

System Analysis Design

Chapter 9

System Testing



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Learning Goals

- Failure, Fault/Bug, Error**
- System Testing**
- System Testing Process Steps**
- Types of System Testing**
- Rules of System Testing**
- Test case design**
- White Box testing, Black box testing**
- Factors that Determine System Quality**

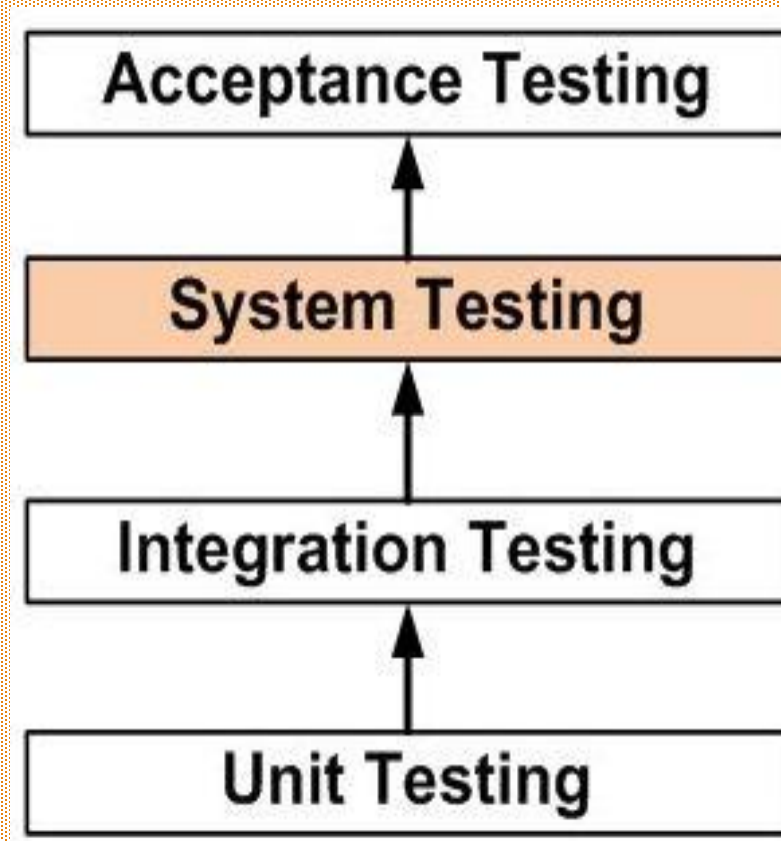
Failure, Bug and Error

- ❑ **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.

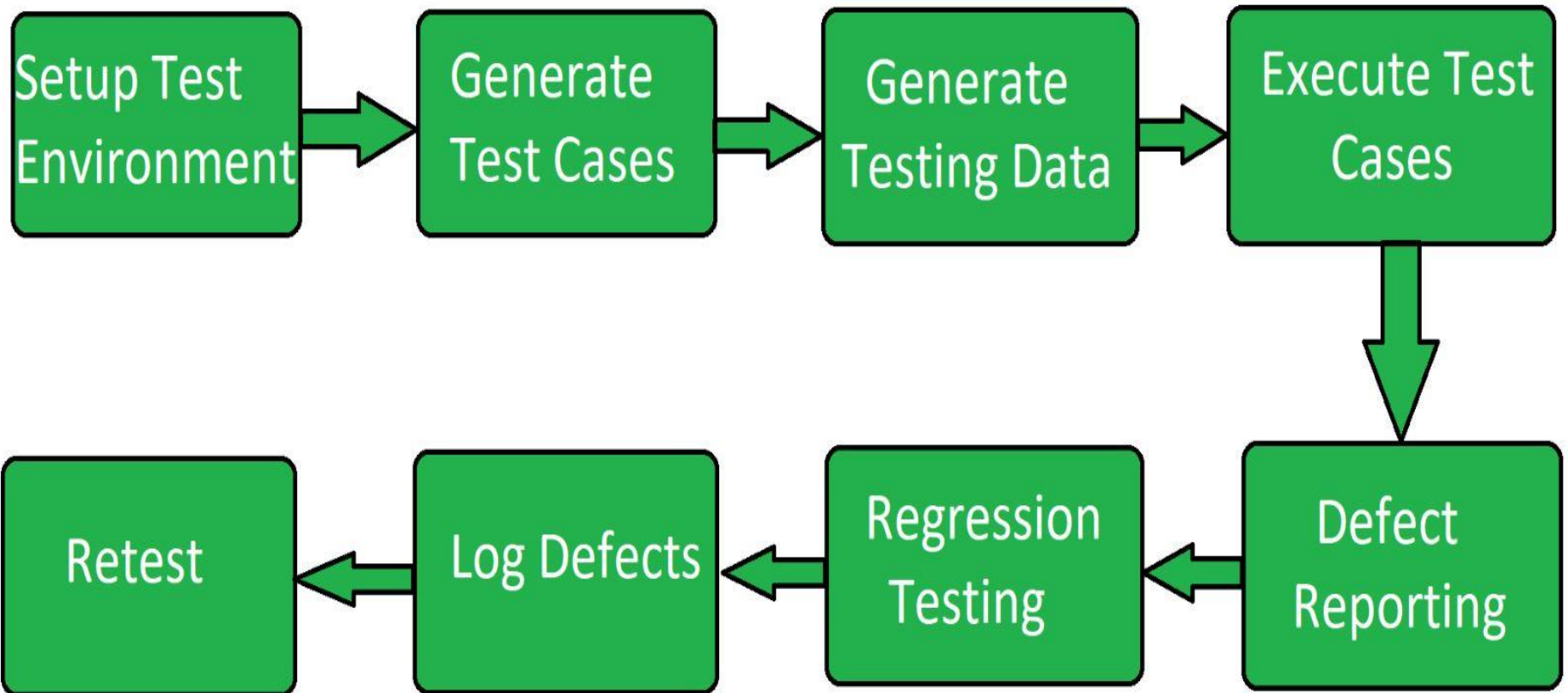
System Testing

- ❑ 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.

System Testing



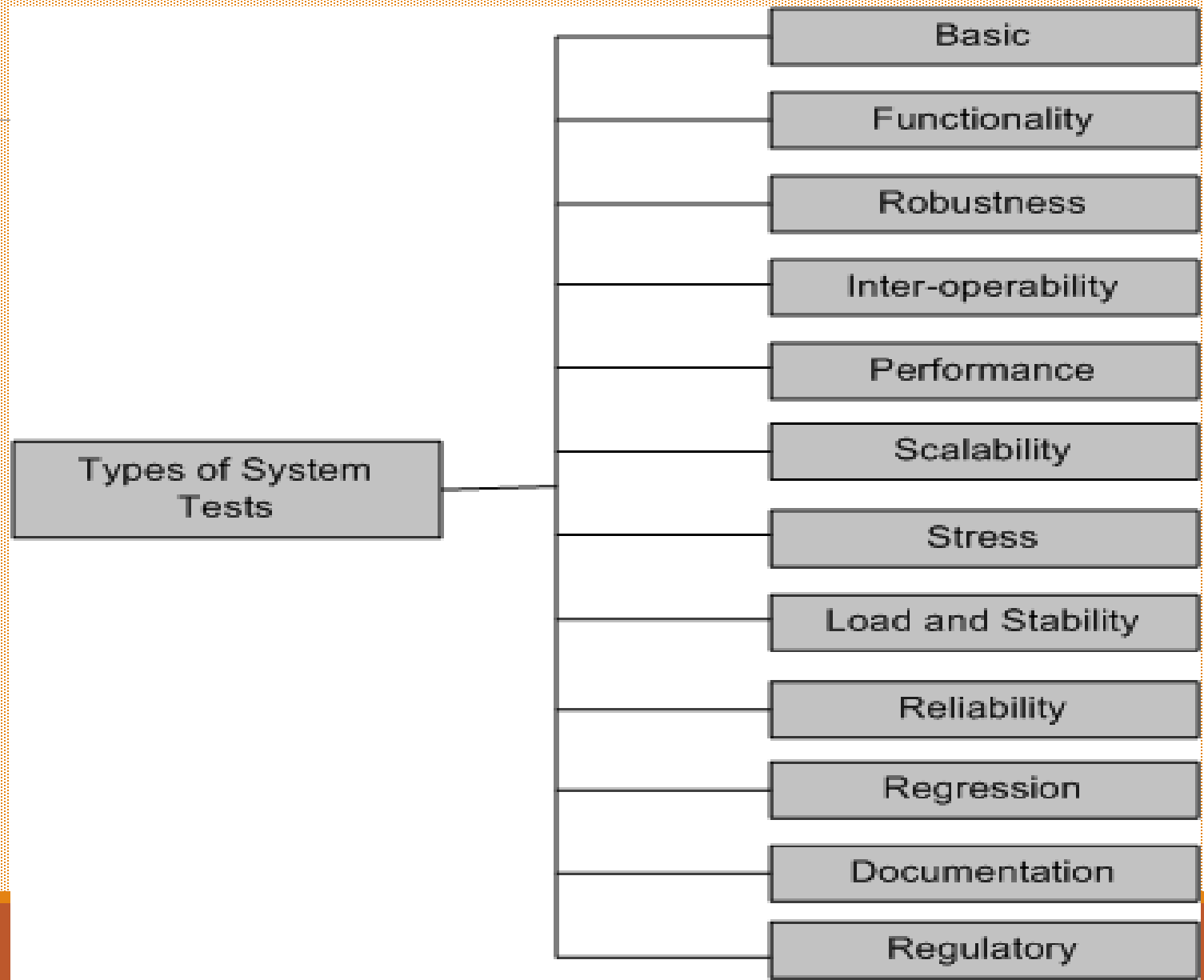
System Testing Process



System Testing Process

- ❑ **Create Test Data:** Generate the data that is to be tested.
- ❑ **Test Environment Setup:** Create testing environment for the better quality testing.
- ❑ **Create Test Case:** Generate test case for the testing process.
- ❑ **Execute Test Case:** After the generation of the test case and the test data, test cases are executed.
- ❑ **Defect Reporting:** Defects in the system are detected.
- ❑ **Regression Testing:** It is carried out to test the side effects of the testing process.
- ❑ **Log Defects:** Defects are fixed in this step.
- ❑ **Retest:** If the test is not successful then again test is performed.

Types of System Tests



Types of System Tests(Cont..)

- ❑ **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.

Types of System Tests(Cont..)

- ❑ **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

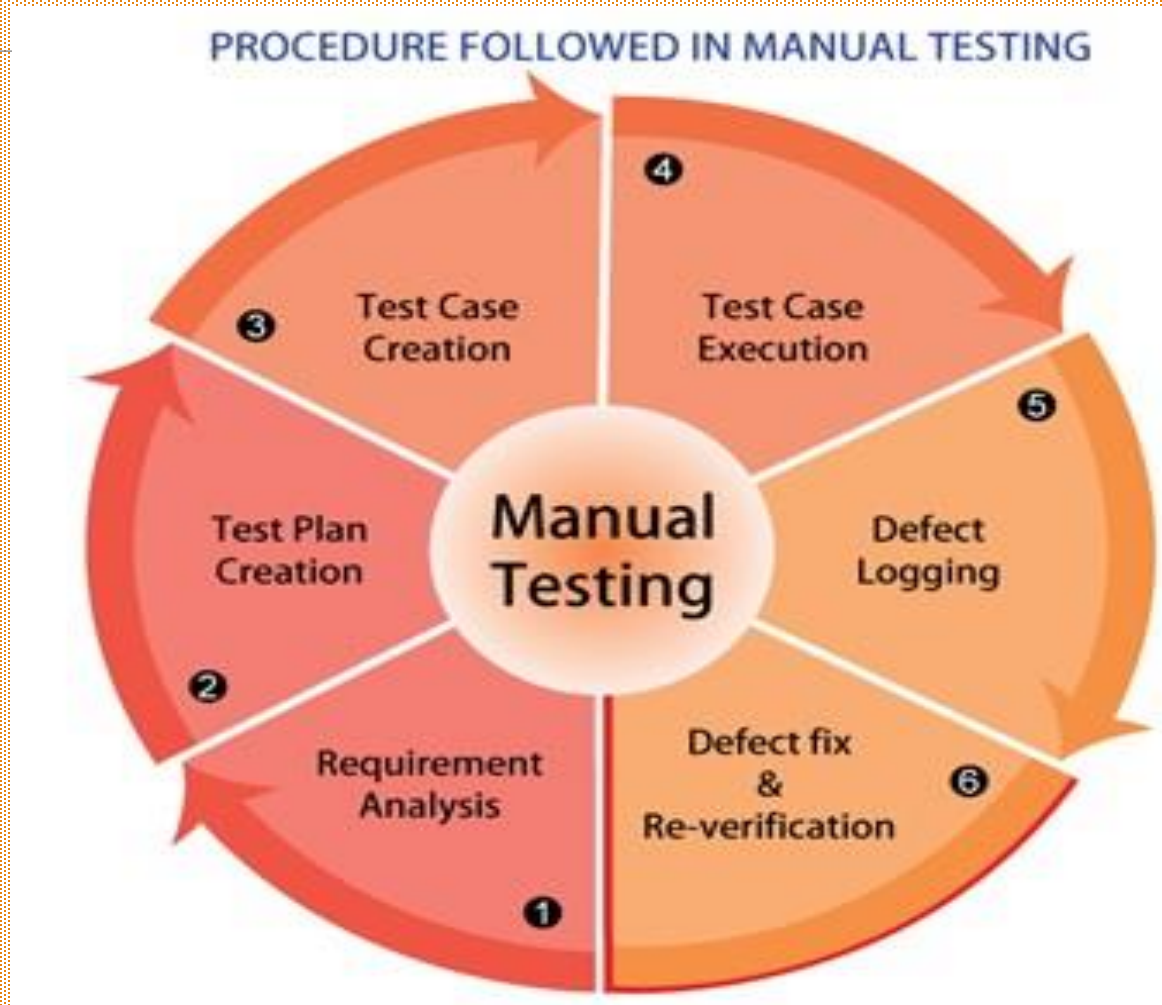
- ❑ Testing should be based on the requirements of user.
- ❑ Before writing testing scripts, understand the business logic
- ❑ should be understood thoroughly.
- ❑ Test plan should be done as soon as possible.
- ❑ Testing should be done by the third party.
- ❑ It should be performed on static software.
- ❑ 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.

Test Case Design

Design a test case to determine whether input a(Integer input and range[91,100]) 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

Manual Testing



Manual Testing

Project Name:

Test Case Template

Test Case ID: Fun_10

Test Priority (Low/Medium/High): Med

Module Name: Google login screen

Test Executed by: <Name>

Test Title: Verify login with valid username and password

Test Execution date: <Date>

Description: Test the Google login page

Pre-conditions: User has valid username and password

Dependencies:

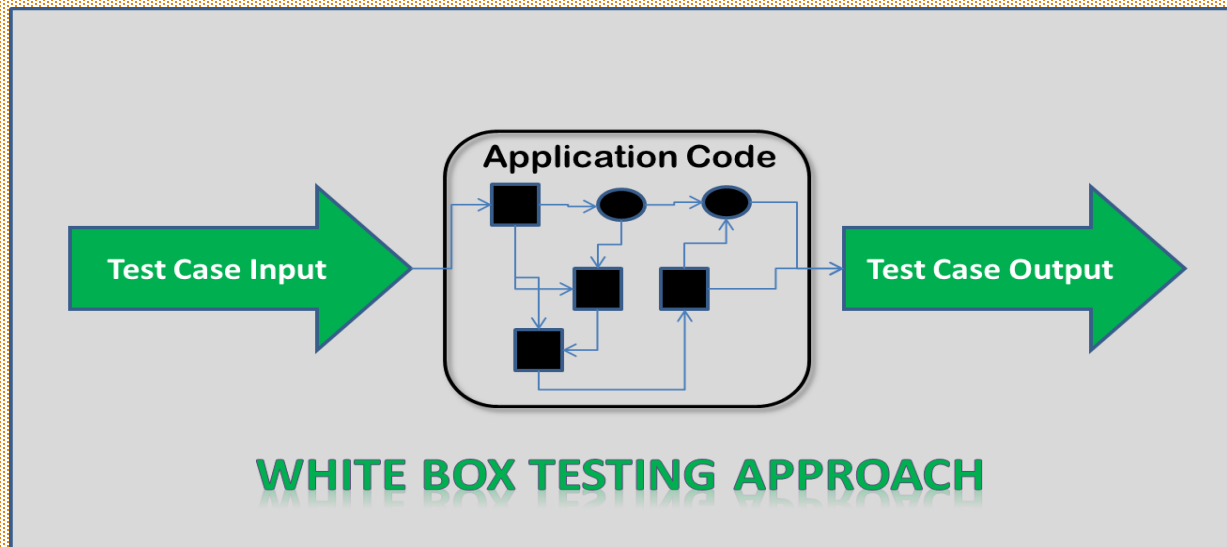
Step	Test Steps	Test Data	Expected Result	Actual Result	Status (Pass/Fail)	Notes
1	Navigate to login page	User= example@gmail.com	User should be able to login	User is navigated to	Pass	
2	Provide valid username	Password: 1234		dashboard with successful		
3	Provide valid password			login		
4	Click on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

Post-conditions:

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

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

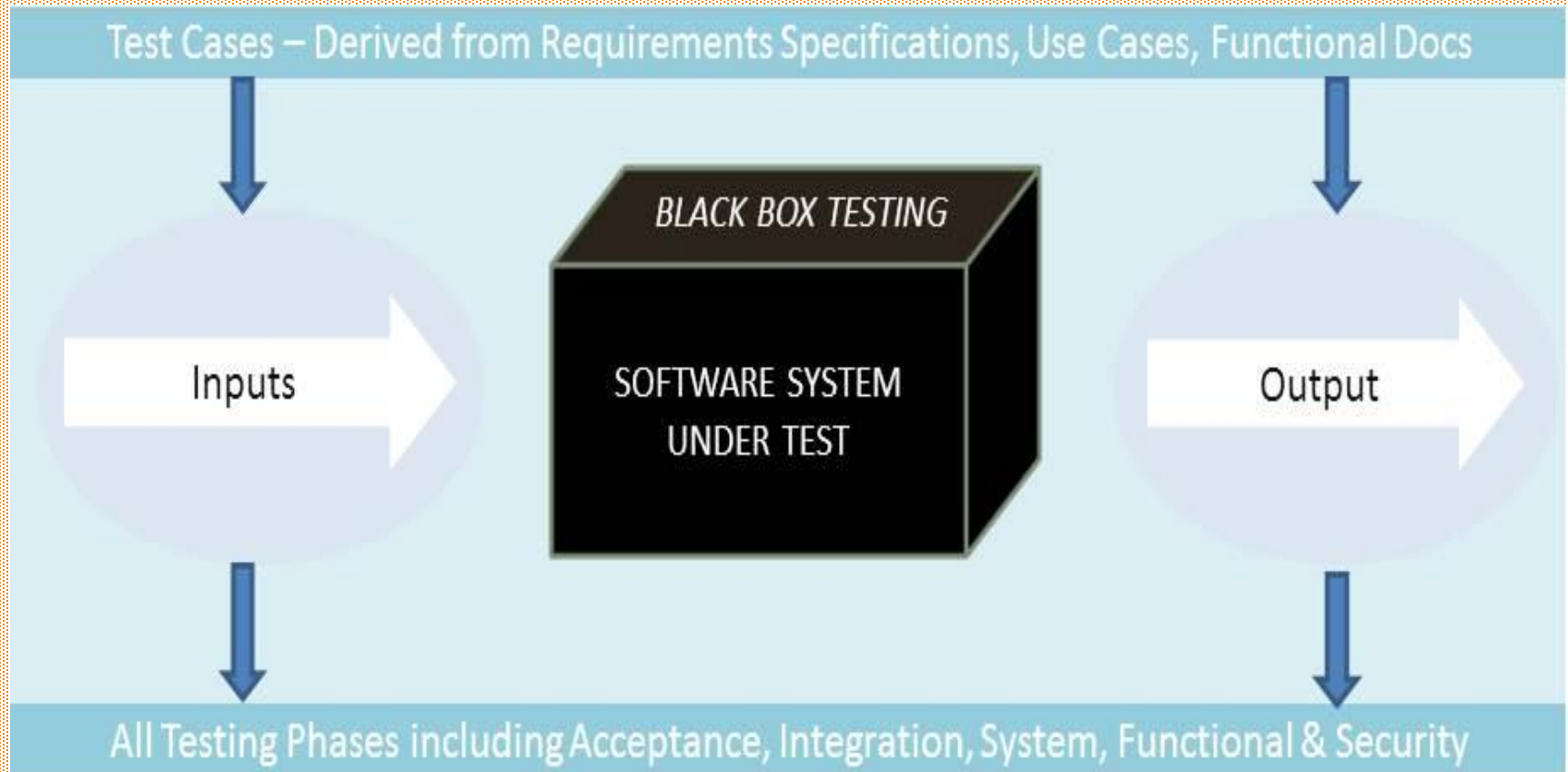


Black Box Testing

- ❑ 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