

# THE SECRET BEHIND QUALITY SOFTWARE

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**Abstract:** The Software Development Life Cycle (SDLC) is used to create a best and quality software in structured way. SDLC have various phases in order to improve the quality of software project and overall process of software development. We can take a look at pros and cons of SDLC and steps in applying SDLC in web development. In this paper importance and various phases of SDLC will also be discussed.

**Keywords:** Software Development Life Cycle, software development, web development

## 1.Introduction:

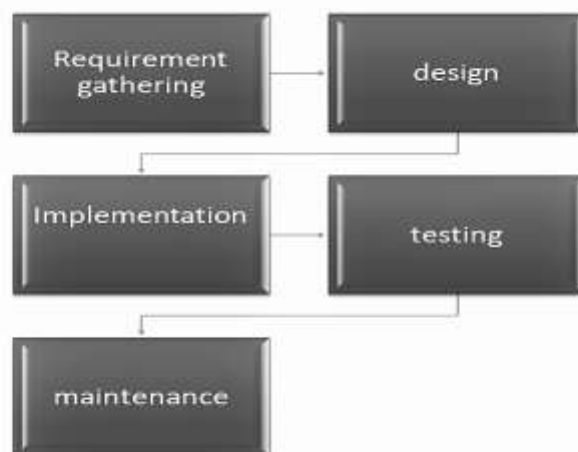
Every software development organization's main motive is to give their best software project to users, so we use software development life cycle in order to design and develop best quality software within the timeframe and budget. It also produces intermediate products that can be reviewed to check whether they work according to customer requirement. So software development life cycle is also known as software development process.

## 2.SDLC and its phases:

The process of software development in India goes through a series of stages in Step by step procedure that almost every company follows which is known as **SDLC**.

Phases in software development life cycle are:

1. Requirement gathering
2. Design
3. Implementation
4. Testing
5. Maintenance



**Fig 1:** Phases in Software Development Life Cycle

## Requirement gathering:

Without perfect planning, aiming for good quality software product is meaningless. This is the fundamental stage (phase) in software development life cycle. In this phase the stakeholder communicates with user to know their ideas and the exact functionality of the software. The requirements of the client are obtained, analyzed, documented and validate by stockholder. If any changes to be made in the software in future purpose, changes are made in requirements analysis document as per the user's requirements.



Fig 2: Functional and Non-Functional Requirements

In the above picture users requirements include both functional and non-functional requirements of the software which is extracted from the client to ensure that software is as per the client needs then it is validated as a SRS document. Requirements specification document serves the purpose of guidelines for the next phase.

### Design:

The next stage of SDLC is design phase. In this phase the tester comes up with the test strategy where they mention what to test and how to test. This phase includes both system design and software design. Here, the system design consists of both software and hardware design in which detailed design is documented. Software design involves design of algorithms and data structures.

In the below picture the SRS document is given as input to the design phase and the output of the design phase is the validated design document.



Fig 3: Design Phase

### Implementation:

After the requirement and design activity is computed, the next phase of the SDLC is implementation. If there exist a good interaction between programmer and designer, outcome of the coding will be effective. This is the longest phase in SDLC because work is divided into modules(units) and coding is started .The programming language to be used and the development tool to be used are decided at this stage. Enough documents have to be embedded in the code for easy understanding and to use for the future purpose. We can also use other projects code in our project which reduces development time.

Developers must be flexible to accept the changes introduced in this phase. In the below picture of implementation phase the input is validated design document and the output is source code in chosen programming language with each of its unit tested.

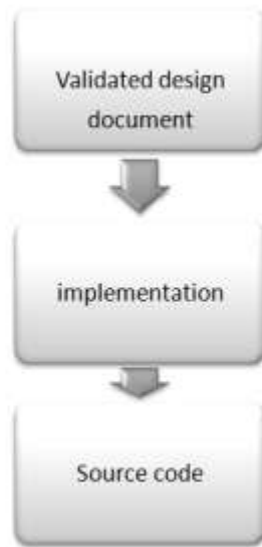


Fig 4: Implementation phase

**Testing:**

Testing is a iterative process to prove that software works correctly .In this phase source code is converted into executable code before testing, the project team develops a test plan. It includes types of testing and how the software will be tested and who should be the tester in each phase. If the defect occurs it is analyzed and the modification is done in source code, till it meets the customer requirements. It takes more time to test because this process is repeated till the source code is defect free. In this phase the both functional testing like integration, unit, system, acceptance testing are done as well as non-functional testing are also done.

In the above picture the source code is given as input and the tested bug free software is output.

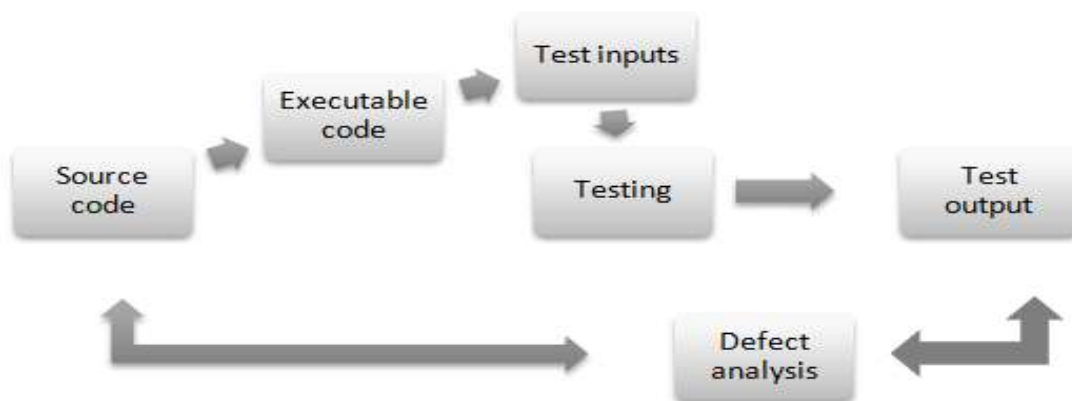


Fig 5: Testing Phase

**Maintenance**

Last phase of SDLC is maintenance phase both software and hardware requires the periodic maintenances. The aim of this phase

is to continue to bring the new system to standards. It involves performing changes, corrections, addition and updates of the system. There is always a maintenance team that looks after post production issues after it is released to the customers.

### 3. Importance of SDLC

SDLC helps us answer a specific need of different users. Now a day's business becomes more dependent on computer software, so we depend on SDLC to develop quality software. It is necessary to use all phases of SDLC to develop bug-free software. It establishes a framework for building, implementing and enhancing a system that all personnel have to follow. It can be used or viewed in the future as everything is documented. Thus SDLC is used as a blueprint in defect-free software development almost in every organization.

### 4. Demonstration of SDLC using web development

SDLC is applied in many real-time applications. For example, we use the internet and visit different websites for various purposes. SDLC can be applied for web pages or website development. Let us now know the factors in SDLC for Web Development. Each factor will have a deep influence in the outcome of the website/webpage and SDLC will carefully outline their roles.

#### Requirement analysis:

This phase gives the answer for "WHAT AND WHY" question and aims to collect the user requirements like project cost, time, inputs and output requirements like function, performance, interface requirements and constraints. Once user data is gathered, the information is presented to developers.

#### Design:

Once the requirement analysis is done by the stakeholder, it is time for web designers to create a design as per the customer needs. This phase gives the detail design (algorithms, data structures) of the website.

#### Implementation:

After coming up with the representation of the website, the next phase is the implementation phase that is to create code. For easy understanding, include the comments lines.

#### Testing:

After coding is done, the next iterative process to prove that software works correctly is testing. The developed website or webpage is tested under various environments. It could also be placed under serious examination by different stakeholders.

#### Maintenance:

After developing the required website or webpage, there is always a maintenance team to take care of the website or web page and also to solve the problems that arise in it. The maintenance team is also responsible for upgrading when needed. Thus the content may be a little bit different in web development but the factors and stages are all the same.

### 5. Pros and cons of SDLC:

The main advantage of SDLC is to develop bug-free best software. Updating software at any stage is acceptable. The time and cost for completion of a project can be predicted. It provides a well-defined road map to develop quality software. Starting and ending points of a project are clearly defined. Errors can be easily rectified. Requirement specification documents enhance the project in the future. SDLC approach ensures project deadline control as each phase depends on the future phase. Create a good relationship between customer and software organizations. And the main disadvantage is cost-effectiveness. The major disadvantage is if any change happens in the mid-way, then the entire document including SRS has to be updated.

#### Conclusion:

The above-mentioned phases play an important role in SDLC. It is applicable to develop any software but the duration and the activity in each phase depend on the model you choose. It is necessary to know all these phases in order to develop quality software. SDLC is used to create both window-based applications and web-based applications.

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