

Research Study on Testing Mantle in SDLC

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Abstract: In the today's fast growing world of modernization and globalization, every client wants the products to be implemented and updated faster than their competitors. Customer want more for software releases with new features to be implemented in short span of time without any defect. Releasing software with so many bugs may affects the user experience which makes bad impact on quality impression. So, testing plays an eminent role in software development life cycle. This paper includes how testing is involved and the mantle of testing in SDLC.

Keywords: software development, software testing, role and importance of testing.

1. INTRODUCTION

Usually software testing is considered as one of the phase of software development life cycle. Software Testing is the process of finding bugs in the software & make the software bug free. In the software development life cycle(SDLC) the testing plays an important role, which helps to improve the quality, reliability & performance of the system with all check, what all functions software supposed to do & also check that Software is not doing what the software not supposed to do. But prior to that, one should know about the various phases involved in the software development process along with testing model.

2. Phases of SDLC along with Testing Model

Software development life cycle is a framework that defines the steps involved in the software at each phase. It covers the detailed plan for building, deploying and maintaining the software. The purpose of SDLC is to deliver a high quality product according to the requirement of a customer. SDLC has defined its phases as requirement gathering, feasible analysis, designing, Coding, Testing, deployment and Maintenance. The necessity is to adhere to the phases in order to provide the product in a systematic manner. If the proper cycle is not followed, then this will lead to failure of the product. **Suppose,** a software has to be developed and a team is divided to work on different modules and is allowed to work as they want. If one of the developers decides to do design first whereas the other decides to do code first and the other on the documentation part. Then, this will lead to project failure because of which it is necessary to have a good knowledge and understanding among the team members to deliver an expected product.

Phase 1: Requirement Analysis and Gathering

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 quality assurance requirements and reorganization 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 finalize the work in necessary

Phase 2: Feasibility study

Once the requirement analysis phase is completed the next 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.

Types of feasibilities checks include:-

Economic: Can we complete the project within the budget or not?

Legal: Can we handle this project as cyber law and other regulatory framework.

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

The system and software design documents are prepared as per the requirement specification document. This design phase serves as input for the next phase of the model.

High-Level Design (HLD)

- Brief description and name of each module.
- Interface relationship and dependencies between modules.
- Database tables identified along with their key elements.
- Complete architecture diagrams along with technology details

Low-Level Design(LLD)

- Functional logic of the modules.
- Database tables, which include type and size.
- Complete detail of the interface.
- Addresses all types of dependency issues.
- Complete input and outputs for every module.

Phase 4: Coding

Once the system design phase is over, the next phase is coding. In this phase, developers start building 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 sends 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.

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, customer start using the developed system using the following three activities:

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

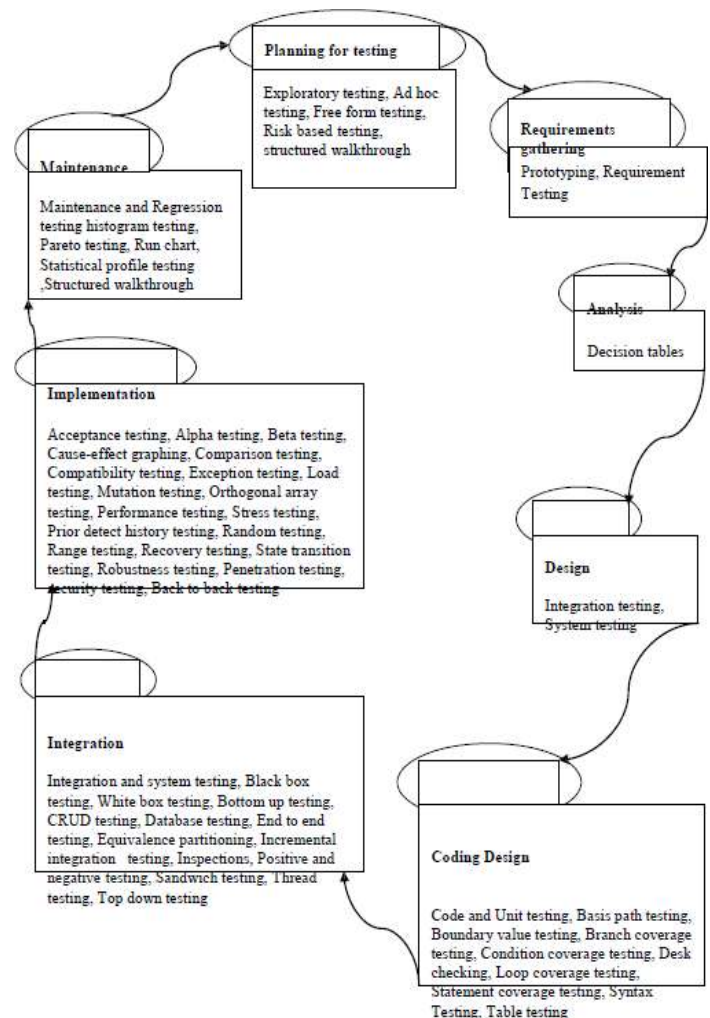


Fig 1: Software testing Model

3. IMPORTANCE OF TESTING IN SDLC

Testing should be introduced in the early stage of the SDLC. The cost of fixing the bug is larger if testing is not done in early stage & bugs found in later stages. It is not possible to make software application defect free but testing will be necessary. In the testing process may not fix the entire defect present in the software application or it we cannot say it as software application is 100% error free & user friendly.

Recognition of Error and Faults

Testing step is one step which resolves the errors and faults in the software application. These errors may be in unit level or in system level. After going through so many testing the application will be free of errors that may be disturbing the application.

Statistics to Shareholders and Status of Organization

Testing stage helps to know the condition of product and work standards. The stakeholders get better data through testing stage about utility value too.

Enhancement in Product Standards

Testing can help to know the real result and the probable result. It also helps to pick up the standards of the software. With proper testing an application can come out of bugs and build up ideal software for the end-users.

Technical Significance

Testing segment is significant for technical characteristics of any SDLC, as the software then completed with technically satisfied.

To Succeed of any Contentious Programmers

Ideal testing functions and tools aid to evolve up the product in business and keep programmers away from the other contestant. Going through all stages of testing, the software application will be more bugs free, protected and technically sound.

Free from any Risk

Whenever going to develop any software, testing is an essential part. When develop software without any testing then it may cause lots of risks to the end users. To free everyone from any risk, it is essential that to go under all testing stages.

Enhanced Standards

Appropriate tested application provides additional assurance of build up with best software. Moreover, it refines standards of application as incessant and all types of testing stages have prepared a protected and harmless software application that could be worn by the end users.

Confirmation and Corroboration

One of the major targets of testing stage in SDLC is for confirmation and corroboration. Testing is greatly used in confirmation and corroboration method. Depending on the result we can compare among standards of several software application.

Credibility Evaluation

Testing stage also insist this important issue. If the software application has gone through all the testing types the application will surely be a reliable one. So, testing evaluate credibility of software application. Testing provides the greatest analytical process to give equipped testing on product ensuing in a credible product.

Demonstrate Accessibility and Feasibility

One of the most significant targets of testing is to demonstrate the product is both accessible and functional. Accessibility testing is where the application is delivering to a select assembly of users and their functioning with the application is noticed.

Avoid Fault Immigration

In the first stage of SDLC, most of the faults have been found. If the faults can be noticed earlier, then these may be prohibited from immigrating to the following progress stage. If the errors could be discover previously then the saving of software development cost will be vast.

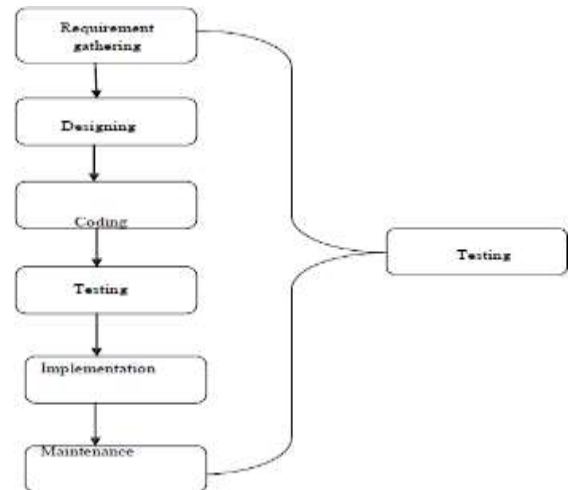


Fig 2: Testing in different Phases

4. SOFTWARE TESTING MANTLE IN SDLC

Inception Phase

In this phase, a test engineer will get an opportunity to identify the necessities of project. Normally the data are recorded by the architecture team in the architectural reference document. Data design, information design, system design are the main issues in this phase.

Elaboration Phase

In this phase, a test engineer will get an opportunity to identify how the project is planned. This is a major phase, where the entire design of the project is documented in the JAD phase in the System requirement document, business requirement document, product requirement document commercial use cases.

Construction Phase

In this phase if any fault or errors are originate then these are test again and it goes through the regression testing. With the help of regression

Transition Phase

In this phase, programmers play an important role of building the application depends on the plan acknowledged during the JAD stage.

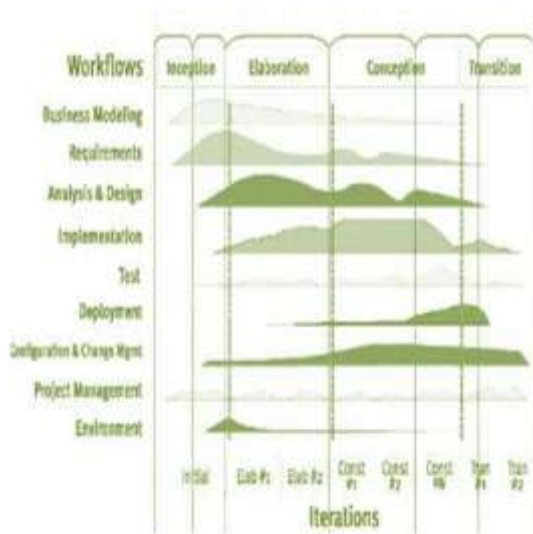


Fig 3: Different Testing Phases

[8]https://www.researchgate.net/publication/331223692_Importance_of_Software_Testing_in_the_Process_of_Software_Development/link/5c6d13464585156b570ae061/download

5. CONCLUSION

Testing has a significant part in SDLC although the testing also upgrades the standards of the software and programmed by recognizing errors prior in the system. It also upgrades the standard of organization. In the today's competitive market only the quality product stays longtime firmly, so to make sure the produce the good quality product the testing of application is key factor in SDLC. Most important thing of testing is the development environment, different than the testing environment and the testing done on testing environment is similar to production environment.

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