# STLC

## Different Phases of the STLC Model

[](https://www.guru99.com/images/stories/software-test-life-cycle.jpg)

STLC Diagram

**Below are the phases of STLC:**

* Requirement Analysis.
* Test Planning.
* Test case development.
* Test Environment setup.
* Test Execution.
* Test Cycle closure.

## Requirement Analysis

During this phase, test team studies the requirements from a testing point of view to identify the testable requirements.

The QA team may interact with various stakeholders (Client, Business Analyst, Technical Leads, and System Architects etc) to understand the requirements in detail.

Requirements could be either Functional (defining what the software must do) or Non Functional (defining system performance /security availability)

**Activities**

* Identify types of tests to be performed.
* Gather details about testing priorities and focus.
* Prepare [Requirement Traceability Matrix (RTM)](https://www.guru99.com/traceability-matrix.html).
* Identify test environment details where testing is supposed to be carried out.
* Automation feasibility analysis (if required).

**Deliverables**

* RTM.
* Automation feasibility report. (if applicable).

## Test Planning

A document describing the scope, approach, resources and schedule of intended test activities. It identifies amongst others test items, the features to be tested, the testing tasks, who will do each task, degree of tester independence, the test environment, the test design techniques and entry and exit criteria to be used, and the rationale for their choice, and any risks requiring contingency planning. It is a record of the test planning process.

**Activities**

* Preparation of test plan/strategy document for various types of testing.
* Test tool selection.
* Test effort estimation.
* Resource planning and determining roles and responsibilities.
* Training requirement.

**Deliverables**

* [Test plan](https://www.guru99.com/what-everybody-ought-to-know-about-test-planing.html) /strategy document.
* [Effort estimation](https://www.guru99.com/an-expert-view-on-test-estimation.html) document.

## Test Case Development

A **TEST CASE** is a set of conditions or variables under which a tester will determine whether a system under test satisfies requirements or works correctly.

**We say that test case is a step by step procedure**

**Activities**

* Create test cases, automation scripts (if applicable).
* Review and baseline test cases and scripts.
* Create test data (If Test Environment is available).

**Deliverables**

* Test cases/scripts.
* Test data.

## Writing Good Test Cases

* As far as possible, 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 your test cases ‘atomic’.
* Ensure that all positive scenarios AND negative scenarios are covered.
* Language:
  + Write in simple and easy-to-understand language.
  + Use active voice instead of passive voice: Do this, do that.
  + Use exact and consistent names (of forms, fields, etc).
* Characteristics of a good test case:
  + Accurate: Exacts the purpose.
  + Economical: No unnecessary steps or words.
  + Traceable: Capable of being traced to requirements.
  + Repeatable: Can be used to perform the test over and over.
  + Reusable: Can be reused if necessary.

## Test Environment Setup

Test environment decides the software and hardware conditions under which a work product is tested. Test environment set-up is one of the critical aspects of testing process and ***can be done in parallel with Test Case Development Stage***. ***Test team may not be involved in this activity*** if the customer/development team provides the test environment in which case the test team is required to do a readiness check (smoke testing) of the given environment.

**Activities**

* Understand the required architecture, environment set-up and prepare hardware and software requirement list for the Test Environment.
* Setup test Environment and test data
* Perform smoke test on the build

**Deliverables**

* Environment ready with test data set up
* Smoke Test Results.

## Test Execution

During this phase, the testers will carry out the testing based on the test plans and the test cases prepared. Bugs will be reported back to the development team for correction and retesting will be performed.

**Activities**

* Execute tests as per plan.
* Document test results, and log defects for failed cases.
* Map defects to test cases in RTM.
* Retest the[Defect](https://www.guru99.com/defect-management-process.html)fixes.
* Track the defects to closure.

**Deliverables**

* Completed RTM with the execution status.
* Test cases updated with results.
* Defect reports.

## Test Cycle Closure

Testing team will meet, discuss and analyze testing artifacts to identify strategies that have to be implemented in the future, taking lessons from the current test cycle. The idea is to remove the process bottlenecks for future test cycles and share best practices for any similar projects in the future.

**Activities**

* Evaluate cycle completion criteria based on Time, Test coverage, Cost, Software, Critical Business Objectives, Quality
* Prepare test metrics based on the above parameters.
* Document the learning out of the project
* Prepare Test closure report
* Qualitative and quantitative reporting of quality of the work product to the customer.
* Test result analysis to find out the defect distribution by type and severity.

**Deliverables**

* Test Closure report.
* Test metrics.

## Which Testing Are Best API Or GUI Testing?

GUI Testing best for automation.

## What goes into a Functional Specification Or Documents?

The purpose of a functional specification is to define the requirements to be implemented by the software solution.

Most common formats

### Functional Requirements Document.

A **Functional Requirement** (FR) is a description of the service that the software must offer. It describes a software system or its component. A function is nothing but inputs to the software system, its behavior, and outputs. It can be a calculation, data manipulation, business process, user interaction, or any other specific functionality which defines what function a system is likely to perform. Functional Requirements are also called **Functional Specification**.

### Functional Requirements should include the following things:

* Details of operations conducted in every screen.
* Data handling logic should be entered into the system.
* It should have descriptions of system reports or other outputs.
* Complete information about the workflows performed by the system.
* It should clearly define who will be allowed to create/modify/delete the data in the system.
* How the system will fulfill applicable regulatory and compliance needs should be captured in the functional document.

### ****Software requirements Specification****.

A **software requirements specification** (SRS) is a detailed description of a software system to be developed with its functional and non-functional requirements. The SRS is developed based the agreement between customer and contractors. It may include the use cases of how user is going to interact with software system. The software requirement specification document consistent of all necessary requirements required for project development. To develop the software system we should have clear understanding of Software system. To achieve this we need to continuous communication with customers to gather all requirements.

* Business Requirements Document (contrary to the name, they commonly do not include only business requirements but also functional, software requirements).
* Use Cases.
* User Stories.

## What is Requirement Traceability Matrix?

**Requirement Traceability Matrix (RTM)** is a document that maps and traces user requirement with test cases. It captures all requirements proposed by the client and requirement traceability in a single document, delivered at the conclusion of the Software development life cycle. The main purpose of Requirement Traceability Matrix is to validate that all requirements are checked via test cases such that no functionality is unchecked during Software testing.

## ****What is Testware?****

Testware is test artifacts like test cases, test data, test plans needed to design and execute a test.

**What are the automation challenges that SQA(Software Quality Assurance) team faces while testing?**

* Mastering the automation tool
* Reusability of Automation script
* Adaptability of test case for automation
* Automating complex test cases.

## ****What is bug leakage and bug release?****

Bug release is when software or an application is handed over to the testing team knowing that the defect is present in a release. During this the priority and severity of bug is low, as bug can be removed before the final handover.

Bug leakage is something, when the bug is discovered by the end users or customer, and not detected by the testing team while testing the software.

## ****What is data driven testing?****

Data driven testing is an automation testing framework, which tests the different input values on the AUT. These values are read directly from the data files. The data files may include csv files, excel files, data pools and many more.

**7) Explain the steps for Bug Cycle?**

* Once the bug is identified by the tester, it is assigned to the development manager in open status
* If the bug is a valid defect the development team will fix it.
* If it is not a valid defect, the defect will be ignored and marked as rejected
* The next step will be to check whether it is in scope. If the bug is not the part of the current release then the defects are postponed
* If the defect or bug is raised earlier then the tester will assign a DUPLICATE status
* When bug is assigned to developer to fix, it will be given a IN-PROGRESS status
* Once the defect is repaired, the status will change to FIXED at the end the tester will give CLOSED status if it passes the final test.

**8) What does the test strategy include?**

The test strategy includes an introduction, resource, scope and schedule for test activities, test tools, test priorities, test planning and the types of test that has to be performed.

**11) What are the contents of test plans and test cases?**

* Testing objectives
* Testing scope
* Testing the frame
* The environment
* Reason for testing
* The criteria for entrance and exit
* Deliverables
* Risk factors

## **What is agile testing and what is the importance of Agile testing?**

Agile testing is software testing, is testing using Agile Methodology. The importance of this testing is that, unlike normal testing process, this testing does not wait for the development team to complete the coding first and then doing testing. The coding and testing both goes simultaneously. It requires continuous customer interaction.

# ****Test case****

## ****What is Test case?****

Test case is a specific condition to check against the Application Under Test. It has information of test steps, prerequisites, test environment, and outputs.

## ****What is quality audit?****

The systematic and independent examination for determining the effectiveness of quality control procedures is known as the quality audit.

## ****What are the tools used by a tester while testing?****

* Selenium
* Firebug
* OpenSTA
* WinSCP
* YSlow for FireBug
* Web Developer toolbar for firebox

Above are just sample tools. The tools a Tester may vary with his/her project.

## ****What are the five common solutions for software developments problems?****

* Setting up the requirements criteria, the requirements of a software should be complete, clear and agreed by all
* The next thing is the realistic schedule like time for planning , designing, testing, fixing bugs and re-testing
* Adequate testing, start the testing immediately after one or more modules development.
* Use rapid prototype during design phase so that it can be easy for customers to find what to expect
* Use of group communication tools

## ****What is a 'USE' case and what does it include?****

The document that describes, the user action and system response, for a particular functionality is known as USE case. It includes revision history, table of contents, flow of events, cover page, special requirements, pre-conditions and post-conditions.

**22) What is configuration management?**

It is a process to control and document any changes made during the life of a project. Release control, Change control and Revision control are the important aspects of configuration management.

**24) List out the roles of Software Quality Assurance engineer?**

A software quality assurance engineer tasks may include following things amongst others

* Writing source code
* Software design
* Control of source code
* Reviewing code
* Change management
* Configuration management
* Integration of software
* Program testing
* Release management process

**25) Explain what are test driver and test stub and why it is required?**

* The stub is called from the software component to be tested. It is used in top down approach
* The driver calls a component to be tested. It is used in bottom up approach
* It is required when we need to test the interface between modules X and Y and we have developed only module X. So we cannot just test module X but if there is any dummy module we can use that dummy module to test module X

**26) Explain what is Bug triage?**

A bug triage is a process to

* Ensure bug report completeness
* Assign and analyze the bug
* Assigning bug to proper bug owner
* Adjust bug severity properly
* Set appropriate bug priority

**28) What is a cause effect graph?**

A cause effect graph is a graphical representation of inputs and the associated outputs effects that can be used to design test cases.

**29) What is a Test Metric in software testing and what information does it contains?**

In software testing, Test Metric is referred to the standard of test measurement. They are the statistics narrating the structure or content of a testing. It contains information like

* Total test
* Test run
* Test passed
* Test failed
* Tests deferred
* Test passed the first time

## ****Explain what is traceability matrix?****

A test matrix is used to map test scripts to requirements.

## ****List out the software quality practices through the software development cycle?****

* Software quality practices includes
* Review the requirements before starting the development phase
* Code Review
* Write comprehensive test cases
* Session based testing
* Risk based testing
* Prioritize bug based on usage
* Form a dedicated security and performance testing team
* Run a regression cycle
* Perform sanity tests on production
* Simulate customer accounts on production
* Include software QA Test Reports

## ****Explain what is the rule of a "Test Driven Development"?****

The rule of a Test Driven Development is to prepare test cases before writing the actual code. Which means you are actually be writing code for the tests before you write code for the application.

## ****Mention what are the types of documents in SQA?****

* The types of documents in SQA are
* Requirement Document
* Test Metrics
* Test cases and Test plan
* Task distribution flow chart
* Transaction Mix
* User profiles
* Test log
* Test incident report
* Test summary report

## ****Explain what should your QA documents include?****

* QA testing document should include
* List the number of defects detected as per severity level
* Explain each requirement or business function in detail
* Inspection reports
* Configurations
* Test plans and test cases
* Bug reports
* User manuals
* Prepare separate reports for managers and users

## ****Explain what is MR and what information does MR consists of?****

MR stands for Modification Request also referred as Defect report. It is written for reporting errors/problems/suggestions in the software.

## ****What does the software QA document should include?****

Software QA document should include

* Specifications
* Designs
* Business rules
* Configurations
* Code changes
* Test plans
* Test cases
* Bug reports
* User manuals, etc

## ****Mention how validation activities should be conducted?****

Validation activities should be conducted by following techniques

* Hire third party independent verification and validation
* Assign internal staff members that are not involved in validation and verification activities
* Independent evaluation

# ****Testing****

## Functional Testing

**Functional Testing** is a type of software testing whereby the system is tested against the functional requirements/specifications.

Typically, functional testing involves the following steps:

* Identify functions that the software is expected to perform.
* Create input data based on the function’s specifications.
* Determine the output based on the function’s specifications.
* Execute the [test case](http://softwaretestingfundamentals.com/test-case/).
* Compare the actual and expected outputs.

Integration Testing

**Integration Testing** is a level of software testing where individual units are combined and tested as a group. The purpose of this level of testing is to expose faults in the interaction between integrated units. Test drivers and test stubs are used to assist in Integration Testing.

## Regression testing

**Regression Testing**is the process of testing the modified parts of the code and the parts that might get affected due to the modifications to ensure that no new errors have been introduced in the software after the modifications have been made. Regression means return of something and in the software field, it refers to the return of a bug.

## Smoke testing

Smoke Testing, also known as “Build Verification Testing”, is a type of software testing that comprises of a non-exhaustive set of tests that aim at ensuring that the most important functions work. The result of this testing is used to decide if a build is stable enough to proceed with further testing.

## End-to-end testing

**End-to-end testing** is a technique used to test whether the flow of an application right from start to finish is behaving as expected. The purpose of performing **end-to-end testing** is to identify system dependencies and to ensure that the data integrity is maintained between various system components and systems.

## ****Cross Browser testing****

**Cross Browser testing** is a type of non-functional testing that lets you check whether your website works as intended when accessed through

## ****Ad Hoc testing?****

It is a testing phase where the tester tries to break the system by randomly trying the system's functionality. It can include negative testing as well.

Positive testing

Determines that your application works as expected. If an error is encountered during positive testing, the test fails.

## Negative testing

Ensures that your application can gracefully handle invalid input or unexpected user behavior. For example, if a user tries to type a letter in a numeric field, the correct behavior in this case would be to display the “Incorrect data type, please enter a number” message. The purpose of negative testing is to detect such situations and prevent applications from crashing. Also, negative testing helps you improve the quality of your application and find its weak points.

## Load Testing:

Testing an application under heavy but expected load is known as Load Testing. Here, the load refers to the large volume of users, messages, requests, data, etc.

## Stress Testing:

When the load placed on the system is raised or accelerated beyond the normal range then it is known as Stress Testing.

## **Volume Testing:**

The process of checking the system, whether the system can handle the required amounts of data, user requests, etc. is known as Volume Testing.

## ****Data Driven Testing?****

Data driven testing is an automation testing framework, which tests the different input values on the AUT. These values are read directly from the data files. The data files may include csv files, excel files, data pools and many more.

## ****CRUD testing and how to test CRUD?****

CRUD stands for Create, Read, Update and Delete. CRUD testing can be done using SQL statements.

## ****Thread testing?****

A thread testing is a top-down testing, where the progressive integration of components follows the implementation of subsets of the requirements, as opposed to the integration of components by successively lower levels.

## B****ranch Testing****

The testing of all the branches of the code, which is tested once, is known as branch testing.

## ****Boundary Testing****

While the testing, that is focused on the limit conditions of the software is known as boundary testing.

# Difference

## ****Difference between QA and software testing?****

The role of QA (Quality Assurance) is to monitor the quality of the "process" used to produce the software. While the software testing, is the process of ensuring the functionality of final product meets the user's requirement.

## Difference between White box and Black box testing?

[**Black Box Testing**](https://www.geeksforgeeks.org/software-engineering-black-box-testing/)

is a software testing method in which the internal structure/ design/ implementation of the item being tested is not known to the tester

[**White Box Testing**](https://www.geeksforgeeks.org/software-engineering-white-box-testing/)

is a software testing method in which the internal structure/ design/ implementation of the item being tested is known to the tester.

## ****Difference between build and release?****

Build: It is a number given to Installable software that is given to the testing team by the development team.

Release: It is a number given to Installable software that is handed over to the customer by the tester or developer.

## ****Difference between Regression testing and retesting?****

Retesting is carried out to check the defects fixes, while regression testing is performed to check whether the defect fix have any impact on other functionality.

# Scram

## Who will be involved in Agile testing meeting?

The product owner, Scrum Master, and development team should all be present so that they can all hear the same feedback and be able to answer questions regarding the sprint and the product increment.

## What is DSR ,WSR?

DSR is Daily Status Report WSR is Weekly

Status Report

## What is the test design you have used to write test cases?

Use Case Testing