

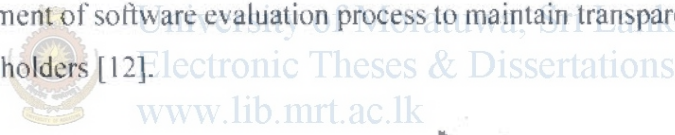
# Evaluation and Testing

### 7.1 Introduction

Before hand over the software to customer it is necessary to check whether customer requirements are satisfied and it is functioning properly without any problems. This chapter is to discuss about software testing and evaluation to check its' performance.

### 7.2 Evaluation of the Proposed System

Software specification requirement have been set to meet the customer requirements and according to that requirements design and development has been done. Then, evaluation of software can be defined as the assessment of software product characteristics according to the Software Requirements Specification (SRS). During a software product evaluation the fit between the software product and the users' needs are determined in practically using the product. This fit concerns both explicit and implicit needs about the product. This is actually part of the quality assurance activity. Normally current users and potential users along with the management are being invited to at the moment of software evaluation process to maintain transparency among all the stake holders [12].



Not all software defects are caused by coding errors. One common source of expensive defects is caused by requirements gaps, e.g., unrecognized requirements that result in errors of omission by the program designer. A common source of requirements gaps is non-functional requirements such as testability, scalability, maintainability, usability, performance, and security.

### 7.3 Software Testing

Software Testing can be defined as, the set of activities that involves Planning and preparation of what to test the software for and executing the software with the intent of finding defects and validating the software against requirements. Testing involves operation of a system or application under controlled conditions and evaluating the results. Controlled conditions would include both normal and abnormal conditions. Software testing is conducted not only to check if the software meets the functional/technical/security requirements but also to break the software with negative

inputs or by incorrect usage. Testing is usually performed to check the improvement of quality and to check verification and validation process. Quality means the conformance to the specified design requirement. Being correct, the minimum requirement of quality, means performing as required under specified circumstances. Testing can serve as metrics. It is heavily used as a tool in the verification and validation process. Testers can make claims based on interpretations of the testing results, whether the product works under certain situations, or it does not work. Also the quality among different products can be compared under the same specification based on results from the same test.

### 7.3.1 Testing Methods

Software testing methods are traditionally divided into black box testing and white box testing. These two approaches are used to describe the point of view that a test engineer takes when designing test cases.

#### 7.3.1.1 Black Box Testing Approach

Black box testing takes an external perspective of the test object to derive test cases. These tests can be functional or non-functional, though usually functional. The test designer selects valid and invalid input and determines the correct output. There is no knowledge of the test object's internal structure.

This method of test design is applicable to all levels of software testing: unit, integration, functional testing, system and acceptance. The higher the level, and hence the bigger and more complex the box, the more one is forced to use black box testing to simplify. While this method can uncover unimplemented parts of the specification, one cannot be sure that all existent paths are tested [13].



Fig : No. 7.1 Black box testing

#### 7.3.1.2 White Box Testing Approach

White box testing uses an internal perspective of the system to design test cases based on internal structure. It requires programming skills to identify all paths through the software. The tester chooses test case inputs to exercise paths through the code and

determines the appropriate outputs. In electrical hardware testing, every node in a circuit may be probed and measured; an example is in-circuit testing (ICT).

While white box testing is applicable at the unit, integration and system levels of the software testing process, it is typically applied to the unit. While it normally tests paths within a unit, it can also test paths between units during integration, and between subsystems during a system level test. Though this method of test design can uncover an overwhelming number of test cases, it might not detect unimplemented parts of the specification or missing requirements, but one can be sure that all paths through the test object are executed.

Typical white box test design techniques include:

- Control flow testing
- Data flow testing [14].

### **7.3.2 Testing of Activity Management and Monitoring System**

To test the proposed system, the Black Box testing approach has been used as it gives final output for given input regardless of internal structure. Use-case, use-Case description, activity diagram, sequence diagram can be used to build the test cases in the case of Black Box testing. In this case activity diagrams are used to build the test cases, because it clearly show interface between user and the system.

#### **7.3.2.1 List of Test Cases**

01. Log-in to the system
02. Add application details
03. Edit application details
04. Delete application details
05. Add project officer details
06. Edit project officer details
07. Delete project officer details
08. Add 'SLS' mark Holder details
09. Edit 'SLS' mark Holder details
10. Delete 'SLS' mark Holder details
11. Add annual fee details
12. Edit annual fee details



13. Delete annual fee details
14. Add quarter audit details.
15. Edit quarter audit details
16. Delete quarter audit details
17. Add auditors details
18. Edit auditors details
19. Delete auditors details
20. Add product details
21. Edit product details
22. Delete product details
23. Print application details
24. Print project officer details
25. Print 'SLS' mark holder details
26. Print annual fee details
27. Print audit details
28. Print audit details
29. Print product details



## 7.4 Test Plan

### 7.4.1 Test Cases

Test Case – Log-in

Table 7.1 - Test Case – Log-in

<b>Test Case ID</b>	1	
<b>Tested Component</b>	Log-in	
<b>Tested Area</b>	Functionality	
<b>Purpose</b>	User can log in with Username and Password	
<b>Prerequisites</b>	User is already existed	
<b>Test Data</b>	Username = {correct, incorrect, empty} Password = {correct, incorrect, empty}	
<b>Test Case Description</b>		
<b>No.</b>	<b>Test Case</b>	<b>Expected output</b>
1	Enter correct Username and correct Password. Then press 'Log in' button.	Load home page
2	Enter correct Username and incorrect	Error message "Incorrect Username"



	Password. Then press 'Log in' button.	or Password." should be displayed
3	Enter incorrect Username and correct Password. Then press 'Log in' button.	Error message "Incorrect Username or Password." should be displayed
4	Enter incorrect Username and incorrect Password. Then press 'Log in' button.	Error message "Incorrect Username or Password." should be displayed
5	Enter empty Username and Password. Then press 'Log in' button.	Error message "Please enter User Name" should be displayed
6	Enter Username and empty Password. Then press 'Log in' button.	Error message "Please enter Password" should be displayed
7	Enter empty Username and empty Password. Then press 'Log in' button.	Error message "Please enter User Name and Password" should be displayed
8	Press 'Reset' button.	Clears the user name and password entry boxes (text areas).

Please refer Appendix F for other Test Cases

### 7.5.2.2 Test Data & Results

Table 7.2 – Test Data & Results of Log-in test Case

<b>Test Case ID</b>		1
<b>Tested Component</b>		Log-in
<b>Tested by</b>		SANATH
<b>Tested Date</b>		2008-10-03
<b>Test System</b>		Windows XP, Intel P(IV), Internet Explorer
<b>No</b>	<b>Test Results Description</b>	
1	Test Case	: Enter correct username and correct password
	Input Specification	: Text, Numeric
	Sample Data	: Username: sanath , password: 123
	Test Result	: Pass
	Remarks	: Correct user identified by the system
2	Test Case	: Enter correct username and incorrect password
	Input Specification	: Text, Numeric
	Sample Data	: Username : sanath , Password: 1234
	Test Result	: Pass
	Remarks	: System does not accept the user
3	Test Case	: Enter incorrect username and correct password

	Input Specification	: Text, Numeric
	Sample Data	: Username : sanathp , Password: 123
	Test Result	: Pass
	Remarks	: System does not accept the user
4	Test Case	: Enter incorrect username and incorrect password
	Input Specification	: Text, Numeric
	Sample Data	: Username : kanchana , Password: 123a
	Test Result	: Pass
	Remarks	: System does not accept the user
5	Test Case	: Enter empty username and password
	Input Specification	: Text, Numeric
	Sample Data	: Username : , Password: 123
	Test Result	: Pass
	Remarks	: System does not accept the user name
6	Test Case	: Enter username and empty password
	Input Specification	: Text, Numeric
	Sample Data	: Username : sanath , Password: 123
	Test Result	: Pass
	Remarks	: System does not accept the user password
7	Test Case	: Enter empty username and empty password
	Input Specification	: Keep blank
	Sample Data	: Username : , Password :
	Test Result	: Pass
	Remarks	: System do not accept the username or password
8	Test Case	: Press 'Reset' button.
	Input Specification	: none
	Sample Data	: none
	Test Result	: Pass
	Remarks	: Clears the user name and password entry boxes .

Please refer Appendix G & H for other Test data and results

## 7.6 Summery

If software project is implemented without evaluation and testing properly, utilizing of software project in effective way will be doubtful. To eliminate that big problem testing was done by using black box testing method. Evaluation was done at each and every necessary stage of the forms and reports.



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