
# Testing Types & Levels in Testing

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# Smoke Testing

- Whenever a new build is provided by the development team then the software testing team validates the build and ensures that no major issue exists. The testing team ensures **that build is stable**, and a detailed level of testing is carried out further.

- Smoke testing is a subset of Acceptance testing

- Eg: a typical smoke test would be - Verify that the application launches successfully, Check that the GUI is responsive etc.

# Sanity Testing

- Sanity testing is a test execution which is done to touch each implementation and its impact but not thoroughly or in-depth, it may include functional, UI etc. testing depending on the implementation and its impact.
- Sanity Testing is done to **check the new functionality/bugs have been fixed**.
- Sanity testing is a subset of Regression Testing

# Regression Testing

- Testing an application as a whole for the modification in any module or functionality is termed as Regression Testing.

- Consider an application consisting of two modules. As part of the regression testing the tester needs to ensure that the **bug fixed in module 1 shouldn't introduce any new bugs in module 2 or any other functionality** of the module.

# Retesting

- After a defect is detected and fixed, the software should be retested to confirm that the original defect has been successfully removed.

- Suppose you were testing some software application and you found defects in some component.

  1. You log a defect in bug tracking tool.
  2. Developer will fix that defect and provide you with the official testable build.
  3. You need to re-run the failed test cases to make sure that the previous failures are gone.

# User Acceptance Testing

- An acceptance test is **performed by the client** and verifies whether the end to end flow of the system is **as per the business requirements** or not.

- It is typically of two types
  - Alpha phase – Test before releasing to prod
  - Beta phase – Test by few real users in prod(released only to those users)

- Developers may develop features based on their **own** understanding or Requirement changes **not communicated** effectively to developers

# Ad-hoc or Exploratory testing

- This testing is performed on an ad-hoc basis i.e. with no reference to test case and also **without any plan or documentation in place**.

- The objective of this testing is to **find the defects and break the application** by executing any flow of the application or any random functionality. In other words, explore the application with the intent of finding defects that exist in the application.

- Exploratory Testing is an informal testing performed by the testing team.

# Risk Based Testing

- In Risk Based Testing, the functionalities or requirements are tested based on their priority.

- Risk-based testing includes testing of highly critical functionality, which has the highest impact on business and in which the probability of failure is very high.

- The priority decision is based on the business need, so once priority is set for all functionalities then high priority functionality or test cases are executed first followed by medium and then low priority functionalities.

- Overview on Risk assessment matrix – Likelihood vs Impact

# Compatibility Testing

- It is a testing type in which it validates **how software behaves and runs in a different environment**, web servers, hardware, and network environment. Compatibility testing ensures that software can run on a different configuration, different database, different browsers and their versions.

- Consider an application running on Windows 7 operating systems without any issues. As part of compatibility testing the application also needs to be tested on other operating systems(which are in scope) to ensure no bugs are introduced on those platforms.

# What is a level of test?

- Defined by a given environment
- Environment is a collection of people, hardware, software, interfaces, data etc

| Attribute | Level | | | |
|---|---|---|---|---|
| | Unit | Integration | System | Acceptance |
| People | Developers | Developers & Testers | Testers | Testers & Users |
| Hardware O/S | Programmers' Workbench | Programmers' Workbench | System Test Machine or Region | Mirror of Production |
| Cohabiting Software | None | None | None/Actual | Actual |
| Interfaces | None | Internal | Simulated & Real | Simulated & Real |
| Source of Test Data | Manually Created | Manually Created | Production & Manually Created | Production |
| Volume of Test Data | Small | Small | Large | Large |
| Strategy | Unit | Groups of Units/Builds | Entire System | Simulated Production |

Fig 1 – Sample environment variables
[Systematic Software testing- Rick D. Craig and Stefan P. Jaskiel-2002]

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# Unit Testing

- Testing of an **individual software component or module** is termed as Unit Testing. It is typically done by the programmer and not by testers, as it requires a detailed knowledge of the internal program design and code.

- A simple example of unit testing could be as when the developer executes a function/method or a statement/loop to test if the program is working fine or not.

# Integration Testing

- Testing of all **integrated modules to verify the combined functionality after integration** is termed as Integration Testing.

- Modules are typically code modules, individual applications, client and server applications on a network.

  Eg: Ecommerce application, Linkedin

# System Testing

- System testing 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.

- During the process of manufacturing a ballpoint pen, the cap, the body, the tail, the ink cartridge and the ballpoint are produced separately, and unit tested separately. When two or more units are ready, they are assembled, and Integration Testing is performed. When the complete pen is integrated, System Testing is performed.

# Performance Testing

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

- The focus of Performance Testing is checking a software program's
  - Speed - Determines whether the application responds quickly
  - Scalability - Determines maximum user load the software application can handle.
  - Stability - Determines if the application is stable under varying loads

  Load Testing and Stress Testing

# Security Testing

- Security Testing is a variant of Software Testing which ensures, that system and applications in an organization, are free from any loopholes that may cause a big loss. It also aims at verifying 6 basic principles as listed below:

  - Confidentiality
  - Integrity
  - Authentication
  - Authorization
  - Availability
  - Non-repudiation

Objective: To uncover vulnerabilities and determine software and data are protected

# Installation Testing

- Installation testing is check that software application is successfully installed & it is working as expected after installation.

- Example of Installation testing would be testing the installation of the application in different modes. It can be
  - exe installation,
  - msi installation,
  - msi-silent mode of installation,
  - msi-command line installation or a
  - batch file installation.
  - Remote Deployment

# References


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# Q & A

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