

Software Testing Life Cycle (STLC)



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Software Testing Lifecycle- Overview

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- ▣ Introduction to STLC
- ▣ SDLC vs STLC
- ▣ Requirement Analysis
- ▣ Test Planning
- ▣ Test Case Development
- ▣ Test Environment Setup
- ▣ Test Execution
- ▣ Test Cycle Closure
- ▣ Challenges in STLC
- ▣ Quiz Time

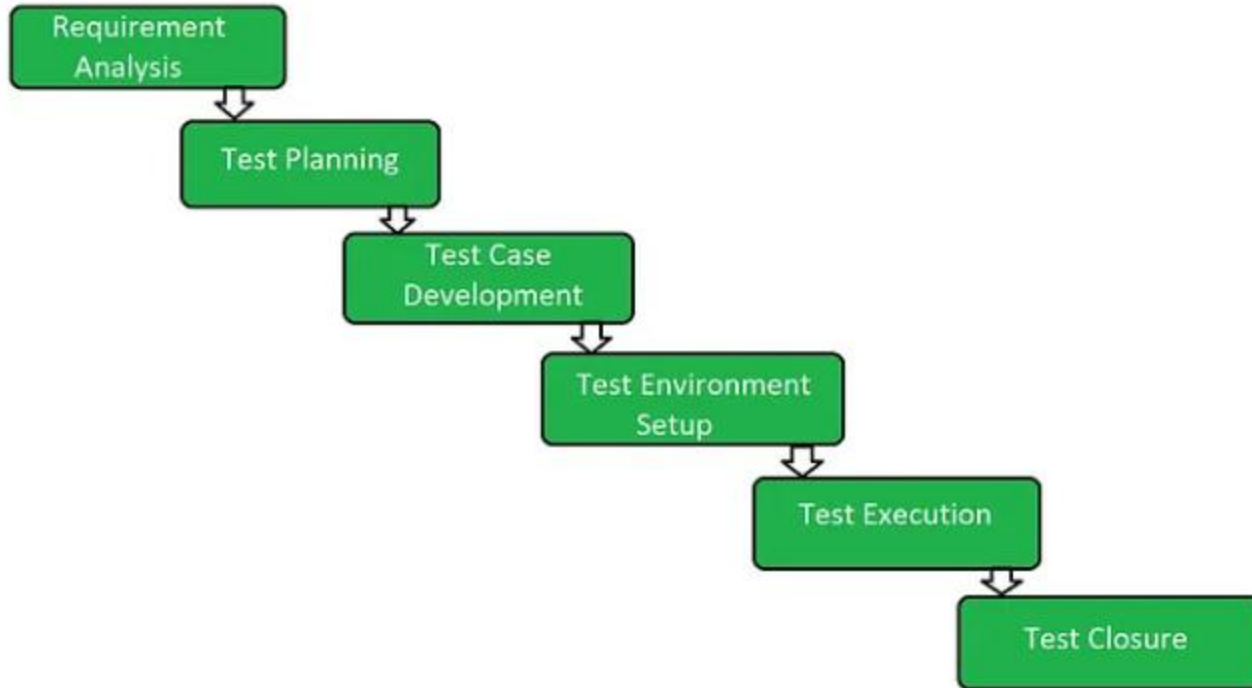
Introduction to STLC

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- ▣ STLC is a **systematic approach** to testing a software application to ensure that it **meets the requirements** and is **free of defects**.
- ▣ Follows a **series of steps** or phases with specific objectives
- ▣ Fundamental part of **SDLC**
- ▣ Why STLC is Important?
 - ▣ Helps in finding defects early
 - ▣ Ensures a systematic approach to testing.
 - ▣ Makes testing measurable and repeatable.
 - ▣ Supports better planning, coverage, and quality control.

Stages of STLC

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Why is it called a Cycle?

because testing is rarely a one-way street

feedback loops, rework, iterations, and continuous improvement make it cyclic

Key Characteristics of SDLC

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- ▣ Phased Approach
- ▣ Goal-Oriented
- ▣ Process-Driven
- ▣ Early Defect Detection
- ▣ Improves Quality
- ▣ Traceability
- ▣ Reusability

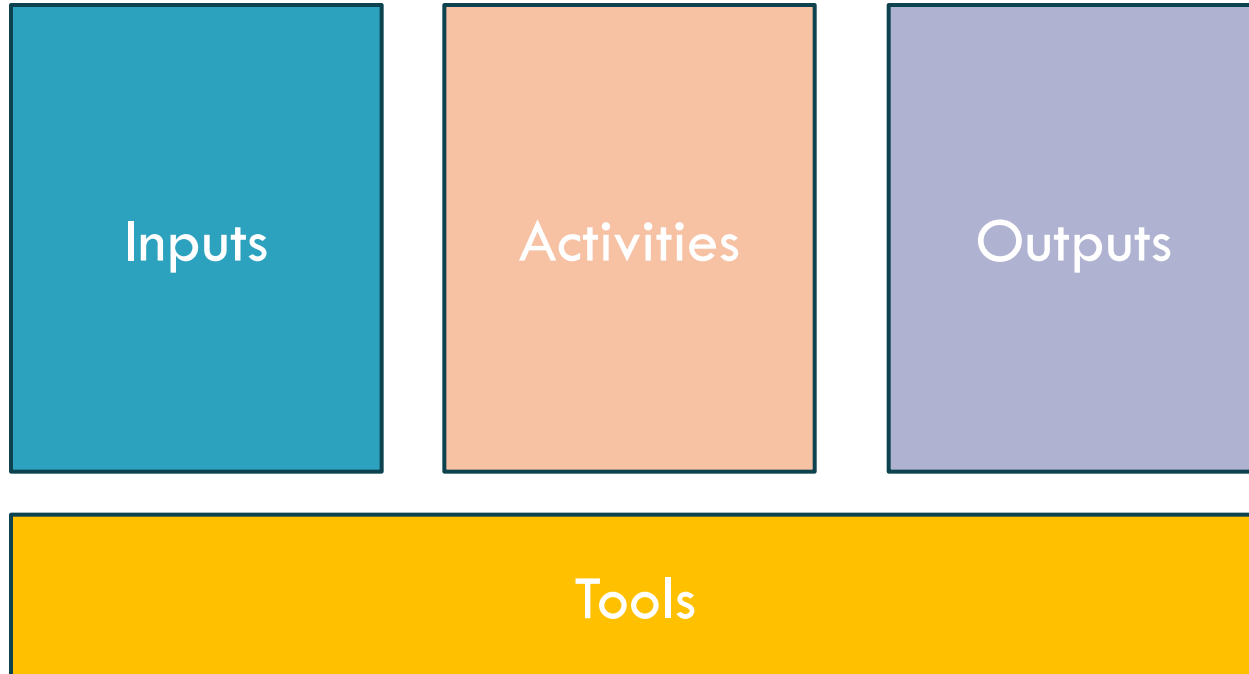
STLC vs SDLC

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Aspect	SDLC > Develop Software	STLC > Test Software
Goal	To build a functioning, high-quality application	To ensure the software works as expected and is bug-free
Focus Area	Covers the entire development (requirements to deployment)	Covers only testing-related activities
Who Performs It	Developers, Architects, Business Analysts, DevOps, etc.	Testers / QA team
Starts When	At the beginning of the software project	When requirements are ready
Output/Deliverables	Working software, system architecture, code, documentation	Test cases, bug reports, test summary reports
End Result	A product ready for release	Verified and validated software

STLC Phase

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Phase 1 – Requirement Analysis

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Phase 1 – Requirement Analysis

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▣ Inputs

- ▣ Business Requirements Document (BRD)
- ▣ Functional Requirements (FRS)
- ▣ Meetings with stakeholders

▣ Activities

- ▣ Analyze requirements for testability
- ▣ Identify types of testing needed
- ▣ Review risks and priorities
- ▣ Identify gaps or missing areas

Phase 1 – Requirement Analysis

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▣ Outputs

- ▣ Requirement Traceability Matrix (RTM)
- ▣ Test automation feasibility
- ▣ Clarification questions or assumptions

▣ Tools

- ▣ JIRA, Confluence (for documentation & tracking)
- ▣ Excel, RTM tools (e.g. Jama Connect)
- ▣ Requirement analysis templates

Requirement Traceability Matrix (RTM)

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A document that maps each requirement to its corresponding design, development, and testing elements.

Requirement Traceability Matrix							
Project Name:	E-commerce Application						
Project ID:	112						
Business Requirmeent Document (BRD)		Functional Requirements Document (FSD)		Test Case Document			
BR_ID	BR_User Case	FR_ID	FR_User Case	Priority	Test Case ID	Status	Comments
BR_1	Product Listing	FR_1	Sort by	High	TC_001 TC_002 TC_004	Finished	Dec 1: Testing started Dec 6: Defect reported Dec 12: Defect Fixed Dec 15: FS_ Passed
		FR_2	Filters	High	TC_001 TC_002 TC_003	Finished	Dec 1: Testing started Dec 6: defect reported Dec 12: Defect Fixed Dec 15: FS_ Passed
BR_2	Payment Module	FR_3	By Credit Card	High	TC_005	In Progress	Dec 1: Testing started
		FR_4	By Debit Card	High	TC_006	In Progress	Dec 1: Testing started
		FR_5	By Reward/Referral P	Medium	TC_007 TC_008	Not Started	

Phase 2 – Test Planning

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▣ Inputs

- ▣ Requirement documents
- ▣ RTM
- ▣ High-level project plan
- ▣ Risk assessment

▣ Activities

- ▣ Define test scope
- ▣ Identify test strategy and approach
- ▣ Estimate time, effort, and resources
- ▣ Assign roles and responsibilities

Phase 2 – Test Planning

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▣ Outputs

- ▣ Test Plan document
- ▣ Effort estimation sheet
- ▣ Resource plan

▣ Tools

- ▣ TestRail, Xray
- ▣ Microsoft Project, Excel
- ▣ Risk analysis tools

Test Plan Template

TEST PLAN TEMPLATE



FEATURES TO BE TESTED (IN-SCOPE)

- Sign-up/Sign-in
- Forget Password
- Delete Account

FEATURES NOT TO BE TESTED

- Edit Account Information
- Create Multiple Accounts

TEST LEVELS AND TEST TYPES

Test Levels

- System Testing
- Acceptance Testing

Test Types

- Functional Testing
- Usability Testing
- Regression Testing

ESTIMATION

- Sign-up/Sign-in: **6 hours**
- Forget Password: **1 hour**
- Delete Account: **1 hour**

STAFFING AND TRAINING

Staffing

- Manual Tester: Anees, Tester 2, ...
- Automation Tester: Tester 3, ...

Training

- TestZephyr: **16 hours**

ASSUMPTIONS

- Developers (Backend + Frontend) deliver the code related to the features
- License for TestZephyr

EXIT CRITERIA

- Testing is finished and there are no functional bugs
- All remaining bugs have low severity
- No more than 10% of medium-severity bugs are open

SUSPENSION CRITERIA

- Critical Bugs are open and they are blocking testing
- All remaining test cases are blocked by an open bug

TEST DELIVERABLES

- Test Cases
- Bugs Report
- Test Summary Report

TEST ENVIRONMENT

- Operating System: Windows 10
- Server: QA - Staging
- Browser: Google Chrome - The last available version
- Network: Wi-Fi

RISKS

List of Risks

- Risk 1 = Late Delivery for Features
- Risk 2 = QA Environment is down
- Risk 3 = Un-planned vacations
- Risk 4 = Critical Bugs keep showing which affect the time frame

Risk Mitigation

- Risk 1 = Risk Acceptance
- Risk 2 = Risk Transfer
- Risk 3 = Risk Monitoring
- Risk 4 = Risk Acceptance

TEST REFERENCES

- User Stories
- Figma Design
- System Design

Phase 3 – Test Case Development

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▣ Inputs

- ▣ Requirement documents
- ▣ Test Plan
- ▣ RTM

▣ Activities

- ▣ Write test cases & test scripts
- ▣ Review and baseline test cases
- ▣ Create test data

Phase 3 – Test Case Development

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▣ Outputs

- ▣ Test cases
- ▣ Test scripts
- ▣ Test data
- ▣ Reviewed and approved test cases

▣ Tools

- ▣ TestLink, Zephyr, TestRail
- ▣ Excel, Word
- ▣ SQL (for test data),
Selenium (for test scripts)

Test Scenario vs Case vs Script vs Data

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Test Scenario	Test Case	Test Script	Test Data
<p>A high-level idea of what needs to be tested.</p> <p>Example: <i>Verify that the user can successfully log in with valid credentials.</i></p>	<p>A detailed set of steps and expected results to validate a specific part of the scenario.</p> <p>Example: Title: Login with valid username and password Steps:</p> <ol style="list-style-type: none">1. Navigate to the login page.2. Enter a valid username.3. Enter a valid password.4. Click the "Login" button. <p>Expected Result: User is redirected to the dashboard.</p>	<p>An automated or manual script that performs the steps in the test case.</p> <p>Example (Manual): A document listing each step to follow.</p> <p>Example (Automated - Selenium in Python):</p> <pre>driver.get("https://example.com/login") driver.find_element(By.ID, "username").send_keys("testuser") driver.find_element(By.ID, "password").send_keys("password123") driver.find_element(By.ID, "login").click() assert "Dashboard" in driver.title</pre>	<p>The input values used during testing.</p> <p>Example: Username: testuser Password: password123</p>

Phase 4 – Test Environment Setup

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▣ Inputs

- ▣ Environment requirements document
- ▣ Software and hardware specs

▣ Activities

- ▣ Set up testing hardware/software
- ▣ Configure test servers, networks
- ▣ Validate setup

Phase 4 – Test Environment Setup

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▣ Outputs

- ▣ Environment ready for testing
- ▣ Test Environment checklist
- ▣ Access and credentials

▣ Tools

- ▣ Cloud platforms (AWS, Azure)
- ▣ Configuration management tools

Different Test Environments

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Development
Environment

Integration Test
Environment

System Test
Environment

UAT (User
Acceptance Testing)
Environment

Staging / Pre-
Production
Environment

Performance / Load
Testing Environment

Security Testing
Environment

Mobile/Device Test
Environment

Sandbox
Environment

Phase 5 – Test Execution

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▣ Inputs

- ▣ Approved test cases
- ▣ Test data
- ▣ Test environment

▣ Activities

- ▣ Execute test cases
- ▣ Log defects/bugs
- ▣ Retest after fixes
- ▣ Update test results

Phase 5 – Test Execution

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▣ Outputs

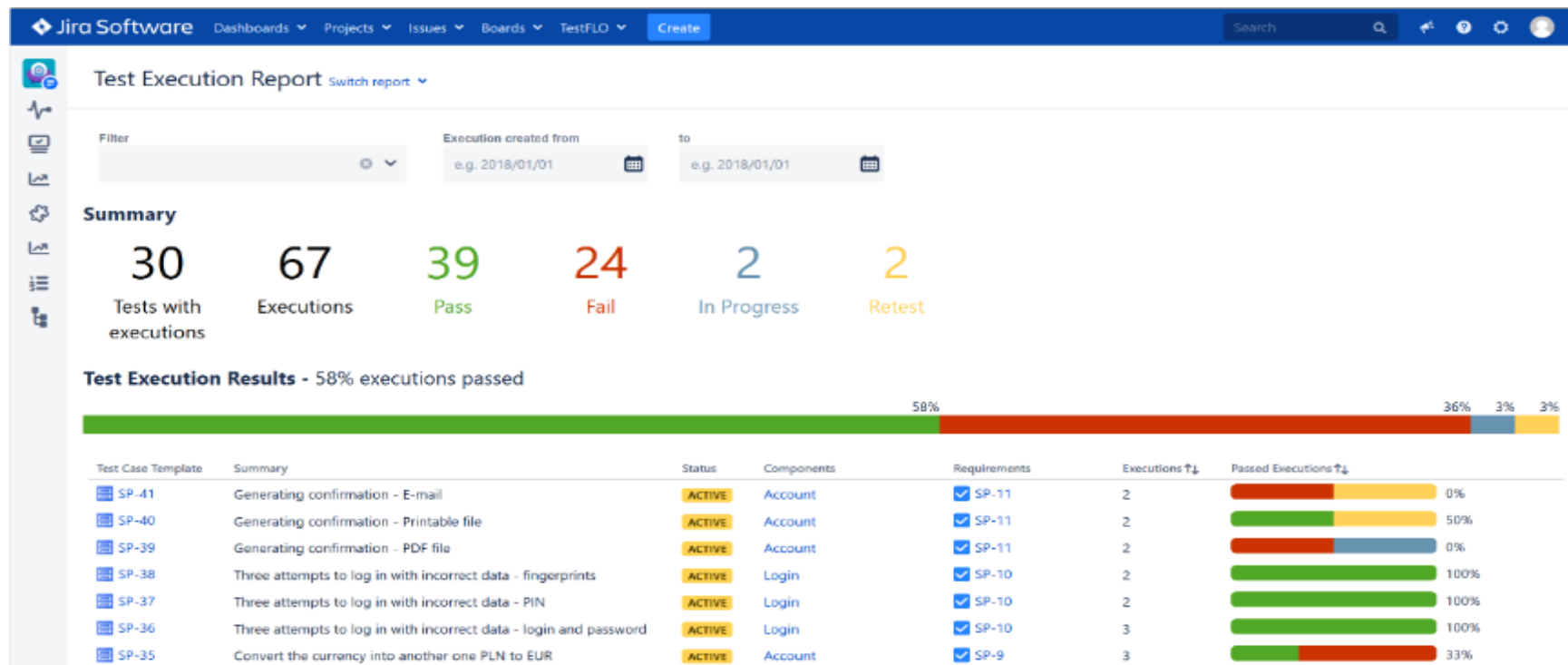
- ▣ Test execution report
- ▣ Defect Report
- ▣ Updated RTM

▣ Tools

- ▣ Selenium, Appium
(automation)
- ▣ JIRA, Bugzilla, Mantis
(bug tracking)
- ▣ TestRail, Zephyr

Test Execution Report

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Phase 6 – Test Cycle Closure

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▣ Inputs

- ▣ Test execution results
- ▣ Defect reports

▣ Activities

- ▣ Evaluate test completion criteria
- ▣ Analyze test coverage, defect density
- ▣ Document lessons learned
- ▣ Archive test artifacts

Phase 6 – Test Cycle Closure

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▣ Outputs

- ▣ Test Summary Report
- ▣ Test metrics & closure checklist
- ▣ Lessons learned document

▣ Tools

- ▣ Excel/Google Sheets (for reporting)
- ▣ Reporting tools (QMetry, TestRail)
- ▣ Confluence, SharePoint (for documentation)

Test Metrics

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Process

- ▣ Test Case Effectiveness
- ▣ Cycle Time
- ▣ Defect Fixing Time

Product

- ▣ Number of Defects
- ▣ Defect Severity
- ▣ Passed/Failed Test Cases

Project

- ▣ Test Coverage
- ▣ Cost of Testing
- ▣ Budget/Schedule Variance

SDLC - In Summary

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Requirement Analysis → **Understand what to test**

Test Planning → **Plan how to test**

Test Case Development → **Write test steps**

Test Environment Setup → **Get systems ready**

Test Execution → **Run tests, find bugs**

Test Closure → **Wrap up and report**

Challenges in STLC

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- ▣ Unclear or Changing Requirements
- ▣ Time Constraints
- ▣ Lack of Collaboration
- ▣ Environment Issues
- ▣ Tooling and Automation Challenges
- ▣ Frequent Scope Creep or Last-Minute Changes
- ▣ Knowledge Gaps / Inexperienced Testers

Quiz Time

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Mentimeter

Instructions

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Thank **30** You

Q & A

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