

SOFTWARE TESTING

CO3015 / CO5252

CH1. INTRODUCTION

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Content

- ▶ The role and the importance of software testing
- ▶ Testing levels
- ▶ Testcases
- ▶ Basic principles of software testing
- ▶ Testing process and plan
- ▶ Test automation

Why do we test software?

**Introduction to Software
Testing
(2nd edition)
Chapter 1**

Why Do We Test Software?

Paul Ammann & Jeff Offutt

<http://www.cs.gmu.edu/~offutt/softwaretest/>

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First version, 28 August 2011*

What is software testing?

► <https://www.guru99.com/software-testing-introduction-importance.html>

Software Testing is a method to check whether the actual software product matches expected requirements and to ensure that software product is defect free. It involves execution of software/system components using manual or automated tools to evaluate one or more properties of interest. The purpose of software testing is to identify errors, gaps or missing requirements in contrast to actual

[1]

Testing is the process of executing a program with the intent of finding errors.

What is software testing?

► <https://www.guru99.com/software-testing-introduction-importance.html>

PROGRAM TESTING GOALS

- ✓ To demonstrate to the developer and the customer that the software meets its requirements.
 - validation testing

- ✓ To discover situations in which the behavior of the software is incorrect, undesirable or does not conform to its specification.
 - defect testing

The role and the importance of software testing

► <https://www.testbytes.net/blog/role-of-software-testing-in-software-development/>

The role of testing in software development begins with **improved reliability, quality and performance of the software**. It assists a developer to check out whether the software is performing the right way and to assure that software is not performing what it is not supposed to do.

Testcases

- ▶ https://en.wikipedia.org/wiki/Test_case

A test case is a **specification of the inputs, execution conditions, testing procedure, and expected results that define a single test** to be executed to achieve a particular software testing objective, such as to exercise a particular program path or to verify compliance with a specific requirement

Testcases vs. test scenario

► <https://www.guru99.com/test-case-vs-test-scenario.html>

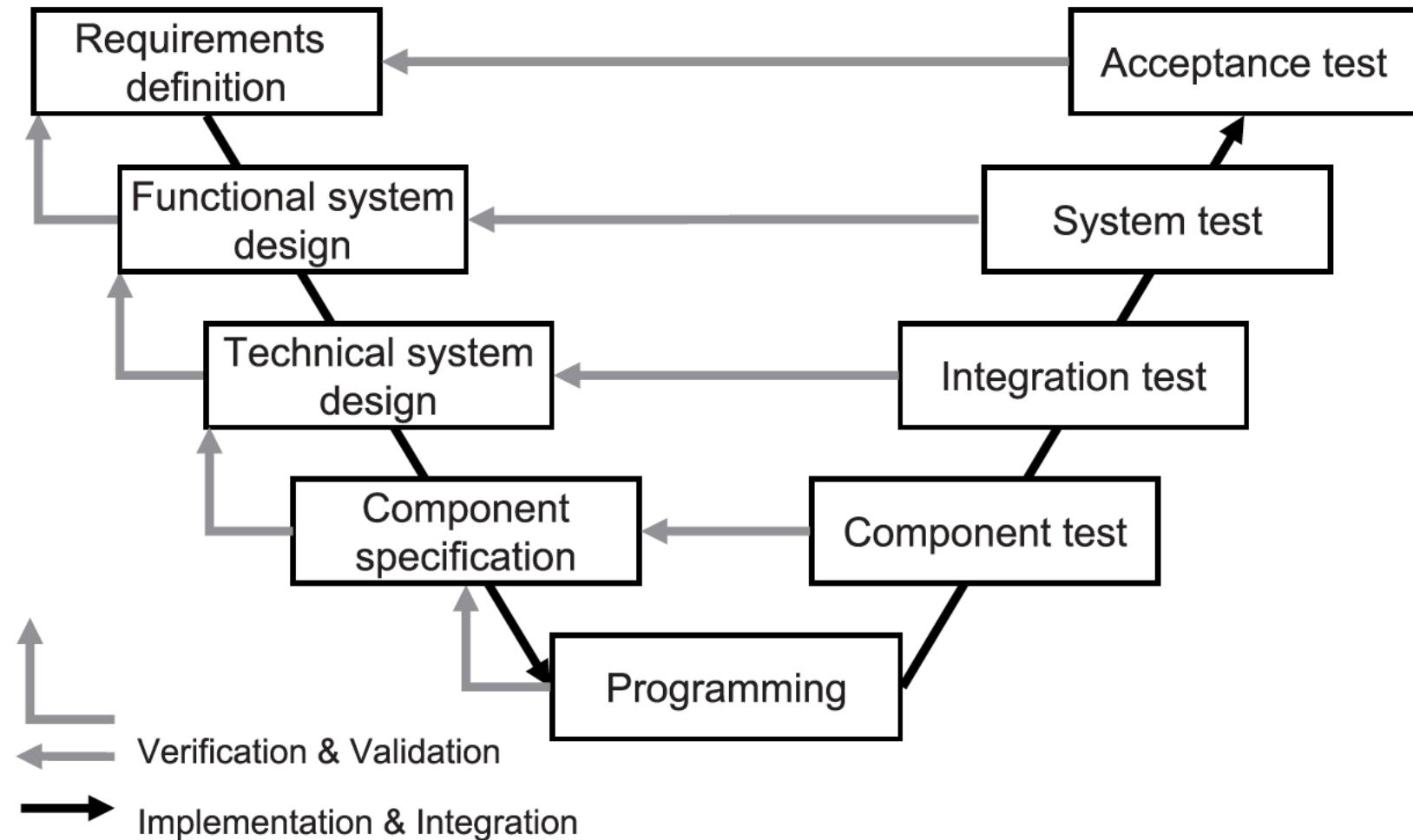
A TEST CASE is a set of actions executed to verify a particular feature or functionality of your software application. A Test Case contains test steps, test data, precondition, postcondition developed for specific test scenario to verify any requirement. The test case includes specific variables or conditions, using which a testing engineer can compare expected and actual results to determine whether a software product is functioning as per the requirements of the customer.

A **Test Scenario** is defined as any functionality that can be tested. It is a **collective set of test cases** which helps the testing team to determine the positive and negative characteristics of the project.

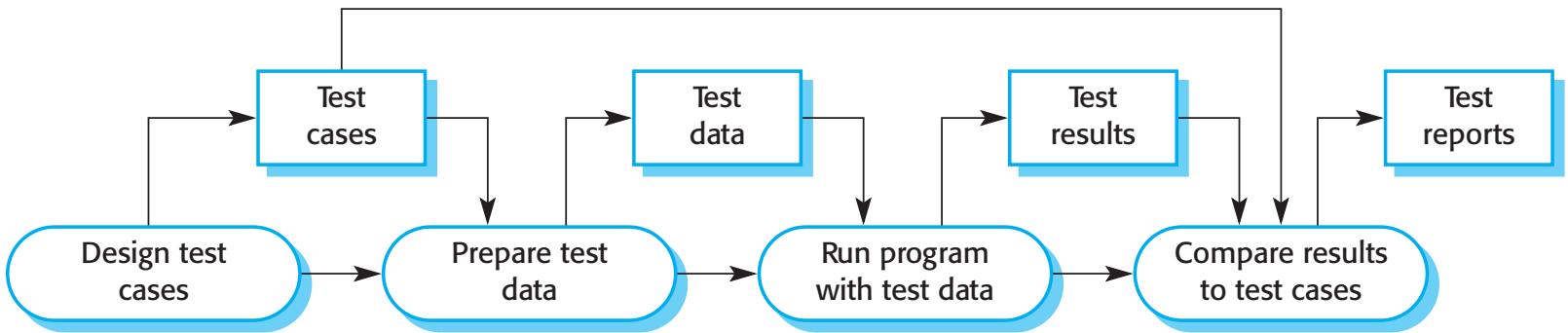
Basic principles of software testing [2]

- ▶ Principle 1: Testing shows the presence of defects, not their absence.
- ▶ Principle 2: Exhaustive testing is impossible.
- ▶ Principle 3: Testing activities should start as early as possible.
- ▶ Principle 4: Defect clustering.
- ▶ Principle 5: The pesticide paradox.
- ▶ Principle 6: Testing is context dependent.
- ▶ Principle 7: No failures means the system is useful is a fallacy.

Testing process – The general V-model [2]

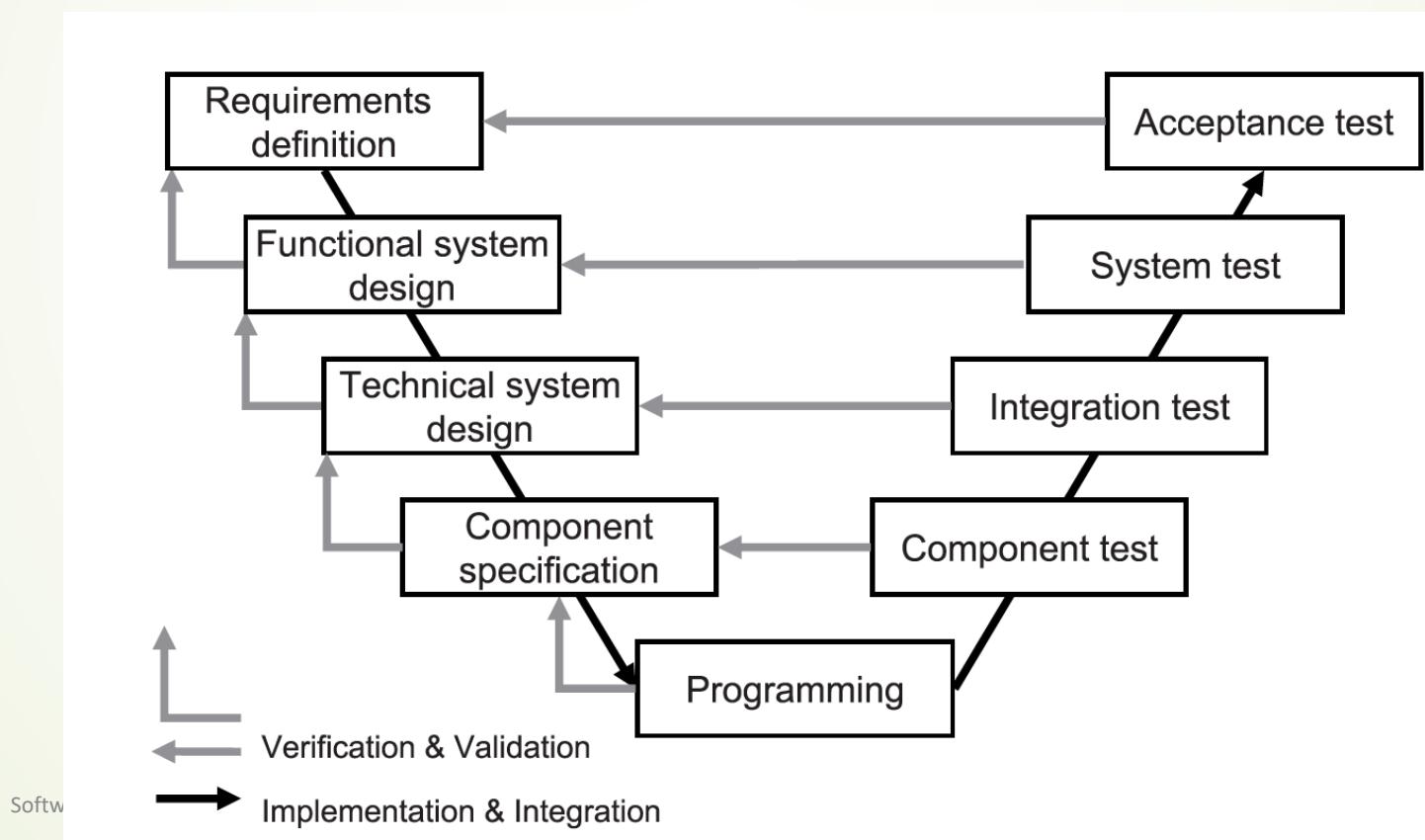


A MODEL OF THE SOFTWARE TESTING PROCESS



Testing levels

► <https://www.seguetech.com/the-four-levels-of-software-testing/>



“Testing purpose” levels

Testing Goals Based on Test Process Maturity

- Level 0 : There's no difference between testing and debugging
- Level 1 :The purpose of testing is to show correctness
- Level 2 :The purpose of testing is to show that the software doesn't work
- Level 3 :The purpose of testing is not to prove anything specific, but to reduce the risk of using the software
- Level 4 :Testing is a mental discipline that helps all IT professionals develop higher quality software

Test plan

► <https://www.guru99.com/what-everybody-ought-to-know-about-test-planing.html>

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Test Automation

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Summary

- ▶ Software testing is important
- ▶ What is software testing vs. testing purposes/goals
 - ▶ Satisfy the requirements vs. finding defects
- ▶ Testing levels
 - ▶ Unit/Component -> Integration -> System -> Acceptance
- ▶ Testcases
- ▶ Basic principles of software testing
 - ▶ 7 principles
- ▶ Testing process and plan
 - ▶ The V-model
 - ▶ The plan
- ▶ Test automation