Test levels

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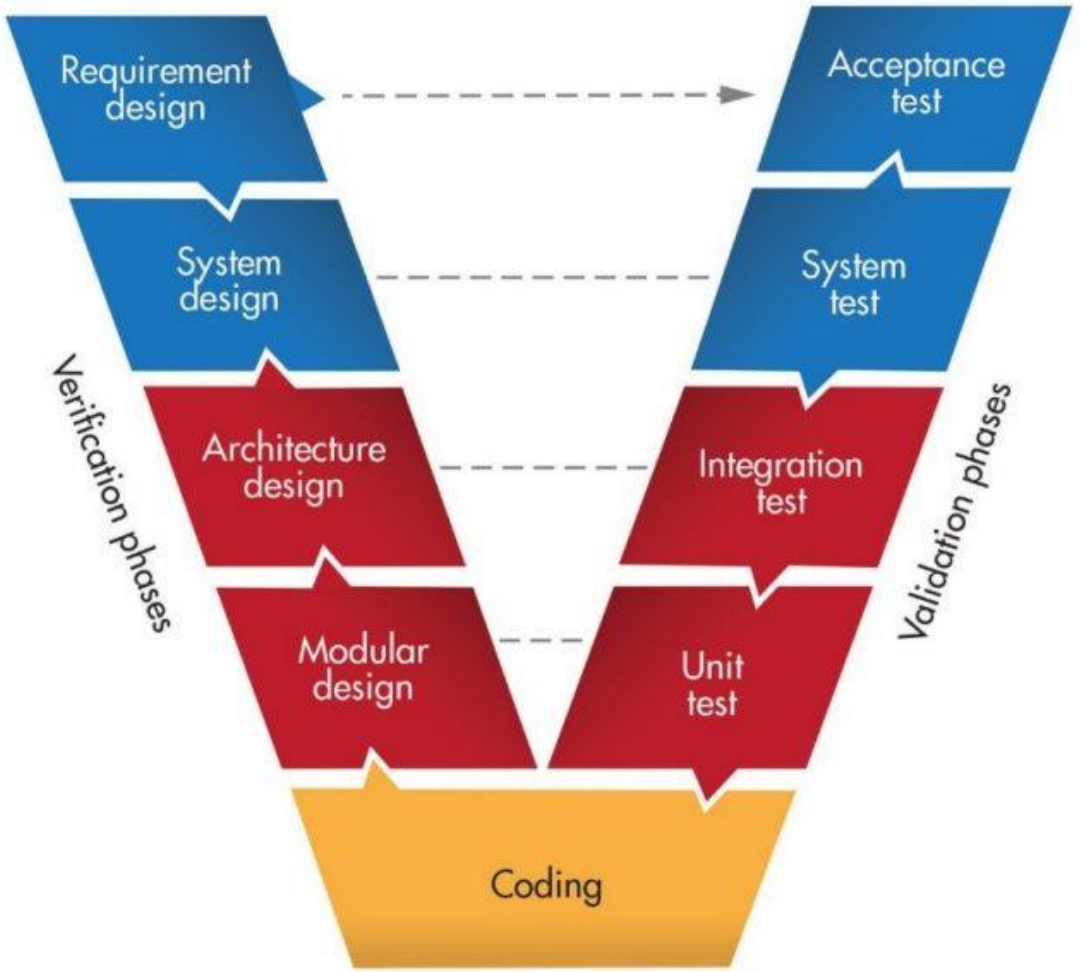
Agenda

1. What is Test levels
2. Why Test levels
3. Four levels of testing
4. Software testing objectives
5. Questions

Recall - V-model



What is Test levels?

- Test levels are groups of test activities that are organized and managed together
- For each test level, a suitable test environment is required.

Why test levels?

Each test level has a specific purpose

Test levels provide value to the software development lifecycle.

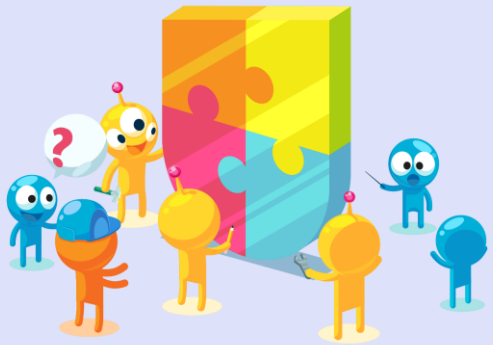
Four levels of testing

Component/unit test	• Test individual component
Integration test	• Test integrated Components
System test	• Test the entire system
Acceptance test	• Test the final system

Component testing

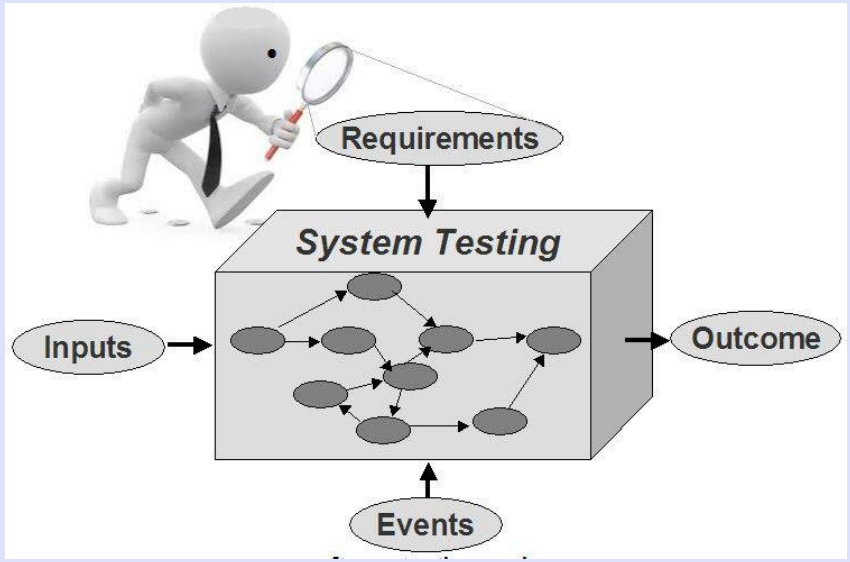
A Unit (Component)	is the smallest testable portion of a system or application
Component testing	helps to test each module (unit) separately.
Purpose	to validate that each unit of the software performs as designed.
Performed	by developers

Integration testing



Integration testing	focuses on interactions, interfaces between components or systems	Checks the data flow from one module to other modules.
Purpose	to detect interaction errors that occur between Units	
Performed	by testers.	

System testing



System testing is performed on a complete, integrated system

Focuses on the behavior and capabilities of a whole system or product (end-to-end tasks) It tests the overall interaction of components

Performed by testers.

Acceptance testing

- Typically focuses on the behavior and capabilities of a whole system or product.
- Establishing confidence in the quality of the system as a whole
- Validating that the system is complete and will work as expected
- Verifying that functional and non-functional behaviors of the system are as specified

Two types of Acceptance testing

Internal Acceptance Testing

- Known as Alpha Testing
- Is performed by members of the organization that developed the software

External Acceptance Testing

- Known as Beta Testing
- Is performed by people who are not employees of the organization.

Software Testing Objectives

PREVENT DEFECTS

Efficient testing helps preventing defects and that helps in providing an error-free application.

EVALUATE WORK PRODUCTS

To evaluate work products such as requirements, user stories, design, and code

FIND FAILURE AND DEFECTS

To find failures and defects. Defects should be identified as early in the test cycle as possible..

VERIFY REQUIREMENT

To verify whether all specified requirements have been fulfilled

SHARE INFORMATION TO STAKEHOLDERS

To provide enough information to stakeholders to allow them to make informed decisions, especially regarding the level of quality of the test object

VALIDATE TEST OBJECT

To validate whether the test object is complete and works as the users and other stakeholders expect

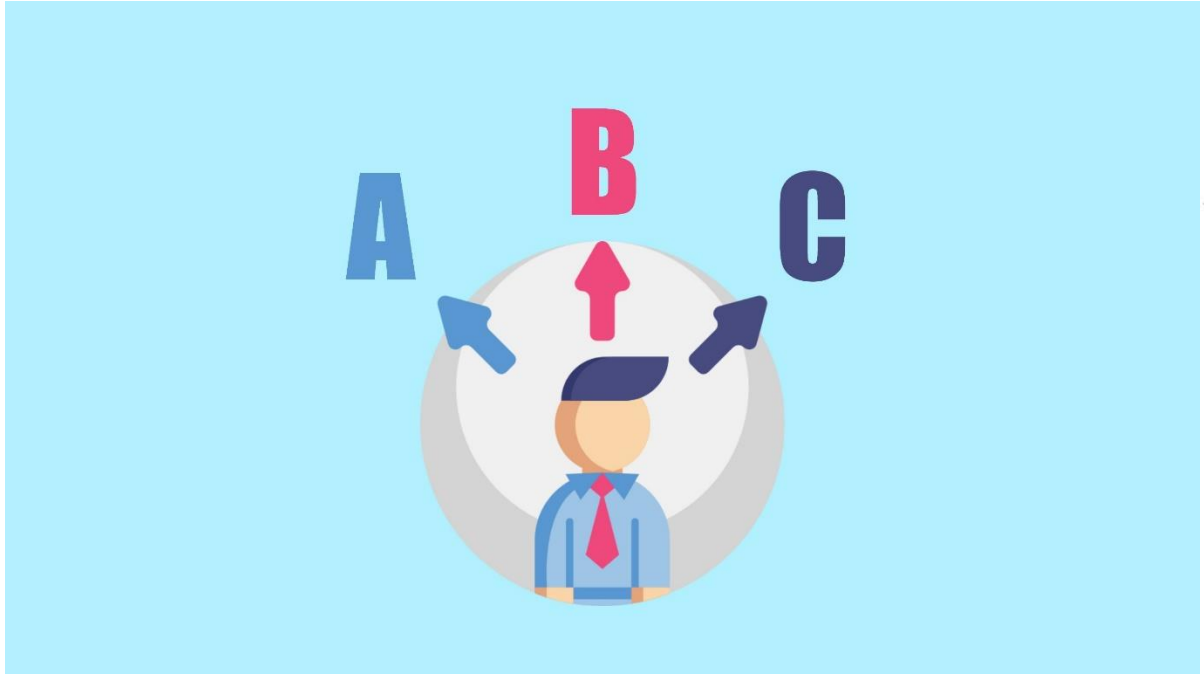
REDUCE RISK

To reduce the level of risk of inadequate software quality (e.g., previously undetected failures occurring in operation)

BUILD CONFIDENCE

To build confidence in the level of quality of the test object

Questions



Question 1

Given that the testing being performed has the following attributes:

- Based on interface specifications
- Focused on finding failures in communication
- The test approach uses both functional and structural test types

Which of the following test levels is MOST likely being performed?

a) Integration testing
b) Acceptance testing
c) System testing
d) Component testing

Question 2

Programmers often write and execute unit tests against code which they have written. During this self-testing activity, which of the following is a tester mindset that programmers should adopt to perform this unit testing effectively?

a) Good communication skills
b) Code coverage
c) Evaluating code defects
d) Attention to detail

Question 3

You are running a performance test with the objective of finding possible network bottlenecks in interfaces between components of a system.

Which of the following statements describes this test?

a) A functional test during the integration test level

b) A non-functional test during the integration test level

c) A functional test during the component test level

d) A non-functional test during the component test level

Question 4 - homework

Which of the following statements comparing component testing and system testing is TRUE?

a) Component testing verifies the functionality of software modules, program objects, and classes that are separately testable, whereas system testing verifies interfaces between components and interactions between different parts of the system

b) Test cases for component testing are usually derived from component specifications, design specifications, or data models, whereas test cases for system testing are usually derived from requirement specifications or use cases

c) Component testing only focuses on functional characteristics, whereas system testing focuses on functional and non-functional characteristics

d) Component testing is the responsibility of the testers, whereas system testing typically is the responsibility of the users of the system

Question 5 - homework

Which of the following statements about test types and test levels is CORRECT?

a) Functional and non-functional testing can be performed at system and acceptance test levels, while white-box testing is restricted to component and integration testing

b) Functional testing can be performed at any test level, while white-box testing is restricted to component testing

c) It is possible to perform functional, non-functional and white-box testing at any test level

d) Functional and non-functional testing can be performed at any test level, while white-box testing is restricted to component and integration testing

Question 6 - homework

Consider the following types of defects that a test level might focus on:

1. Defects in separately testable modules or objects
2. Not focused on identifying defects
3. Defects in interfaces and interactions
4. Defects in the whole test object

Which of the following list correctly matches test levels from the Foundation syllabus with the defect focus options given above?

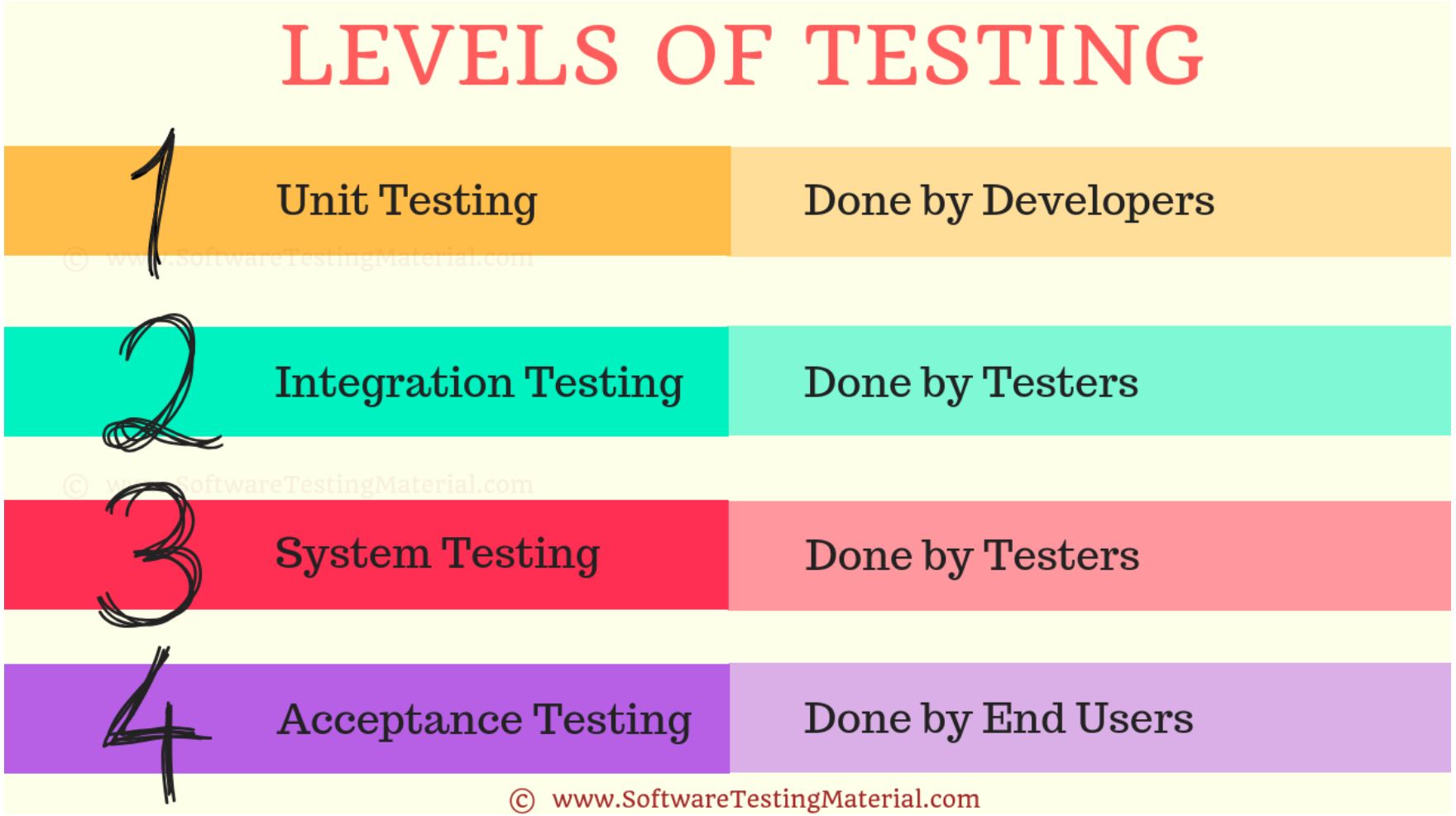
a) 1 = performance test; 2 = component test; 3 = system test; 4 = acceptance test

b) 1 = component test; 2 = acceptance test; 3 = system test; 4 = integration test

c) 1 = component test; 2 = acceptance test; 3 = integration test; 4 = system test

d) 1 = integration test; 2 = system test; 3 = component test; 4 = acceptance test

Summary


LEVELS OF TESTING
1
Unit Testing
Done by Developers
2
Integration Testing
Done by Testers
3
System Testing
Done by Testers
4
Acceptance Testing
Done by End Users
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Reference

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Q & A

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