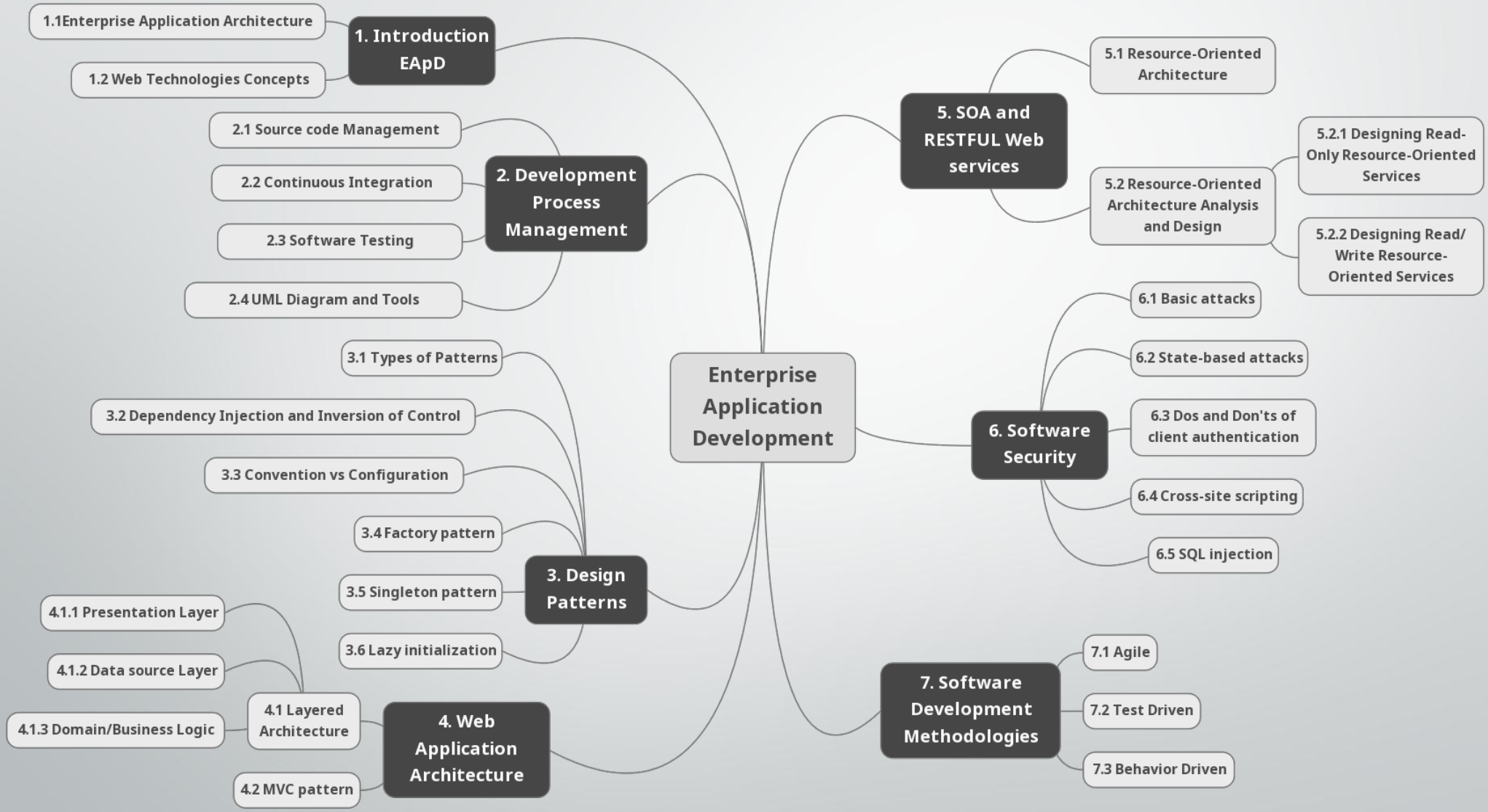
Enterprise Application Development

[BE SE-7th Semester]

Nepal College of Information Technology

POKHARA UNIVERSITY

Enterprise Application Development



2.3 Software Testing

1. Software Testing Fundamentals
2. Test Cases and Levels of Testing
3. Different Types of Testing
4. Security testing, Black box and white box testing

Software Testing

- Testing is an essential part of software development process.
- Testing is used to identify the correctness, completeness and quality of developed software.
- Testing is the process of executing a program or application with the intent of finding the software bugs.
- It can be stated as the process of validating and verifying software.
- *Software Testing is the process of evaluating the system or its components with the intent to find errors whether it satisfies the specified requirements or not It is the process of executing a system in order to identify gaps, errors or missing requirements in contrary to the actual desire or requirements.*

Software Testing Objectives

- To ensure that customer will be able to get his/her work done
- To find defects that may be created by the programmer while developing the software.
- To gain confidence in and providing information about the level of quality.
- To prevent defect.
- To make sure that the end result meets the business and user requirements
- To gain confidence of the customer by providing them a quality product.
- To find and remove errors that lead to software failure.

Software Testing Life cycle

- Software Testing Life Cycle (STLC) is the testing process which is executed in systematic and planned manner.
- In STLC process, different activities are carried out to improve the quality of the product.

  [Requirement Analysis → Test Planning → Test Case Development → Environment Setup → Test Execution → Test Cycle Closure]

- Ideally, the next step is based on previous step or we can say next step cannot be started unless and until previous step is completed.
- It is possible in the ideal situation, but practically it is not always true.

Test Cases

- We now know, test cases are **integral part of testing**.
- So we need to know more about test cases and how these test cases are designed.
- The most desired or obvious expectation from a test case is that it should be able to find most errors with the least amount of time and effort.
- Test cases are a set of conditions or variable under which a tester will determine whether a system under test satisfies requirements or works correctly.

Writing Good Test Cases

- Write test cases in such a way that you test only one thing at a time. Do not overlap or complicate test cases.
- Attempt to make test cases —atomic
- Ensure all positive and negative scenarios are covered.
- Writing in simple and easy to understand.
- Use active voice: Do this, Do that.
- Use exact and consistent names (of fields, forms, etc.).

STLC → Test Case Example

Test Scenario ID	Login-1	Test Case ID	Login-1B
Test Case Description	Login – Negative test case	Test Priority	High
Pre-Requisite	NA	Post-Requisite	NA

Test Execution Steps:

S.No	Action	Inputs	Expected Output	Actual Output	Test Browser	Test Result	Test Comments
1	Launch application	https://www.facebook.com/	Facebook home	Facebook home	IE-11	Pass	[Priya 10/17/2017 11:44 AM]: Launch successful
2	Enter invalid Email & any Password and hit login button	Email id : invalid@xyz.com Password: ******	The email address or phone number that you've entered doesn't match any account. Sign up for an account.	The email address or phone number that you've entered doesn't match any account. Sign up for an account.	IE-11	Pass	[Priya 10/17/2017 11:45 AM]: Invalid login attempt stopped
3	Enter valid Email & incorrect Password and hit login button	Email id : valid@xyz.com Password: ******	The password that you've entered is incorrect. Forgotten password?	The password that you've entered is incorrect. Forgotten password ?	IE-11	Pass	[Priya 10/17/2017 11:46 AM]: Invalid login attempt stopped

Characteristics of good test case

1) Accurate: Exacts the purpose.
2) Economical: No unnecessary steps or words.
3) Traceable: Capable of being traced to requirements.
4) Repeatable: Can be used to perform the test over and over.
5) Reusable: Can be reused if necessary.

Levels of testing

Unit testing

- To test each module (unit, or component) independently
- Mostly done by developers of the modules

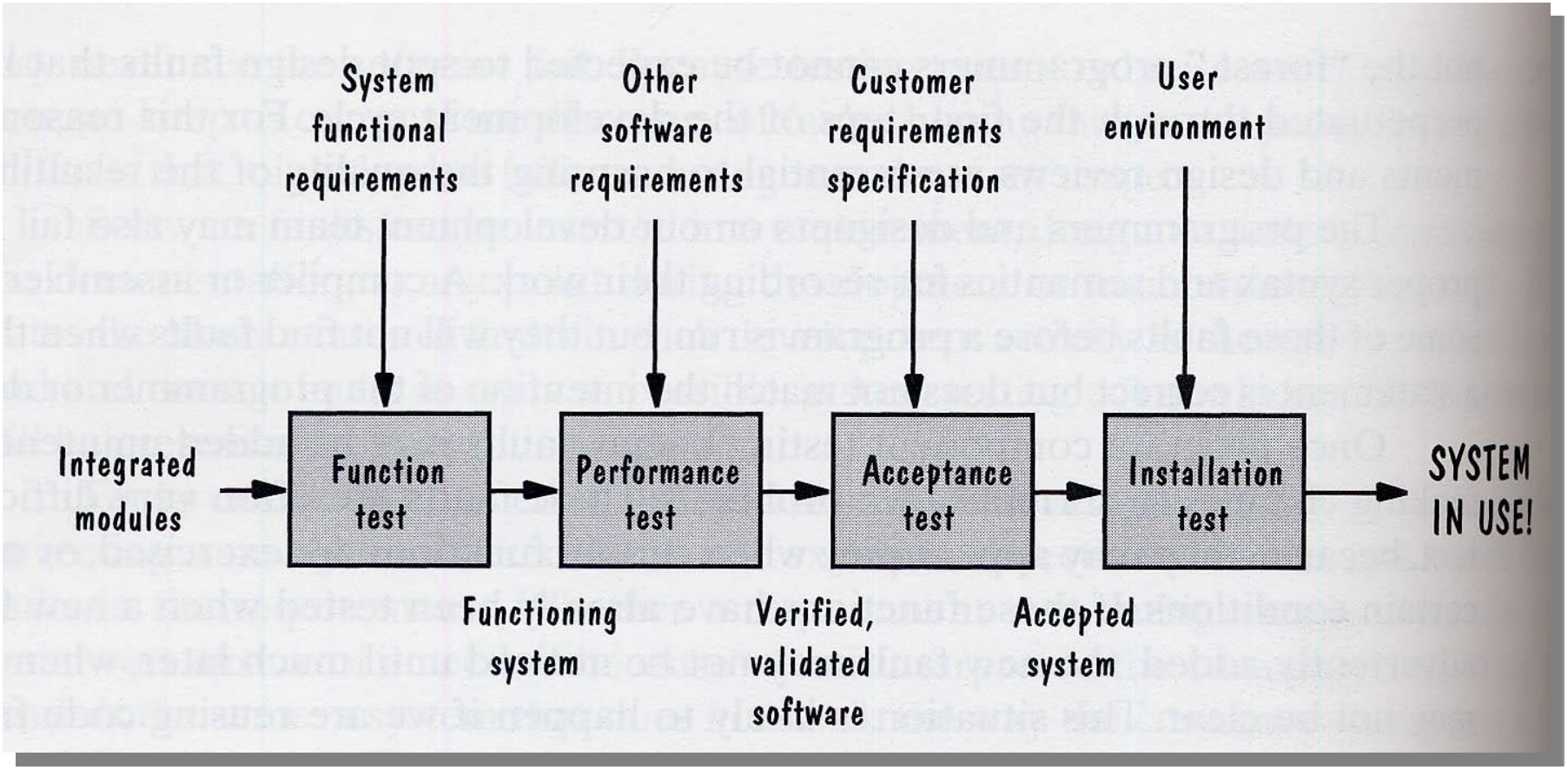
Integration and system testing

- To test the system as a whole
- Often done by separate testing or QA team

Acceptance testing

- To validate system functions for (and by) customers or user

System testing



11- steps of testing process

- Step 1: Assess Development Plan and Status
- Step 2: Develop the Test Plan
- Step 3: Test Software Requirements
- Step 4: Test Software Design
- Step 5: Program (Build) Phase Testing
- Step 6: Execute and Record Results
- Step 7: Acceptance Test
- Step 8: Report Test Results
- Step 9: The Software Installation
- Step 10: Test Software Changes
- Step 11: Evaluate Test Effectiveness

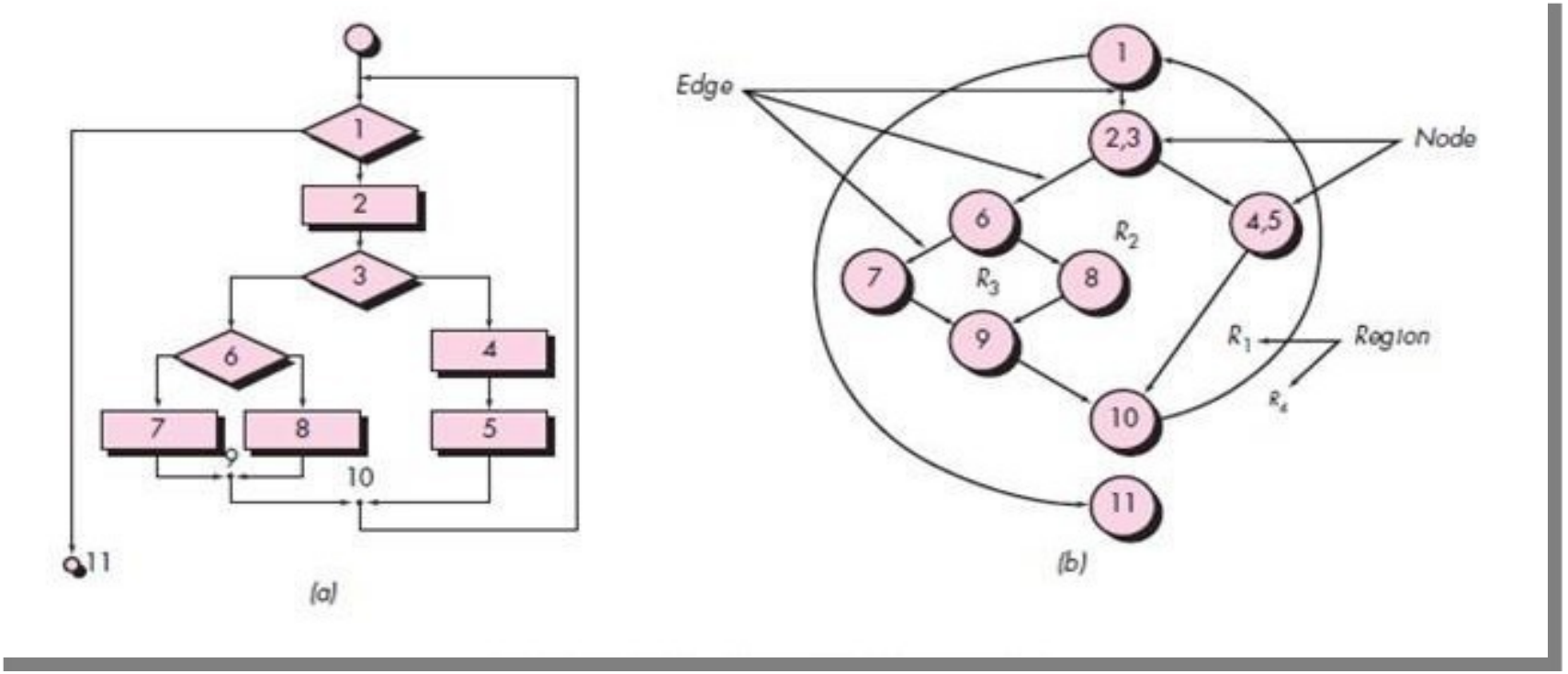
Different Types of Testing

- Installation Testing
- Usability Testing
- Regression Testing
- Performance Testing
- Load Testing
- Stress Testing
- Security Testing

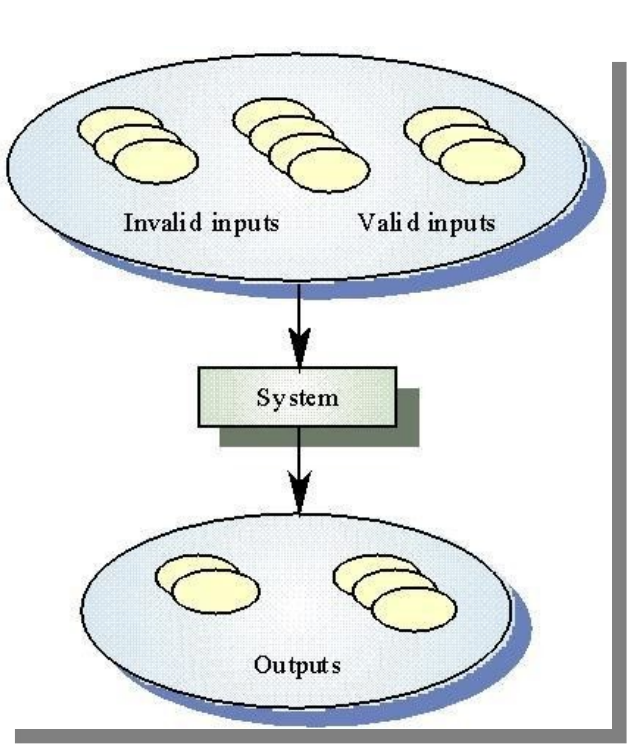
Why Security Testing?

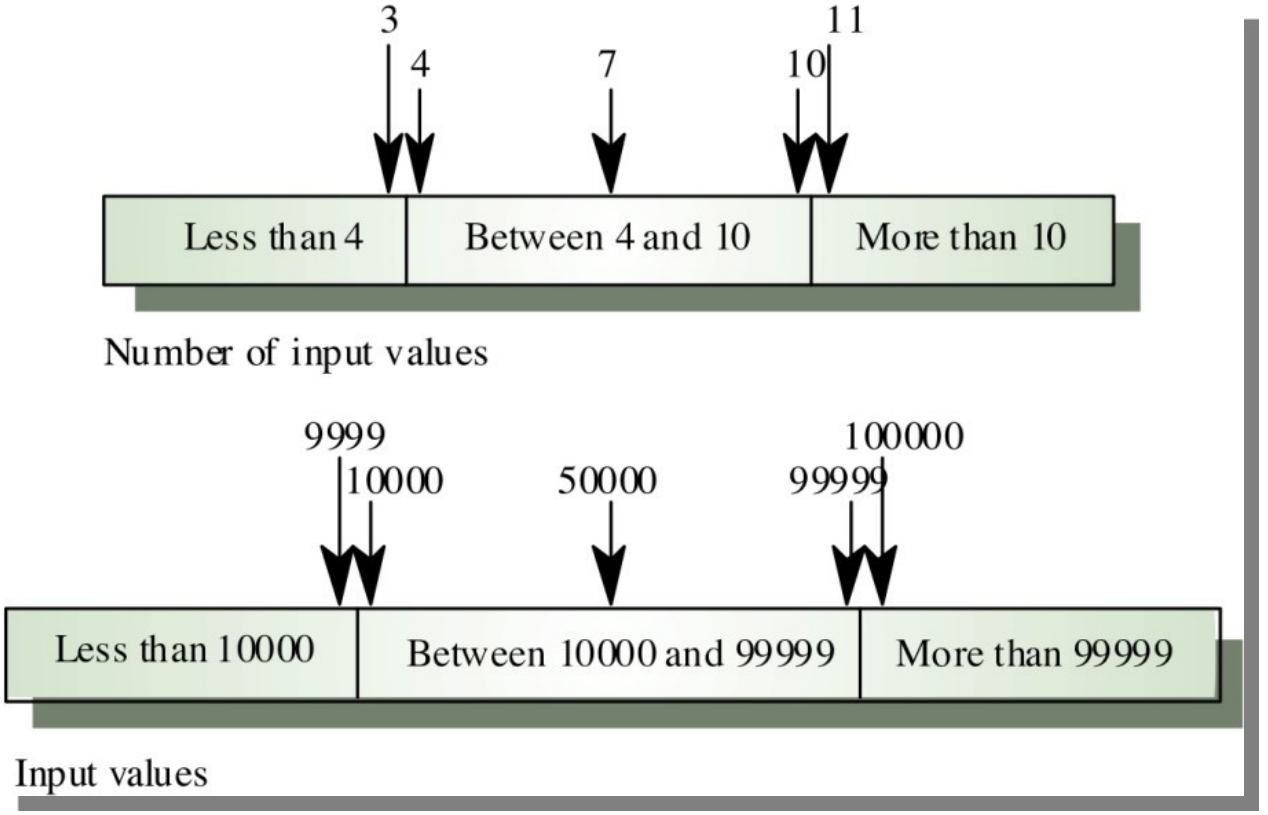
- For Finding Loopholes
- For identifying Design Insecurities
- For identifying Implementation Insecurities
- For identifying Dependency Insecurities and Failures
- For Information Security
- For Process Security
- For Internet Technology Security
- For Communication Security
- For Improving the System
- For confirming Security Policies
- For Organization wide Software Security
- For Physical Security

Flow graph notation



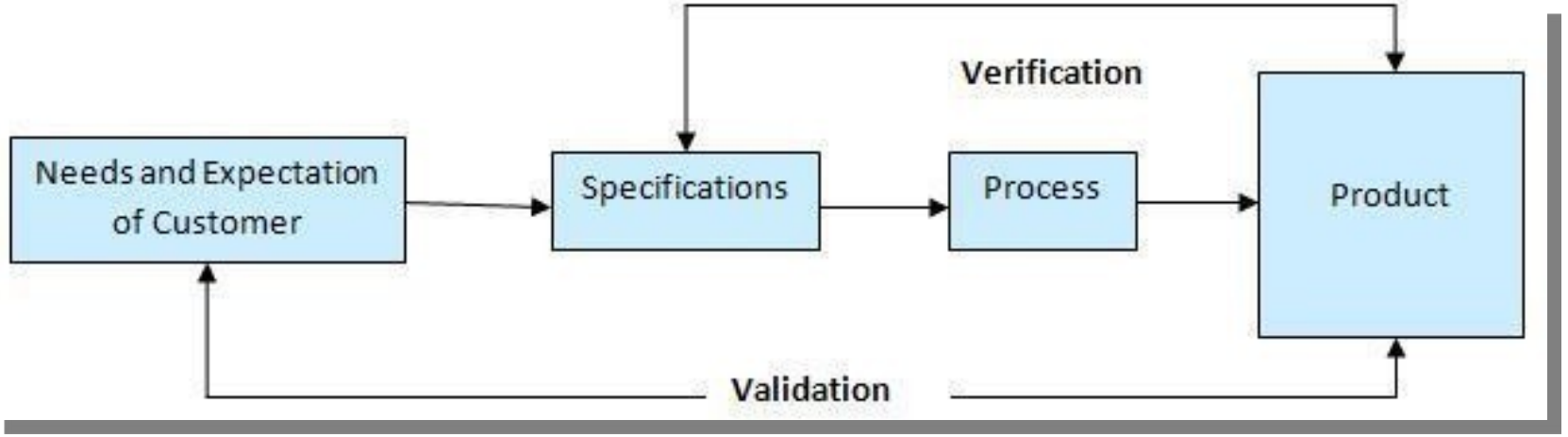
Equivalence Partitioning





Validation Testing

- Its goal is to validate and be confident about the product or system, and that it fulfills the requirements given by the customer.
- The acceptance of the software from the end customer is also its part. Often, testing activities are introduced early in the software development life cycle.



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