

System Analysis Design

Chapter 8 System Testing



Failure, Bug and Error

Failure: It means the inability of a system or component to perform a required function according to its specification.

Fault/Bug: Fault is a condition that in actual causes a system to produce failure.

Error: Whenever a development team member makes a mistake in any phase of SLC, errors are produced.



System Testing

Testing is the process or activity that checks the functionality and correctness of software according to specified user requirements in order to improve the quality and reliability of system.

□ It is an expensive, time consuming, and critical approach in system development which requires proper planning of overall testing process.

System Testing is a level of the software testing where a complete and integrated software is tested.









Software testing life cycle









Taxonomy of System Tests

Basic tests provide an evidence that the system can be installed, configured and be brought to an operational state.

Functionality tests provide comprehensive testing over the full range of the requirements, within the capabilities of the system.

Robustness tests determine how well the system recovers from various input errors and other failure situations.

□ Inter-operability tests determine whether the system can inter-operate with other third party products.

Performance tests measure the performance characteristics of the system, e.g., throughput and response time, under various conditions.



Taxonomy of System Tests

Scalability tests determine the scaling limits of the system, in terms of user scaling, geographic scaling, and resource scaling.

Stress tests put a system under stress in order to determine the limitations of a system and, when it fails, to determine the manner in which the failure occurs.

Load and Stability tests provide evidence that the system remains stable for a long period of time under full load.

Reliability tests measure the ability of the system to keep operating for a long time without developing failures.

Regression tests determine that the system remains stable as it cycles through the integration of other subsystems and through maintenance tasks.

Documentation tests ensure that the system's user guides are accurate and usable



Rules for System Testing

- Testing should be based on the requirements of user.
- Before writing testing scripts, understand the business logic
- □ should be understood thoroughly.
- Test plan should be done as soon as possible.
- Testing should be done by the third party.
- □ It should be performed on static software.
- Testing should be done for valid and invalid input conditions.
- Testing should be reviewed and examined to reduce the costs.
- Both static and dynamic testing should be conducted on the software.
- Documentation of test cases and test results should be done.



Stages of System Testing

Test Strategy:

It is a statement that provides information about the various levels, methods, tools, and techniques used for testing the system. It should satisfy all the needs of an organization.

Test Plan:

It provides a plan for testing the system and verifies that the system under testing fulfils all the design and functional specifications.



Stages of System Testing

Test Case Design:

Design a test case to determine whether input a(Integer input and range91,100]) is prime or not:

Test Id	Input a(Integer Variable)	Expected Output	Actual Output	
1	100	Not a Prime Number	Not a Prime Number	
2	2	Prime Number	Prime Number	



Stages of System Testing

Test Procedures:

 It consists of the steps that should be followed to execute each of the test cases. These procedures are specified in a separate document called test procedure specification. This document also specifies any special requirements and formats for reporting the result of testing.

Test Result Documentation:

• Test result file contains brief information about the total number of test cases executed, the number of errors, and nature of errors. These results are then assessed against criteria in the test specification to determine the overall outcome of the test.



Dynamic or Basic System Testing

WHAT ARE THE DIFFERENCES BETWEEN BLACK BOX / WHITE BOX / GRAY BOX TESTING ?





White Box Testing

□ White-box testing (also known as clear box testing, glass box testing, transparent box testing, and structural testing) is a method of testing software that tests internal structures or workings of an application, as opposed to its functionality





Black Box Testing

□ In Black Box Testing we just focus on inputs and output of the software system without bothering about internal knowledge of the software program.





Black Box Testing





Grey Box Testing

Gray Box Testing is a technique to test the software product or application with partial knowledge of the internal workings of an application.





Objectives of Quality Assurance

The objectives of conducting quality assurance are as follows:

□ To monitor the software development process and the final software developed.

□ To ensure whether the software project is implementing the standards and procedures set by the management.

□ To notify groups and individuals about the SQA activities and results of these activities.

□ To ensure that the issues, which are not solved within the software are addressed by the upper management.

To identify deficiencies in the product, process, or the standards, and fix them.



Factors that Determine System Quality

Correctness

Reliability

*Efficiency

Usability

Maintainability

Testability

Portability



Manual Testing







Project Name:

Test Case Template

Test Case ID: Fun_10

Test Priority (Low/Medium/High): Med

Module Name: Google login screen

Test Title: Verify login with valid username and password

Description: Test the Google login page

Test Executed by: <Name>

Test Execution date: <Date>

Pre-conditions: User has valid username and password Dependencies:

Step	Test Steps	Test Data	Expected Result	Actual Result	Status	Notes
					(Pass/Fail)	
1	Navigate to login page	User= <u>example@gmail.com</u>	User should be able to login	User is navigated to	Pass	
2	Provide valid username	Password: 1234		dashboard with successful		
3	Provide valid password			login		
4	Click on Login button					

Post-conditions:

User is validated with database and successfully login to account. The account session details are logged in database.



Manual Testing

			Test Case Document							
Project ID: Author of Test Cases Date of Creation:		Project Name: Version No: Date of Release:								
						Cycle #1				
Test Case ID	Req No	Version Number	Type of Test Case	Test Case Name	Action	Expected	Actual	Status	Bug ID	Remarks
TC001					-					
M01 Module Nar	ne									
M01TC001										
	SM01	Sub-Modu	ile Name							
M01SM01TC001										