ĐẠI HỌC ĐÀ NẴNG
TRƯỜNG ĐẠI HỌC CÔNG NGHỆ THÔNG TIN VÀ TRUYỀN THÔNG VIỆT - HÀN
Vietnam - Korea University of Information and Communication Technology

Software Testing

CHAPTER 3. SOFTWARE TESTING APPROACHES AND TECHNIQUES

Session 4

GRAY BOX TESTING AND EXPERIENCE-BASED TECHNIQUES

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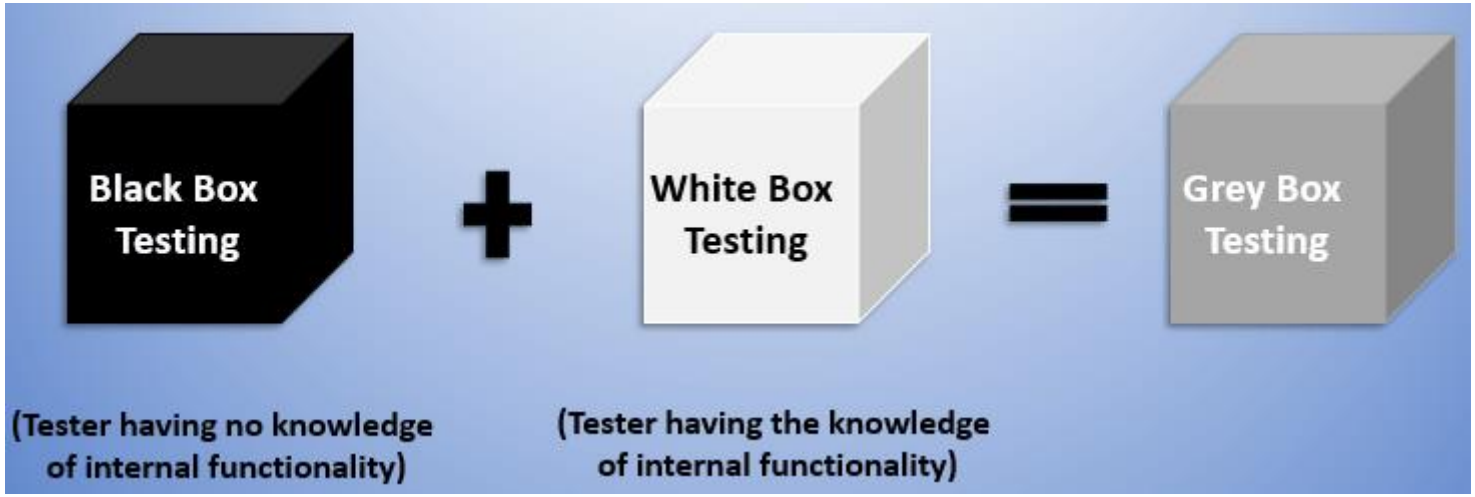
Contents

1.1 What is Gray box testing?

- Is known as Grey box testing or translucent testing
- is a software testing method, which is a combination of both White Box Testing and Black Box Testing method.



- Grey Box Testing is performed on the software product with the partial/ limited information of the internal functionality

1.1 What is Gray box testing?

- By combining white box and black box testing, gray box testing tries to get the best out of the two techniques.
- Gray box testing is an ideal fit for Web-based applications.
- Gray-box testing is the best technique for domain or functional testing

1. 2 Objectives of Gray box testing

❖Gray Box Testing is performed for the following reasons:

- It provides combined benefits of both black box testing and white box testing both
- It combines the input of developers as well as testers and improves overall product quality
- It reduces the overhead of long process of testing functional and non-functional types
- It gives enough free time for a developer to fix defects
- Testing is done from the user point of view rather than a designer point of view

1. 3 Gray box Techniques

- **Matrix Testing**:
  - Examines all the variables in an application.
  - Is used to identify unused or un-optimized variables.
- **Regression Testing:**
  - To verify whether any changes or newly added functionality has not affected the related or previously working
- **Pattern Testing:**
  - valuates past defects to identify patterns that lead to defects.
  - Help to identify and prevent similar defects in new versions
- **Orthogonal Array Testing (OAT)**
  - Is helpful in testing complex functionalities or applications
  - is utilized when maximum coverage of code is required with minimum test cases and has large test data

1.4. Steps To Perform Gray box Testing

- Step 1: Select Input
  - White box and Black box testing inputs to be identified.
- Step 2: Identify Output
  - Outputs to be identified for the inputs selected in step 1.
- Step 3: Identify the Key Paths
  - All the major and key paths to be identified for the testing phase.
- Step 4: Identify Subfunctions
  - Subfunctions to be identified to perform testing at the next level, i.e. to test more in-depth into the product.
- Step 5: Identify Subfunction Input
  - Inputs for subfunction to be identified in this step.

1.4. Steps To Perform Gray box Testing

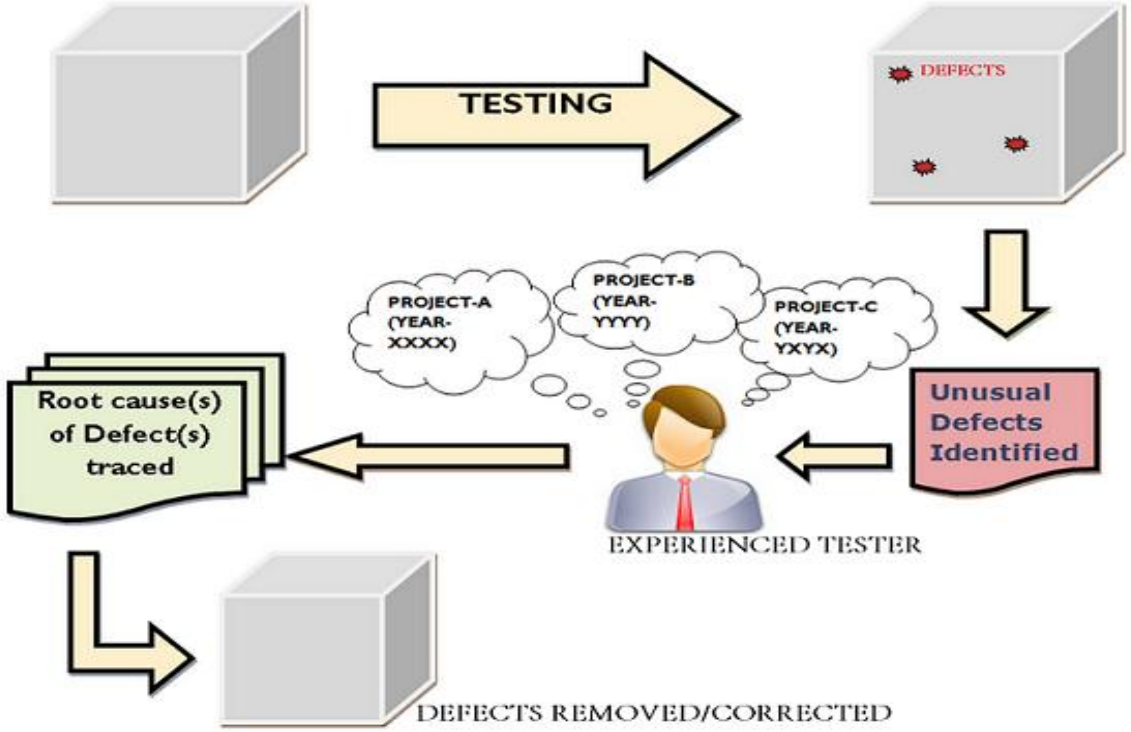
- Step 6: Identify Subfunction Output
  - Outputs to the above-selected input for subfunctions to be selected or identified.
- Step 7: Execution of subfunction
  - Test case for subfunction to be executed.
- Step 8: Verification of executed subfunction
  - Verification to be done for the execution done in Step 7 to identify whether the test results are as expected or not.
- Step 9: Repetition of Step 4 and Step 8
- Step 10: Repetition of Step 7 and Step 8

Gray box Testing Example

- Testing a website form wherein providing email id and submitting the form sends an email to the user for confirmation and information.
  - As a Black box tester:
    - ✓Providing inputs as valid/invalid email ids to check for the system behavior.
  - As a Gray box tester
    - ✓knowledge about the validation, such as email validation will be done using JavaScript on the client-side.
    - ✓test the other scenarios by disabling JavaScript of the browser.

2. Experience-based Techniques

- As known as Ad-Hoc testing
- In experience-based techniques, people's **knowledge**, **skills** and **background** are of prime importance to the test conditions and test cases.



2. Experience-based Techniques

- There are few scenarios where applying the technique:
  - Specifications are inadequate or out of date
  - Time pressure or restricted amount of time to perform testing
  - Limited Knowledge of the Software product.
- Different types of experience based techniques are:
  - Error guessing
  - Exploratory testing

3. Error guessing

- The Error guessing is a technique where the experienced and good testers are encouraged to think of situations in which the software may not be able to cope.
- Requires a lot of experience working with a particular system and so are able to find out its weaknesses.
- It also **saves a lot of time because of the assumptions and guessing made by the experienced testers** to find out the defects

3. Error guessing

- The Error guessing based on:
  - How the application has worked in the past
  - What type of mistakes the developers tend to make
  - Failures that have occurred in the other applications
- The success of Error Guessing technique is absolutely dependent on the skills and experience of the tester.

3. Error guessing

- Typical conditions to try:
  - Division by zero.
  - Blank (or no) input.
  - Empty files and the wrong kind of data (e.g., alphabetic characters where numeric are required).
  - Uploading files exceeding maximum limits.
  - Null pointer exception.
  - Anything that is said can never happen.

4. Exploratory guessing

- Exploratory testing is about exploring, finding out about the software, what it does, what it doesn't do, what works and what doesn't work.
- is used when there is insufficient time and inadequate specifications for testing and
- Tester involves in minimum planning and maximum test execution.
- The software is explored to identify the defects in it based on the testers intuition.

4. Exploratory guessing

- The planning involves the creation of a test document, a short declaration of the scope & a short (1 to 2 hour) time-boxed test effort, the objectives and possible approaches to be used.
- The test design and test execution activities are performed in parallel typically without formally documenting the test conditions, test cases or test scripts. This means informal tests is used.

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Thank You !