Software Testing

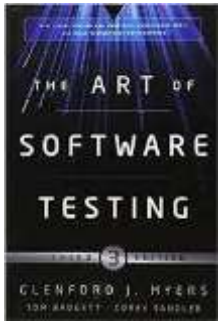
Fundamentals

Topics Covered

- Definition of Testing
- Verification Vs Validation
- Testing Types
- Testing Approaches
- Levels of Testing

What is Testing?

- "Testing is the process of executing a program with the intention of finding errors." – Myers

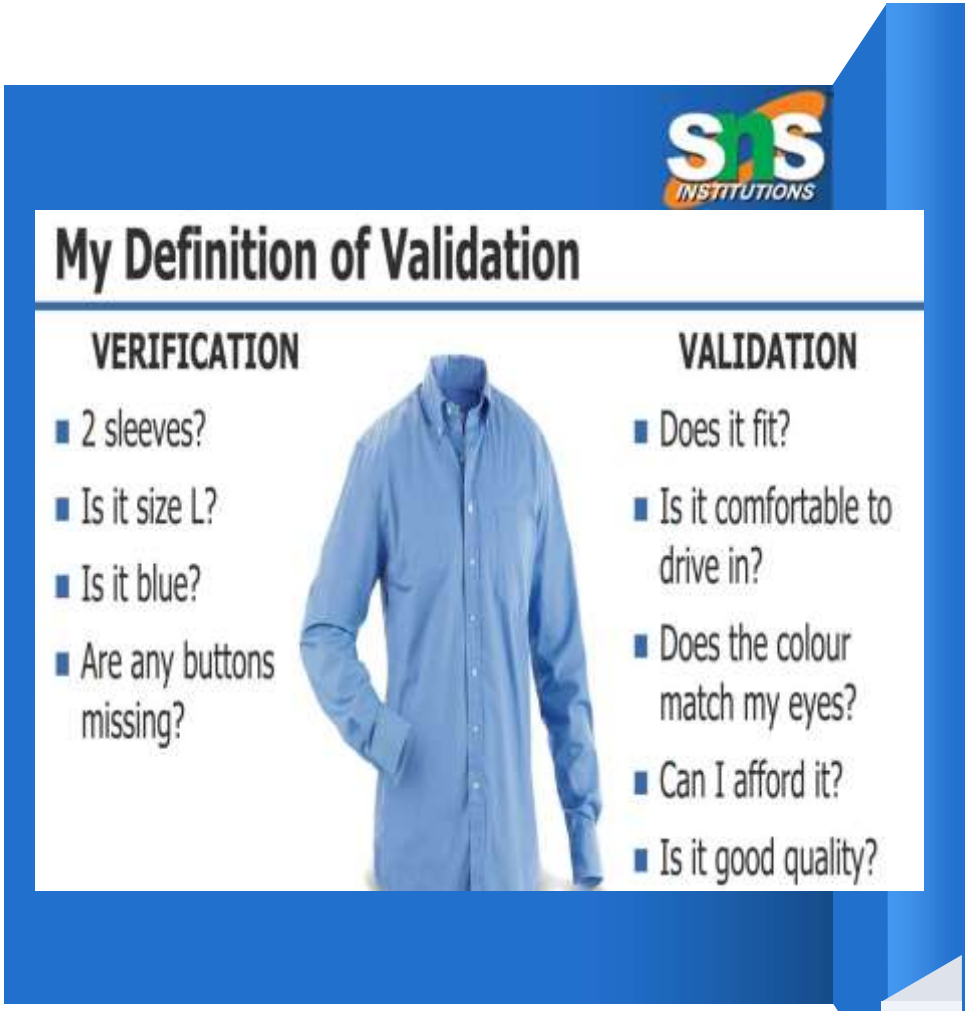


- "Testing can show the presence of bugs but never their absence." - Dijkstra

Strategic Approach

- To perform effective testing, you should conduct effective technical reviews. By doing this, many errors will be eliminated before testing commences.
- Testing begins at the component level and works "outward" toward the integration of the entire computer-based system.
- Different testing techniques are appropriate for different software engineering approaches and at different points in time.
- Testing is conducted by the developer of the software and (for large projects) an independent test group.
- Testing and debugging are different activities, but debugging must be accommodated in any testing strategy. am

- *Verification* **(Static Testing)** refers to the set of tasks that ensure that software correctly implements a specific funct ion.
- *Validation* **(Dynamic Testing)** refers to a different set of tasks that ensure that the software that has been built is traceable to customer requirements.
- Boehm [Boe81] states as:
  - *Verification:* "Are we building the product right?"
  - *Validation:* "Are we building the right product?"



Verification Vs Validation

Verification	Validation
Are we implementing the system right?	Are we implementing the right system?
Evaluating products of a development phase	Evaluating products at the closing of the development process
The objective is making sure the product is as per the requirements and design specifications	The objective is making sure that the product meets user's requirements
Activities included: reviews, meetings, and inspections	Activities included: black box testing, white box testing, and grey box testing
Verifies that outputs are according to inputs or not	Validates that the users accept the software or not
Items evaluated: plans, requirement specifications, design specifications, code, and test cases	Items evaluated: actual product or software under test
Manual checking of the documents and files	Checking the developed products using the documents and files

Who Tests the Software?

Developer

Understands the system

but, will test "gently"

Independent tester

Must learn about the system,

but, will attempt to break it

Testing Types

Manual Testing:

- Test cases are executed manually (by a human, that is) without any support from tools or scripts.
- Not Accurate(Due to change of Human errors)
- Time Consuming

Automation Testing:

- Automation testing is the process of testing the software using an automation tool to find the defects.
- Faster and Reliable
- Investment for tools

Testing Approaches

There are three types of software testing approaches.

1. White Box Testing
2. Black Box Testing
3. Grey Box Testing

Testing Approaches

Black Box Testing:

- It is also called as Behavioral/Specification-Based/Input-Output Testing.
- Black Box Testing is a software testing method in which testers evaluate the functionality of the software under test without looking at the internal code structure.

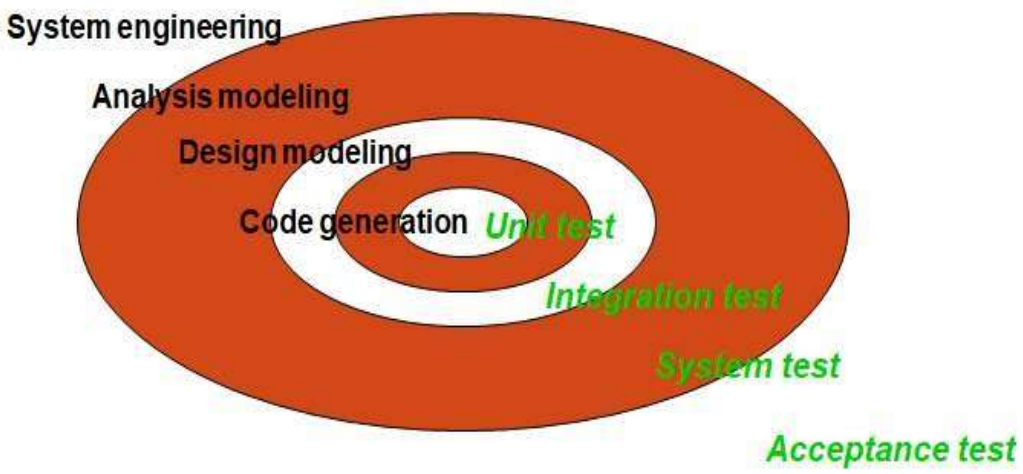
White Box Testing:

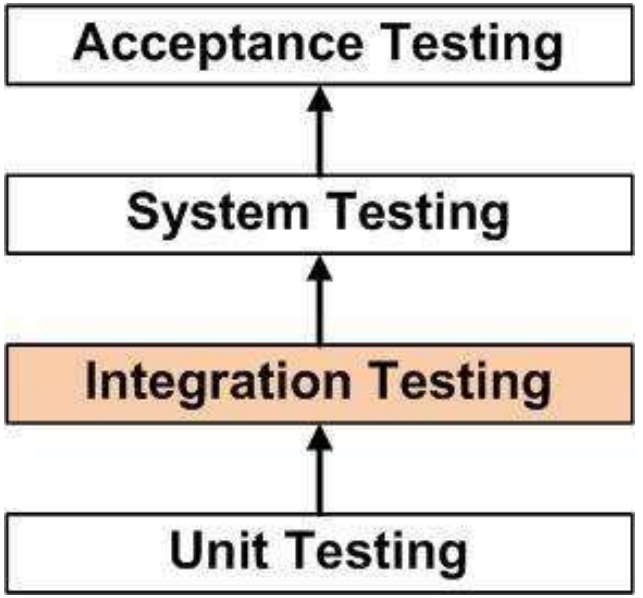
- It is also called as Glass Box, Clear Box, Structural Testing.
- In white-box testing, an internal perspective of the system, as well as programming skills, are used to design test cases.
- This testing is usually done at the unit level.

Grey Box Testing:

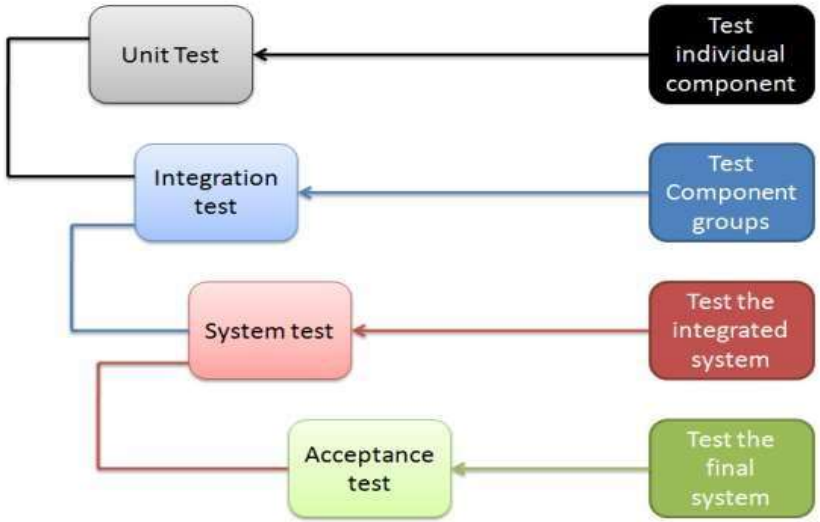
- Grey box is the combination of both White Box and Black Box Testing.

Levels of Testing





Levels of Testing



Unit Testing	Done by Developers
Integration Testing	Done by Testers
System Testing	Done by Testers
Acceptance Testing	Done by End Users

Test for U !!!!!

Sl.No	A	B	Match Results
1	Unit Testing	Dynamic Testing	
2	White Box Testing	Faster & Reliable	
3	Verification	Components	
4	Validation	Internal Logic	**2**
5	Automation Testing	Behavioural Testing	
6	Black Box Testing	Building the product right	

Thanks!

Any questions?

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