

An Infrastructure of Testing Techniques in Juncture of SDLC Model for Software Quality Assurance

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Abstract—Testing of Software is a very important process of dealing with the inaccuracy, and the main motive of examine is to regulate the caliber of the software. Testing is the most innovative approach to make certain the quality of software. In earlier studies a ritual testing phase is to organize in every model of software development but here the purpose of this study is to petition for different testing techniques in all the phases of SDLC model. In customary SDLS models testing is applied only in one phase. If testing is braked down in the ensuing phase than developers obligation to study the previous phases with considerations. So our principal purpose of this proposed study is to explore and explain that how can we choose different testing techniques on the basis of different phases of SDLC models. It is perfectly defined which type of testing technique is more reliable for development of software.

Index Terms— testing skeleton of SDLC, testing techniques of SDLC, SDLC model testing

I. INTRODUCTION

In preceding work we discover that testing is applied in software development life cycle models in a particular testing step, it is difficult to find bugs after competition of requirement analysis, design and coding. So, our main purpose of applying the techniques is to magnify the quality of the software during or after the development of life cycle.

Testing is a very important facet in the development of software. Important purpose of software testing is to provide errors/bugs free software on time and in budget, development which also ensures the life of the software and the good will of the developer. Deficiency may be occur in any stage of the SDLC life cycle, so it is important to fix and detect the bugs, otherwise at the end it will create a serious issues for developers and clients. Early starting of testing in any stage reduces the costs and time as well to error-free software. Testing phase is involved in every SDLC life cycle but here our proposed framework is to apply testing on the all phases of SDLC like requirement elicitation, analysis & designing, coding, integration, implementation and maintenance [1,2], see

Fig. 1. It is recommended that testing of software to be started in the earliest stage. Different SDLC models are Waterfall Model, Incremental Model, Spiral Model, V Model, RAD Model and many more [3].

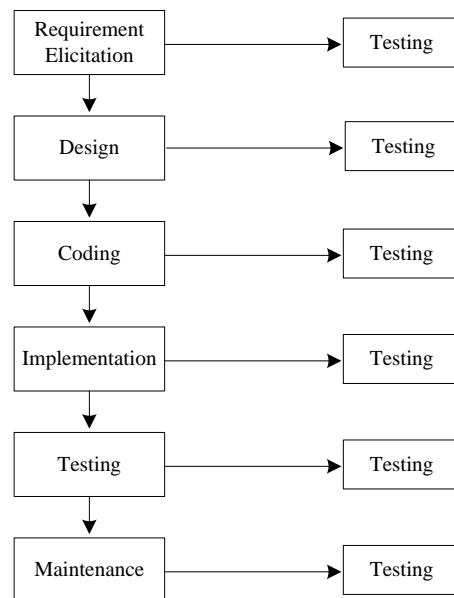


Figure 1. Testing phase in every SDLC life cycle.

A. Background of Testing

Up till 1965 testing of software during development is associated with the debugging or seems alike to the debugging, but during the span 1957 to 1978 there established many evidence which removed the testing from debugging. It is the time when the testing and debugging torn apart. In 1979, Myesr accurately differentiate the testing and debugging, who also gave the theory of testing that it is a processing of removing the errors during the development. From 1988 testing starts as the independent entity in the development of software.

B. Levels of Testing

In software development life cycle testing is involved in every phase. Different kinds of tests levels are available which are mentioned below [4, 5]:

1. unit testing,
2. integration testing,
3. system testing,
4. acceptance testing.

These are the head levels of testing the software modules separately or as the whole. There are various kinds of testing techniques are available which are useable during the development of Software.

II. OVERVIEW OF TESTING TECHNIQUES

A. Functional Testing Techniques

In functional technique we choose test cases on the basis of requirements and the design specification. Normally functional testing is emphasis on the exterior manners of the system.

B. Structural Testing Techniques

In structurally test cases are selected on the basis of implementation mode. Structural testing on significance on the interior of the system. Test cases are sorted out on the fundamental of the implementation. If there is any bug found in stage of the process, test case removes the errors and again checks the whole point to point.

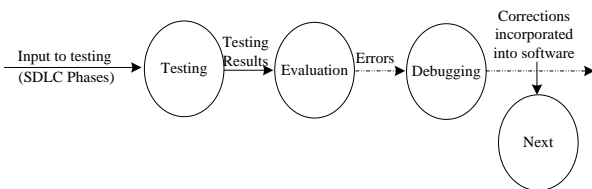


Figure 2. Testing information flow.

C. Proposed Model

The study of the development process of software discloses that in every SDLC life cycle testing phase but in our suggested system testing is applied on every phase to improve the quality of the software and remove bugs after completing of every individual phase. Errors are not only the syntax error of any source code but it may be found in every phase e.g. in requirement elicitation phase, user documentation, error in designing phase etc. So it is important to apply the different testing techniques to gain the optimal benefits from the complete scenario. First of all, over main consideration is to identify testing techniques, which we can apply on the different phases of the SDLC. Software development life cycle consist of 6 phases, as shown in Fig. 1.

D. Software Quality Assurance

To improve the software quality is the main purpose of the developers and software engineering procedure. Software quality assurance is a process that identifies the quality specifications of any type of software.

In this intended study bid for different testing techniques on SDLC mode is heightening the quality of the software. In QA developers perceive that software meets its specifications and features more accurately. Applying the different testing techniques assure the quality of the software.

It is the underlying of any software development techniques. It monitors the quality of software. It is arranged and systematic way to fulfill the standards criteria. If we apply more on testing techniques on the all phases of the SDLC than we independently assure the quality of individual phase rather than after the whole process.

In Requirement elicitation dates are assemble from the stakeholder and various test cases and state are obtained according to the requirements. This testing phase allows the overall structure of the system. In requirement based testing, different testing phases are involved.

III. TECHNIQUES ACCORDING TO THE SDLC PHASES

A. Test Criteria

Test cases are designed according to requirements. In requirement based testing, different testing phases are involved:

- Define the test criteria.
- Test cases are plan according to requirements.
- Execution of the test.
- Verification of the test results.

Trace the errors/bugs remove them and move on to the next phase.

B. Designing phase (Design Analysis Testing)

During the designing phase we can choose the design analysis testing to acquisition and detect the errors and bugs as well. This Process is examined that given solution meets its requirement. If this testing finds any disruption between the requirement and system specification which identifies the wrong choice of design.

C. Coding Phase

Main cause of this phase is to transform the design into the coding. Some errors may occur during the coding due to the deficient programming skills. The main purpose of coding and unit testing are to locate the errors in the code and each individual constituent is tested in unit testing. In unit testing there are two types of testing:

- Static Testing.
- Dynamic Testing.

D. Testing Phase (End-to-End Testing)

Testing put in an application for testing is more innovative pace in SDLC models. End-to-to end is used to examine the flow of process. It is the test of complete construction. Main purpose of this or its behavior is the same like what we expected or not.

E. Implementation Phase (Acceptance Testing)

In obtaining testing software is tested for the acceptance. In acceptance testing system is compliance

with the necessity and requirements of the user. Find whether the system is compatible with the needs of the user or not and if it achieves the requirements then it is accepted to deliver.

F. Maintenance Phase (Walkthrough Testing)

It is a step by awarding of the developed system. This is an informal review process. Different kinds of participants are involved in this testing phase.

- Author: Author presents the step by step products of the system.
- Walkthrough Leader: Leader handled the administrator task completely.
- Recorder: recorder records the whole potential defects.

SDLC phases based testing techniques [6] are listed in Fig. 3.

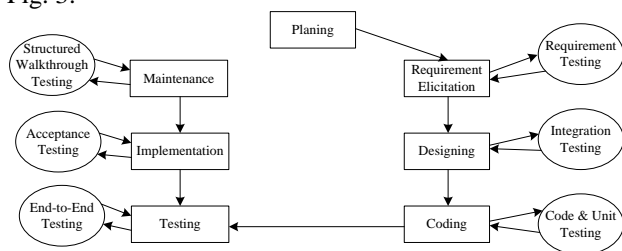


Figure 3. Different testing techniques according to the SDLC phases.

IV. CONCLUSION

Apply different testing techniques increase the quality of the software life. It fulfill the standards of software specification importance. Find errors/bugs is easy in early stage. But on the other hand individually apply the test cases on all phases are a time and budget consuming process. Spend lot of time and budget in testing results the late in software.

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