# Alpha & Beta Testing

**Alpha testing :** In house virtual user environment can be created for this type of testing. Testing is done at the end of development. Still minor design changes may be made as a result of such testing.

**Beta testing :** Testing typically done by end-users or others. Final testing before releasing application for commercial purpose.

In a Product based company:

❖Alpha Testing defines as the testing which is done at the developer's site by the testers.

❖Beta testing is the testing done by the tester by generating the customer's environment.

In a Service based company:

❖Alpha testing is the testing conducted by customers at Developer's site.

❖Beta Testing is the process of giving the product to customers and let them do the testing at their environment

# Non-functional Testing

In non-functional testing the quality characteristics of the component or system is tested. Non-functional refers to aspects of the software that may not be related to a specific function or user action such as scalability or security.

**Example:**

– How does the application perform under normal circumstances?

– How the application behave when too many user logs in concurrently?

– Can the application handle stress?

– How secure is the application?

– Can the application recover from any disaster?

– Can the application behave in the same way in different environment or OS?

– How easy is to port the application in different system?

– Are the documents / user manual provided with the application easy to understand?

# Non functional Testing types

**Performance testing :**

To check whether system meets performance requirements. Used different performance and load tools to do this.

**Under Performance :**

**Load Testing** : Its a performance testing to check system behavior under load. ( E.G) Web Site

**Volume Testing :** Volume testing refers to testing a software application with a certain amount of data ( E.G) Data base size

**Stress Testing** : System is stressed beyond its specifications to check how and when it fails. ( E.G) complex database queries or load

# Non-Functional Testing Types

**Security testing :**

Can system be penetrated by any hacking way. Testing how well the system protects against unauthorized internal or external access.

Checked if system, database is safe from external attacks

1. User level security testing
2. System level security testing

` 3. Scenario level security testing

**Usability testing :**

User-friendliness check. Application flow is tested, Can new user understand the application easily, Proper help documented whenever user stuck at any point. Basically system navigation is checked in this testing.

# Non-Functional Testing Types

**Recovery testing:**

Evaluates that the application terminates gracefully in case of any failure and the data is recovered appropriately from any hardware and software failures.. The tests are not limited to the below points:

- Power interruption, to the client while doing CURD activities.
- Invalid database pointers and keys
- Database process are aborted or prematurely terminated.
- Database pointers, fields and keys are corrupted manually and directly within database.
- Physically disconnect the communication wires, power turn off, turn down the routers and network servers.

**Scalability testing :**

It is the testing of a software application for measuring its capability to scale up in terms of any of its non-functional capability like load supported, the number of transactions, the data volume etc.

# Change related Testing

- **Change related testing** is provided to ensure that previously eradicated bugs have been fixed and to catch bugs that may have been accidentally appeared into a new version

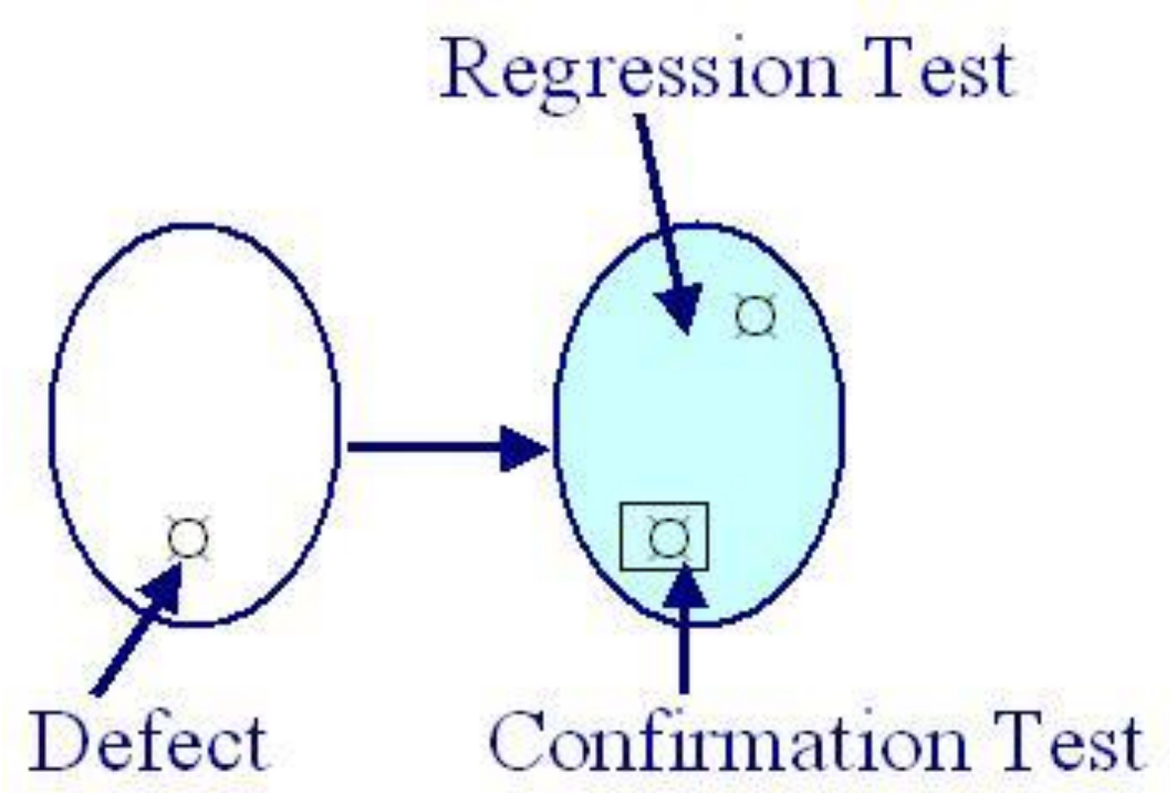
Two subtypes of Change related testing:

- Confirmation testing (Re-testing)
- Regression testing

- **Confirmation testing** to ensure the bug has indeed been successfully removed. Put it simply, the test case that originally detected the bug is executed again and this time it should pass with no problems.

- **Regression testing** consists not only of the detected bug test cases. It is performed not only for verifying bug fixing but also to ensure that new defects have not come up or discovered after the changes

# Change related Testing



# Types of Testing - Automation

**Automation testing :**

- Involves automating a manual process already in place that uses a formalized testing process.
- To control the execution of tests
- To compare the actual result and expected result outcome
- Having Test control and test reporting function
- Use Regression testing effectively

**Why Automate the Testing Process?**

✓ time-consuming manual test procedures.

✓ Increase the flexibility of time and resources

Automation tools : ( E.G) Win runner and QTP etc…

# Types of Testing

**Parallel testing :**

Testing a new or an alternate data processing system with the same source data that is used in another system. The other system is considered as the standard of comparison. The process of feeding test data into two systems, the modified system and an alternative system.

**End-to-end testing :**

Similar to system testing, involves testing of a complete application environment in a situation that mimics real-world use, such as interacting with a database, using network communications, or interacting with other hardware, applications, or systems if appropriate.

# Types of Testing

**Comparison testing :**

Comparison of product strengths and weaknesses with previous versions or other similar products **Context-driven testing :**

testing driven by an understanding of the environment, culture, and intended use of software. For example, the testing approach for life-critical medical equipment software would be completely different than that for a low-cost computer game.

**Mutation testing :**

A method for determining if a set of test data or test cases is useful, by deliberately introducing various code changes ('bugs') and retesting with the original test data/cases to determine if the 'bugs' are detected proper implementation requires large computational resources.

# Types of Testing

**Client Server Testing:**

The testing of Client / Server software occurs at three different levels: Client application testing isolation, Client software and associated Server application testing in concert and Complete Client / Server system testing including Network operation & Performance testing.

**Compatibility Testing**

Testing used to determine whether other system software components such as browsers, utilities, and competing software will conflict with the software being tested.

**Installation Testing**

Testing that determines if the product will able to install on a variety of platforms.

**Pilot Testing**

Testing that involves the users just before actual release to ensure that users become familiar with the release content .

( E.g) Beta Test

# Summary – Types of Testing

| Testing Type | Description |
|---|---|
| Exploratory Testing | Exploratory tests, unlike scripted tests, the skills and techniques very important for this testing approach . |
| Regression Test | Testing the application as a whole for the modification in any module |
| Alpha Test | The testing which is done at the developer's site by the testers |
| Beta Testing | The testing which is done at the client site by the end-user |

# Summary – Types of Testing

| Testing Type | Description |
|---|---|
| Performance Testing | Testing the System performance with different types testing methods |
| Automation Testing | Used for Regression testing effectively and increase the flexibility of time and resources, |
| End-to-end testing | Testing the application starting from scratch to the end after integration of all the modules. |
| Incremental integration testing | Bottom up approach for testing( i.e.) continuous testing of an application as new functionality is added and testing done. |

# Summary – Types of Testing

| Testing Type | Description |
|---|---|
| Smoke Test or Build verification test | When a build is received, a smoke test is run to ascertain if the build is stable and it can be considered for further testing. Smoke testing can be done for testing the stability of any interim build. Smoke testing can be executed for platform qualification tests.<br>Smoke testing can be done for testing the stability of any interim build. |
| Sanity testing | Once a new build is obtained with minor revisions, instead of doing a through regression, a sanity is performed so as to ascertain the build has indeed rectified the issues and no further issue has been introduced by the fixes |
| Exploratory Testing | when you have no idea of how the application works , exploring the application with intent of finding errors and using test charters. “ Testing while Exploring “ |

# Summary – Types of Testing

| Testing Type | Description |
|---|---|
| Functional Testing | This type of testing ignores the internal parts and focus on the output is as per requirement or not. Black-box type testing geared to functional requirements of an application |
| Recovery testing | Testing how well a system recovers from crashes, hardware failures, or other catastrophic problems. |
| Scalability testing | Scalability testing is to determine system behavior by increasing the load with a particular scaling ratio. For every scaling point all the performance attributes have to be determined. Also the factors affecting the application scaling capacity have to be determined. Following are the only few attributes out of many that considered during the scalability testing: Response Time, Throughput, Screen transition, Time {Session time, reboot time, printing time, transaction time, task execution time}. |