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**INTRODUCTION TO SOFTWARE TESTING LIFECYLCE**

Software Testing Life Cycle (STLC) is a sequence of specific activities conducted during the testing process to ensure software quality goals are met. STLC involves both verification and validation activities. Contrary to popular belief, Software Testing is not just a single/isolate activity, i.e. testing. It consists of a series of activities carried out methodologically to help certify your software product. STLC stands for Software Testing Life Cycle.

**What is Entry and Exit Criteria in STLC?**

* Entry Criteria: Entry Criteria gives the prerequisite items that must be completed before testing can begin.
* Exit Criteria: Exit Criteria defines the items that must be completed before testing can be concluded

You have Entry and Exit Criteria for all levels in the Software Testing Life Cycle (STLC)

**Phases of STLC:**

1. **Requirement Analysis:**

Requirement Analysis is the first step of the Software Testing Life Cycle (STLC). In this phase quality assurance team understands the requirements like what is to be tested. If anything is missing or not understandable then the quality assurance team meets with the stakeholders to better understand the detailed knowledge of requirements.

The activities that take place during the Requirement Analysis stage include:

* Reviewing the software requirements document (SRD) and other related documents
* Interviewing stakeholders to gather additional information
* Identifying any ambiguities or inconsistencies in the requirements
* Identifying any missing or incomplete requirements
* Identifying any potential risks or issues that may impact the testing process
* Creating a requirement traceability matrix (RTM) to map requirements to test cases

At the end of this stage, the testing team should have a clear understanding of the software requirements and should have identified any potential issues that may impact the testing process. This will help to ensure that the testing process is focused on the most important areas of the software and that the testing team is able to deliver high-quality results.

**Deliverables of Requirement Phase Testing**

* RTM
* Automation feasibility report. (if applicable)

1. **Test Planning:**

Test Planning is the most efficient phase of the software testing life cycle where all testing plans are defined. In this phase manager of the testing, team calculates the estimated effort and cost for the testing work. This phase gets started once the requirement-gathering phase is completed.

The activities that take place during the Test Planning stage include:

* Identifying the testing objectives and scope
* Developing a test strategy: selecting the testing methods and techniques that will be used
* Identifying the testing environment and resources needed
* Identifying the test cases that will be executed and the test data that will be used
* Estimating the time and cost required for testing
* Identifying the test deliverables and milestones
* Assigning roles and responsibilities to the testing team
* Reviewing and approving the test plan

At the end of this stage, the testing team should have a detailed plan for the testing activities that will be performed, and a clear understanding of the testing objectives, scope, and deliverables. This will help to ensure that the testing process is well-organized and that the testing team is able to deliver high-quality results.

**Deliverables of Test Planning**

* Test plan /strategy document.
* Effort estimation document.

1. **Test Case Development:**

The test case development phase gets started once the test planning phase is completed. In this phase testing team notes down the detailed test cases. The testing team also prepares the required test data for the testing. When the test cases are prepared then they are reviewed by the quality assurance team.

The activities that take place during the Test Case Development stage include:

* Identifying the test cases that will be developed
* Writing test cases that are clear, concise, and easy to understand
* Creating test data and test scenarios that will be used in the test cases
* Identifying the expected results for each test case
* Reviewing and validating the test cases
* Updating the requirement traceability matrix (RTM) to map requirements to test cases

At the end of this stage, the testing team should have a set of comprehensive and accurate test cases that provide adequate coverage of the software or application. This will help to ensure that the testing process is thorough and that any potential issues are identified and addressed before the software is released.

**Deliverables of Test Case Development**

* Test cases/scripts
* Test data

1. **Test Environment Setup:**

Test environment setup is a vital part of the STLC. Basically, the test environment decides the conditions on which software is tested. This is independent activity and can be started along with test case development. In this process, the testing team is not involved. either the developer or the customer creates the testing environment.

**Deliverables of Test Environment Setup**

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

1. **Test Execution:**

After the test case development and test environment setup test execution phase gets started. In this phase testing team starts executing test cases based on prepared test cases in the earlier step.

The activities that take place during the test execution stage of the Software Testing Life Cycle (STLC) include:

* Test execution: The test cases and scripts created in the test design stage are run against the software application to identify any defects or issues.
* Defect logging: Any defects or issues that are found during test execution are logged in a defect tracking system, along with details such as the severity, priority, and description of the issue.
* Test data preparation: Test data is prepared and loaded into the system for test execution
* Test environment setup: The necessary hardware, software, and network configurations are set up for test execution
* Test execution: The test cases and scripts are run, and the results are collected and analysed.
* Test result analysis: The results of the test execution are analysed to determine the software’s performance and identify any defects or issues.
* Defect retesting: Any defects that are identified during test execution are retested to ensure that they have been fixed correctly.
* Test Reporting: Test results are documented and reported to the relevant stakeholders.

It is important to note that test execution is an iterative process and may need to be repeated multiple times until all identified defects are fixed and the software is deemed fit for release.

**Deliverables of Test Execution**

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

1. **Test Closure:**

Test closure is the final stage of the Software Testing Life Cycle (STLC) where all testing-related activities are completed and documented.

The main objective of the test closure stage is to ensure that all testing-related activities have been completed and that the software is ready for release.

At the end of the test closure stage, the testing team should have a clear understanding of the software’s quality and reliability, and any defects or issues that were identified during testing should have been resolved.

The test closure stage also includes documenting the testing process and any lessons learned so that they can be used to improve future testing processes

Test closure is the final stage of the Software Testing Life Cycle (STLC) where all testing-related activities are completed and documented. The main activities that take place during the test closure stage include:

* Test summary report: A report is created that summarizes the overall testing process, including the number of test cases executed, the number of defects found, and the overall pass/fail rate.
* Defect tracking: All defects that were identified during testing are tracked and managed until they are resolved.
* Test environment clean-up: The test environment is cleaned up, and all test data and test artifacts are archived.
* Test closure report: A report is created that documents all the testing-related activities that took place, including the testing objectives, scope, schedule, and resources used.
* Knowledge transfer: Knowledge about the software and testing process is shared with the rest of the team and any stakeholders who may need to maintain or support the software in the future.
* Feedback and improvements: Feedback from the testing process is collected and used to improve future testing processes

**Deliverables of Test Cycle Closure**

* Test Closure report
* Test metrics

**Difference between SDLC and STLC:**

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| **SDLC** | **STLC** |
| In SDLC, development team makes the plans and designs based on the requirements. | In STLC, testing team makes the plans and designs. |
| Goal of SDLC is to complete successful development of the software product. | Goal of STLC is to complete successful testing of the software. |
| It helps in developing good quality Software | It helps in making the software defect free. |
| SDLC phases are completed before the STLC phases starts. | STLC phases are performed after the SDLC phases. |
| Post deployment support, enhancement, and update are to be included if necessary. | Regression tests are run by QA team to check deployed maintenance code and maintains test cases and automated scripts. |
| Besides development, other phases like testing are also included. | Focuses on only testing the software. |
| SDLC involves total of six phases. | STLC involves only five phases. |
| In SDLC, a greater number of members are required for the whole process. | In STLC, a smaller number of members (testers) are needed. |
| Creation of reusable software systems is the end result of SDLC. | A tested software system is the end result of STLC. |