

4. Software Testing Life-Cycle. Testing plan

Why is testing not a single
activity?

Questions

- What are the phases in software development life-cycle?
- What is end-to-end testing?
- What are the scrum roles?
- What are the scrum artefacts?
- What is sprint in scrum?
- What are the questions in daily standup that every team member should answer?

Software testing life cycle (STLC)

- **STLC refers to a testing process which has specific steps to be executed in a definite sequence to ensure that the quality goals have been met.**
- In STLC process, each activity is carried out in a planned and systematic way.
- Each phase has different goals and deliverables.

Stages of STLC

Requirement Analysis

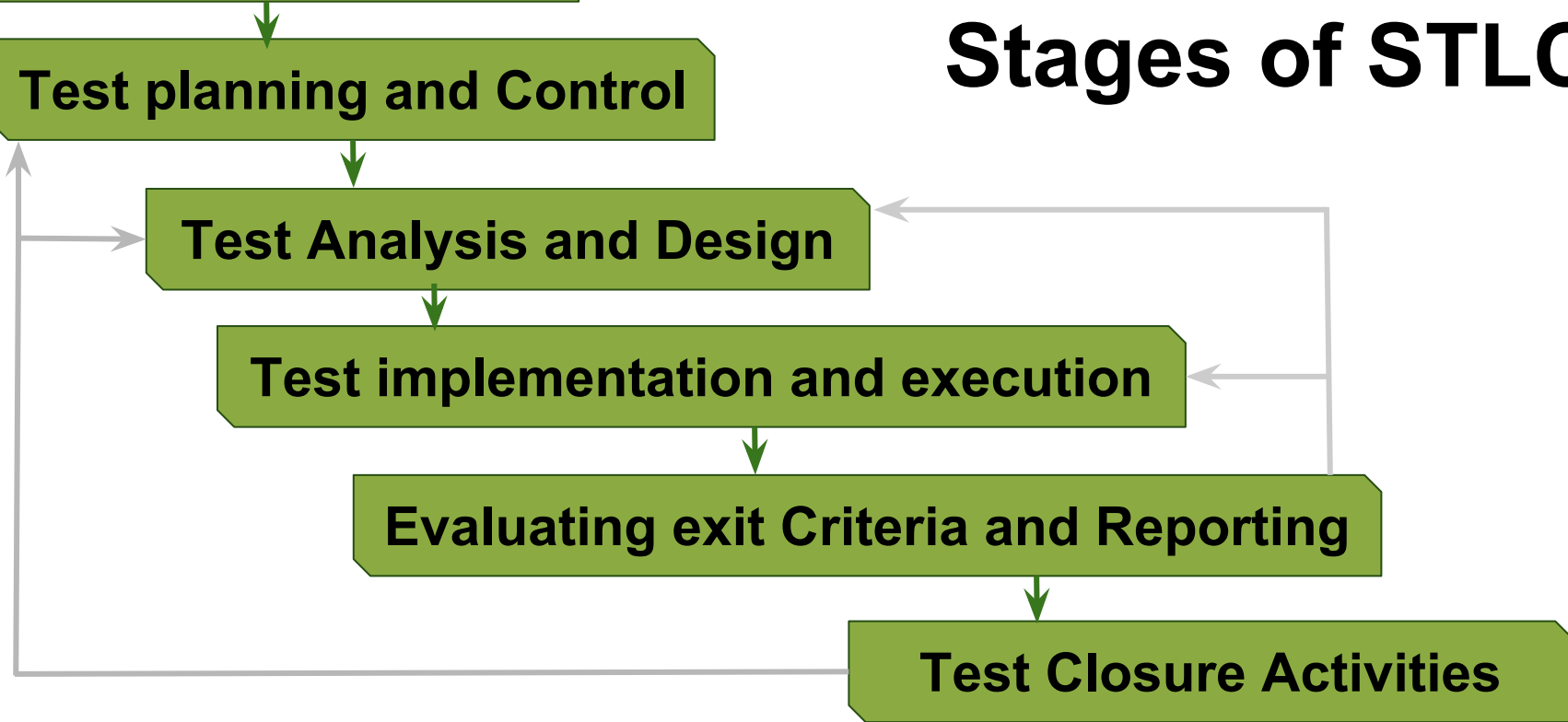
Test planning and Control

Test Analysis and Design

Test implementation and execution

Evaluating exit Criteria and Reporting

Test Closure Activities



Requirement Analysis

Requirements analysis

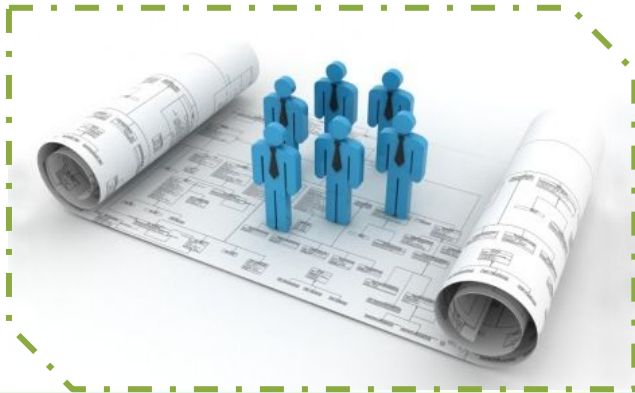
- Identify types of tests to be performed
- Gather details about testing priorities and focus
- Prepare Requirement Traceability Matrix (RTM)
- Identify test environment details where testing is supposed to be carried out
- Automation feasibility analysis (if required)



Test Planning and Control

Test Planning and control

- This phase is also called **Test Strategy** phase. Typically, in this stage, a Senior QA manager will determine effort and cost estimates for the project and would prepare and finalize the Test Plan.
- Starts at the beginning of the software development project
- Must be regularly checked, updated, and adjusted



Test Strategy vs Test Plan

Test Strategy vs Test Plan



Test Strategy:

- is a high level static document
- derived from the Business Requirement Specification document
- sets the standards for testing processes and activities

Test Strategy vs Test Plan

Components Of The Test Strategy Document:

- Scope and Objectives
- Roles and responsibilities
- Test deliverables
- Industry standards to follow
- Test automation and tools
- Testing measurements and metrics
- Risks
- Defect reporting and tracking
- Configuration management
- Training plan

Test Strategy vs Test Plan

Test Plan:

- document derived from the Product Description, Software Requirement Specification, or Use Case Documents.
- The Test Plan document is usually prepared by the Test Lead or Test Manager
- the focus of the document is to describe what to test, how to test, when to test and who will do what test.

Test Planning and Control(2)



Test control

- Monitoring of the test activities
 - Comparing with the plan
- Reporting status of deviations from the plan
- Taking actions for correction
- Updating the test plan according to the feedback
- Software projects are often run under severe time pressure
 - Prioritization guarantees that the critical software parts are tested first

Test Analysis and Design

Test Analysis and Design

- Identify test conditions
 - reviewing the test basis
 - Defining what should be tested
- Designing test cases
 - High level test cases

Sources for expected results:

- Can be the product specification
- Can be another similar product
- The code itself should **not be** used as a source

Test Implementation and Execution

Test Implementation and Execution

- Test conditions and high test cases are transformed into low level test cases
- The environment is set-up to support the test execution activity
- Tests are executed and logged

Test Implementation and Execution(2)

Test execution

- How the tests will be executed?
 - Follows the priority of the test cases set in the test plan
- Grouping test cases into test suites
 - For efficient test execution
 - For easier overview
- Starting testing with the main functions is recommended
 - Failures occurred at this stage make further testing pointless
 - Correction must be done before continuing
- Time pressure may cause running just a subset of all tests
 - Having tests prioritized is important

Test Implementation and Execution(3)

Logging

- The test execution must be exactly and completely logged

What tests were made?



Who made the tests?



Which parts?

When?



With what results?

Software version?

Test Implementation and execution

Failure Found?

What should you do?

Test Implementation and execution(4)

Is it really a failure?

- Erroneous or inexact test specification
- Problematic test infrastructure or test case
- Incorrect test execution



If it is a failure:

- The failure must be documented
- Rough analysis of possible causes
- Additional test cases might be required



After each correction we must check:

- Is the fault really corrected
- Are there new faults introduced



Evaluating Exit Criteria and Reporting

Evaluating Exit Criteria and Reporting

What is exit criteria?

- The set of generic and specific conditions for permitting a process to be officially completed
- Agreed upon with the stakeholders
- Used to report against and to plan when to stop testing

Were test exit criteria fulfilled?

- Test exit criteria might turn to be unrealistic
- Then exit criteria should be corrected



Evaluating Exit Criteria and Reporting(2)

A simple example of test exit criteria might be:

- 100% requirement coverage
- all screens / dialogue boxes / error messages seen
- 100% of test cases have been run
- 100% of high severity faults fixed
- 80% of low & medium severity faults fixed
- maximum of 50 known faults remain
- time has run out
- testing budget is used up



Evaluating Exit Criteria and Reporting(3)

Metrics and measurement

- Test coverage
- Defects
 - Including total found, total fixed, current backlog
- Workload and resource usage
- Planned and actual costs



A lack of metrics and measurements leads to purely subjective assessments of quality and testing. This results in disputes over the meaning of test results toward the end of the lifecycle

Evaluating Exit Criteria and Reporting(4)

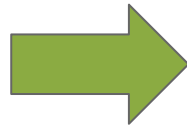
Test summary report

- prepared at the end of a testing project
- after testing is completed
- prime objective of this document is to explain various details and activities about the testing performed for the Project, to the respective stakeholders

Evaluating Exit Criteria and Reporting(5)

Contents of Test summary report:

- Purpose
- Application Overview
- Testing Scope
 - In Scope
 - Out of Scope
 - Items not tested
- Metrics
- Types of testing performed
 - Smoke Testing
 - System Integration testing
 - Regression Testing



Evaluating Exit Criteria and Reporting(6)

Contents of Test summary report:

- Test Environment and Tools
- Lessons Learnt
 - Smoke testing were executed manually each time -> solution: automate them
- Recommendations
- Best Practices
- Exit Criteria
 - All test cases should be executed - Yes
- Conclusion
 - Testing team agrees to give or not a green signal to "Go Live" after Exit Criteria was met
- Definitions

Test Closure Activities

Test Closure Activities

Retrospectives for STLC are made:

What went good? What didn't?

What to improve for future projects?



- The experience should be analyzed and made available for further projects
 - Achieved results
 - Unexpected events
 - What were their causes?
 - Open change requests
 - Why were they not implemented?
 - User acceptance after deploying

Summary

- Define STLC?
- What steps does it have?
- Test Strategy VS Test Plan?
- Sources for expected results?
- What should we test first?
- When should we stop testing?

QUESTIONS