Bachelor Diploma

Thesis

Faculty of economics and management

Software testing

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Summary

This thesis is conducted the information about the software testing. The study about software development life cycle. How software development process works and what stages are there and how to follow each and everything is conducted by this thesis. Moreover this thesis provide an information about testing step, test design technique, testing types, test estimation process, testing documents, test strategy, testing tools, software development methodology, software deployment, bug life cycle, test automation etc.

The software testing process is one of the most important phase of software development process. In this phase is apply as per model of software development life cycle. There are such like water fall, v model, iterative, spiral and agile. Every model have different type of methodology to develop software. The testing process is the same but phase of testing is different in all software development models. Software testing is process of verification and validation. Software testing follow two types as manual testing and automation testing. Manual testing is done by manually by the tester. Automation testing needs testing tools.

Keywords: Software development life cycle, software development methodology, software development models, test type, test designs technique, test estimation, test levels, test strategy, test tools, test documentation, bug life cycle etc.

Introduction

What is software testing?

The software testing has various definition and views. Testing process is the process of evaluating the software or its component and functionalities with the intention to find whether it specified as per the requirement or not. In other words we can say that testing is validation and verification process of the software. There are few more concepts to define as testing is executing a software or program in order to identify bugs or missing requirement that is different to the actual requirement or additionally we can say that testing is process that need to check system or software is behave or not as it should be. Moreover a process of analysis a program or software to find difference between exiting and required condition and to check the features of program or software. (Michael Dyer, 1992)

Following authors cited above, we can say that Software testing process has main two elements as per below:-

- **Validation**
  Validation is process is to check that program or software will meets and satisfy the specific requirement. In other words software or program should develop as per customer requirement.

- **Verification**
  Verification process is to check that the program or software satisfies the requirements imposed as the start of the development part. In other words the program or software should behave as we want it to.

Fundamental of testing

Software testing is rather than single process. The software testing process starts from gathering information of requirements then need to test first requirements that the given requirement is fully correct and enough. Requirement should have fullness, unique, testable, relational and accessible now it is time to panning of software as per we got requirements. After that need to analyze and design that as per planning. Now need to check for implementation in case we can implement on something after this there will be on next stage is execution. Execution and

evaluating are the final stage of fundamental of testing. So we can divide the fundamental of testing in to following basic stapes as per below.(Müller, Friedenberg, Verma, & Veenendaal, 2007)

Importance of testing:

The software testing is plays vital role in software development life cycle process. There was information mention about survey of software errors cost US economy 0.6 % of gross domestic product and about 80 % of software development costs of project are spent on finding and correction of defects. Usually in testing process product passed through some time more or same phases. So people prefer to early testing to avoid big problem. In test process because of early testing we can know about risk and to face it and prepare for it.

There are different phases in software development life cycle as per below:

1. **Test analysis:** to understand about requirement and need of customer.
2. **Test design:** create test case, scenario, scripts and environment as per customer requirement.
3. **Test execution**: test the test case and reviewed it incases if there are any errors.

Goal of thesis

The software testing thesis's goal is to understand the software development life cycle. This thesis provide information about to develop, test and deployment and quality control of intended software. There are all information about the manual testing. Also in this thesis can help to follow necessary criteria for testing a software as test design technique, test step, test type and test estimation as well as to prepare documentation on testing like test case, test report, bug report and test plan. In the thesis will be included a practical example of test design techniques.

Methodology of thesis

This software testing thesis include the methodology of software development process including all necessary software engineering standards. Which are such as water fall model, spiral model, v-model and iterative model. Moreover this thesis includes information about software test design technique. Also about test step which testing process follow such as unite test, integration test, system test and acceptance test. This thesis provide information about test estimation methods like work breakdown, three point and planning poker. Furthermore this thesis have sample and templates of test document which are test case, test summery reports, bug repot and test plan on examples of all main operating system platforms.

Software development life cycle

Software development life cycle is well designed, structured sequence of stages in software engineering to develop intended software. As per software development life cycle first stage is communication between the client and development team. Then after communication they decided to gather requirement as per client need. After they study and analyze requirement and check that it is relational with our project. Next step is analysis of system. After that design of software as per gather requirement. Further step is codding for development. After this need to test the developed software and integration of software. Next step is implementation of software and after then maintenance in case of need. Last stage is deployment of software. For all this stage in software development life cycle developed different model as per requirement and project.

Software testing levels

Software development life cycle have final phase of whole process is deployment of software to the customer but before we release the software it needs to be undergoes from some testing levels. All the levels should be done in the fix orders. Each testing levels have their own different purpose and importance to software development process. Also some testing levels have sublevel too. But there are major testing levels are only four testing levels which are unit testing, integration testing, system integration testing and acceptance testing. There are

other levels which can be in testing process add according to the testing objectives and prospective of customer.

Test Design Technique

There are different types of design technique are available to test particular kind of testing. Each of them are set for to ensure the particular types of errors or defects. Therefor all test design are classified in to two major types of test design technique Static and dynamic techniques.

Test estimation methods

Estimation

The test estimation method is one the management activity which can help to estimate how long a task or work would take to finished. The test estimation methods are one of the most and important part of test management. In test estimation process need to estimate time, resources, human skills and cost.

Resources are need to finished any task or project. Here in testing they can be people, things, money and facilities etc. time is the main part of the estimation methods as per we need to deliver the software on deadlines. As human skills they can be experience and skill. If there is high skilled and experience staff doing work on project they can finished early than junior and low skilled staff. Cost is the main aspect to develop anything here in testing we can say how much money need to spend to finished particular task.

Test strategy

The test strategy is a detail description of testing approach. The test strategy is most important document which have all answer for testing team how to get done with task. To develop test strategy document very tester develop skill with experience. The possibilities of missing any test activity is low when there is proper test strategy in documented. Test strategy should be discussed with whole team so team knows their responsibility. Test strategy include test approach, test environment, test tools, test plan, risk and issues and test objective.

Bug life cycle

The bug life cycle is define as the set of states bug passes through found to fixation**.** Bug life cycle is deferent for each and every project. Upper image of bug life cycle is cover all the states bug need to go through. (Kaner, Software negligence & testing coverage, 1996)

Conclusion:

This thesis have made an introduction into most important phase of the software development life cycle which is software testing. Software testing has a significant impact to the quality of the software application but sometimes underestimated it. This is why in this thesis, we described necessary criteria for testing a software as test design technique test step, test type and test estimation as well as to prepare documentation on testing like test case, test report, bug report and test plan.

This thesis consisted also a practical part showing an example of various user interface elements testing on the all-important software platforms (e.g Windows, iOS, Unix).

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