**What is STLC and SDLC?**

**References:** [**https://www.guru99.com/software-testing-life-cycle.html**](https://www.guru99.com/software-testing-life-cycle.html)

**STLC**

**STLC (Software Testing Life Cycle) (PĮ testavimo ciklas)** 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.

**STLC Phases:**

1. Requirement Analysis
2. Test Planning
3. Test case development
4. Test Environment setup
5. Test Execution
6. Test Cycle closure

**Each of these stages has a definite Entry and Exit criteria**, Activities & Deliverables associated with it.

**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).

In an Ideal world, you will not enter the next stage until the exit criteria for the previous stage is met. But practically this is not always possible.

1. **Requirement Analysis (Requirement Phase Testing)**

Test team studies the requirements from a testing point of view to identify testable requirements. The QA team may interact with various stakeholders (Client, Business Analyst, Technical Leads, System Architects, etc) to understand requirements in detail. Requirements could be either functional or non-functional. Automation feasibility (įvykdomumas) for the testing project is also done in this stage.

**Stakeholders -** **those with an interest in your project's outcome**. They are typically the members of a project team, project managers, executives, project sponsors, customers, and users.

**Activities in Requirement Phase Testing:**

* 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).

**Requirements Traceability Matrix** **(RTM)** is a document used to ensure that the requirements defined for a system are linked at every point during the verification process. It's used to prove that requirements have been fulfilled. And it typically documents requirements, tests, test results, and issues.

**Deliverables of Requirement Phase Testing:**

* RTM
* Automation feasibility report. (if applicable)

1. **Test Planning in STLC**

Test Planning in STLC is a phase in which a Senior QA manager **determines the test plan strategy along with efforts and cost estimates for the project.** Moreover, the resources, test environment, test limitations and the testing schedule are also determined. The Test Plan gets prepared and finalized in the same phase.

**Test Planning 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 of Test Planning:**

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

1. **Test Case Development Phase**

The Test Case Development Phase **involves the creation, verification and rework of test cases & test scripts after the test plan is ready.** Initially, the Test data is identified -> created and reviewed -> reworked based on the preconditions. Then the QA team starts the development process of test cases for individual units.

**Test Case Development Activities:**

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

1. **Test Environment Setup**

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

**Test Environment Setup 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 of Test Environment Setup:**

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

**Smoke testing** checks the core functionality of a program, **to ensure that the program is ready for further testing.** This prevents a QA team from attempting to run a full test of software that can't complete basic functions. To build a smoke test, the test team first determines which parts of the application make up the high-level functionality, and then develops automated procedures for **testing the major parts of the system.** **In this context, *major* refers to the basic operations that are used most frequently.** These operations can be exercised to determine if there are any small or large flaws in the software. **Examples of major functions** include logging in, adding records, deleting records, and generating reports. Smoke tests may also comprise a series of tests verifying that the database points to the correct environment, the database is the correct version, sessions can be launched, all screens and menu selections are accessible, and data can be entered, selected and edited.

Reference: <https://www.tiempodev.com/blog/what-is-smoke-testing-in-software-testing/>

1. **Test Execution Phase**

Test Execution Phase is carried out by the testers in which **testing of the software build is done based on test plans and test cases prepared. The process consists of test script execution, test script maintenance (priežiūra) and bug reporting.** If bugs are reported then it is reverted back to development team for correction and retesting will be performed.

**Test Execution 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 fixes
* Track the defects to closure

**Deliverables of Test Execution:**

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

1. **Test Cycle Closure**

Test Cycle Closure phase is **completion of test execution which involves several activities like test completion reporting, collection of test completion matrices and test results.** Testing team members meet, discuss and analyze testing artifacts to identify strategies that have to be implemented in future, taking lessons from current test cycle. The idea is to remove process bottlenecks for future test cycles.

**Test Cycle Closure 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 of Test Cycle Closure:**

* Test Closure report
* Test metrics

**A bottleneck** is **a point of congestion in a production system** (such as an assembly line or a computer network) that occurs **when workloads arrive too quickly** for the production process to handle.

**SDLC**

**Reference:** [**https://www.guru99.com/software-development-life-cycle-tutorial.html**](https://www.guru99.com/software-development-life-cycle-tutorial.html)

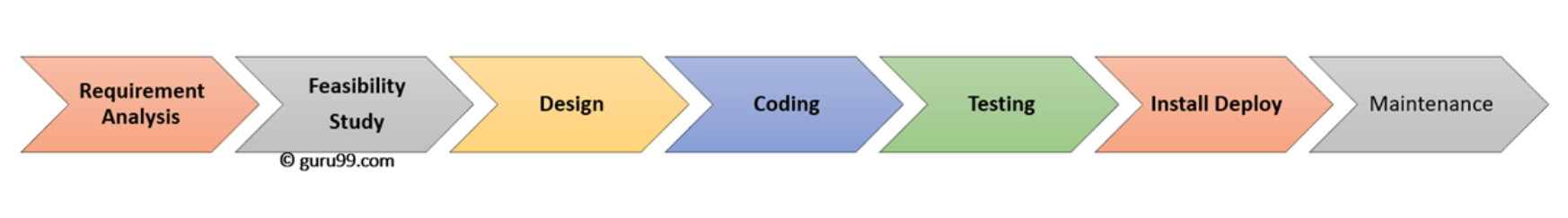
**SDLC (Software Development Life Cycle)** **(PĮ kūrimo ciklas)** is a **systematic process for building software that ensures the quality and correctness of the software built.** SDLC process aims to produce high-quality software that meets customer expectations.

SDLC consists of a detailed plan which explains how to plan, build, and maintain specific software. **Every phase of the SDLC** **has its own process and deliverables that feed into the next phase.**

**Why SDLC?**

* It offers a basis for project planning, scheduling, and estimating
* Provides a framework for a standard set of activities and deliverables
* It is a mechanism for project tracking and control
* Increases visibility of project planning to all involved stakeholders of the development process
* Increased and enhance development speed
* Improved client relations
* Helps you to decrease project risk and project management plan overhead

**SDLC Phases:**

**Phase 1: Requirement collection and analysis**

The requirement is the first stage in the SDLC process. It is conducted by the senior team members with inputs from all the stakeholders and domain experts in the industry. Planning for the QA requirements and recognition of the risks involved is also done at this stage.

**This stage gives a clearer picture of the scope of the entire project** and the anticipated issues, opportunities, and directives which triggered the project.

Requirements Gathering stage need teams to get detailed and precise requirements. This helps companies to finalize the necessary timeline to finish the work of that system.

Example: Add Login service on website. Etc.

**Phase 2: Feasibility study**

Once the requirement analysis phase is completed the next SDLC step is **to define and document software needs.** This process conducted with the help of ‘Software Requirement Specification’ document also known as **‘SRS’ document.** **It includes everything which should be designed and developed during the project life cycle.**

**There are mainly five types of feasibilities checks:**

* **Economic:**Can we complete the project within the budget or not?
* **Legal:** Can we handle this project as cyber law and other regulatory framework/compliances.
* **Operation feasibility:** Can we create operations which are expected by the client?
* **Technical:** Need to check whether the current computer system can support the software
* **Schedule:** Decide that the project can be completed within the given schedule or not.

**Phase 3: Design**

In this third phase, the system and **software design documents are prepared as per the requirement specification document. This helps define overall system architecture.**

This design phase **serves as input for the next phase of the model.**

**There are two kinds of design documents developed in this phase:**

* High-Level Design (HLD) – overall system design, the overall description/architecture of the application.
* Low-Level Design(LLD) – detailing HLD, component-level design process, It describes detailed description of each and every module.

**Phase 4: Coding**

Once the system design phase is over, the next phase is coding. In this phase, **developers start to build the entire system by writing code using the chosen programming language.** **In the coding phase, tasks are divided into units or modules and assigned to the various developers.** It is the longest phase of the Software Development Life Cycle process.

In this phase, Developer needs to follow certain predefined coding guidelines. They also need to use programming tools like compiler, interpreters, debugger to generate and implement the code.

**Phase 5: Testing**

Once the software is complete, and it is deployed in the testing environment, the testing team starts **testing the functionality of the entire system. This is done to verify that the entire application works according to the customer requirement.**

During this phase, QA and testing team may find some bugs/defects which they communicate to developers. The development team fixes the bug and send back to QA for a re-test. This process continues until the software is bug-free, stable, and working according to the business needs of that system.

QA vs Testing:

QA and Testing are **not** the same concepts – **QA** is **the strategy that encompasses Testing** but much more and involves a much wider set of stakeholders. While **Testing is focused on code quality within a technical arena.**

**Phase 6: Installation/Deployment**

Once the software testing phase is over and **no bugs or errors left in the system** then the final deployment process starts. **Based on the feedback given by the project manager, the final software is released and checked for deployment issues if any.**

**Phase 7: Maintenance**

Once the system is deployed, and **customers start using the developed system,** **following 3 activities occur:**

* **Bug fixing** – bugs are reported because of some scenarios which are not tested at all
* **Upgrade** – Upgrading the application to the newer versions of the Software
* **Enhancement** – Adding some new features into the existing software

The main focus of this SDLC phase is to ensure that needs continue to be met and that the system continues to perform as per the specification mentioned in the first phase.

**Popular SDLC models:**

* Waterfall model in SDLC
* Incremental Model in SDLC
* V-Model in SDLC
* Agile Model in SDLC
* Spiral Model
* Big bang model