Exam Preparation

Course overview

QA
Fundamentals

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www.qualityassuranceteam.com
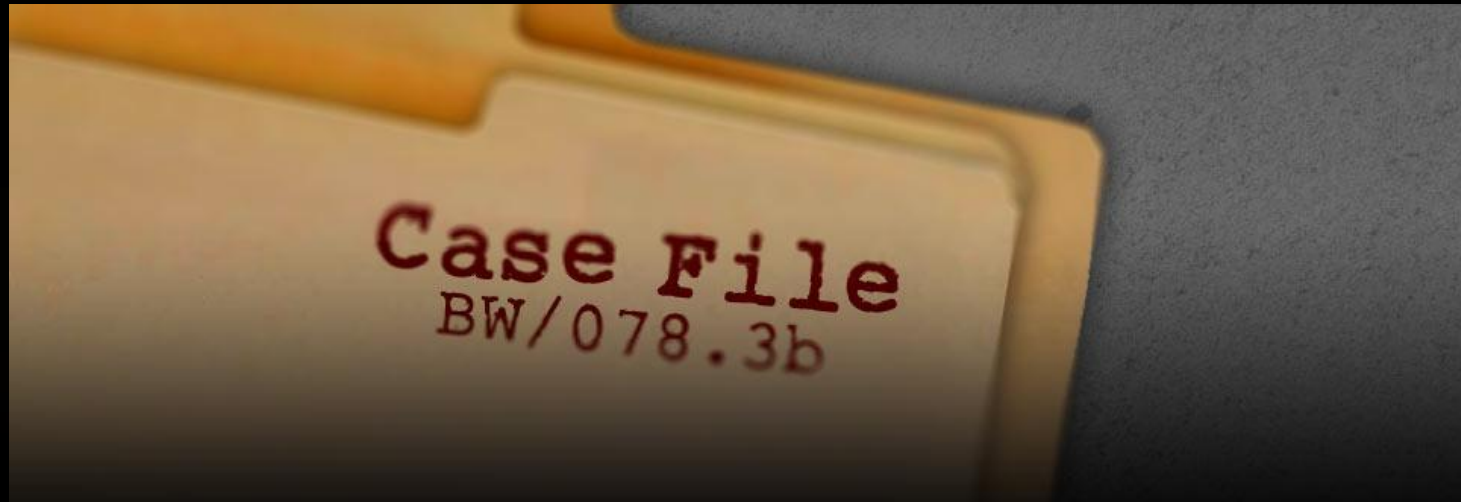
Software University

http://softuni.bg

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1. Test cases and Executions

2. Test design techniques

3. Test levels and types

4. Bug reports

5. Software Development Methodologies

6. Test Automation

Test Case

Test Case

- Sequence of steps to check the correct behavior

- At least two cases to fully test a requirement

  - A positive test

  - A negative test

- Consist of

  - Title

  - Steps to follow

  - Expected result

Test Case (2)

- Optionally may consist of

  - ID

  - Description

  - Related requirements

  - Test category

  - Author

  - Is automated

Test Case (3)

- Example test case

```
TC1: Login with correct username and password
1. Open lab.uk.qualityassuranceteam.com/wp-login
page
2. Enter valid username
3. Enter valid password
4. Click "LogIn" button

Expected Result:
User is successfully logged in the system
```

Test Execution

Test Execution

Test execution is the process of executing the code and comparing the expected and actual results.

- Test execution process factors

  - Test suites to be executed in that cycle

  - Assigning test cases to respective testers

  - Resolve blocking issues as they arise

Testing Techniques

Gray-Box

White-Box

Black-Box

Static
- Informal Reviews
- Walkthroughs
- Technical Reviews
- Inspection

Static Analysis
- Data Flow
- Control Flow

Structure-based
- Statement
- Decision
- Condition
- Multiple Condition

Dynamic

Experience-based
- Error Guessing
- Exploratory Testing

Specification-based
- Equivalence Partitioning
- Boundary Value Analysis
- Decision Tables
- State Transition
- Use case testing
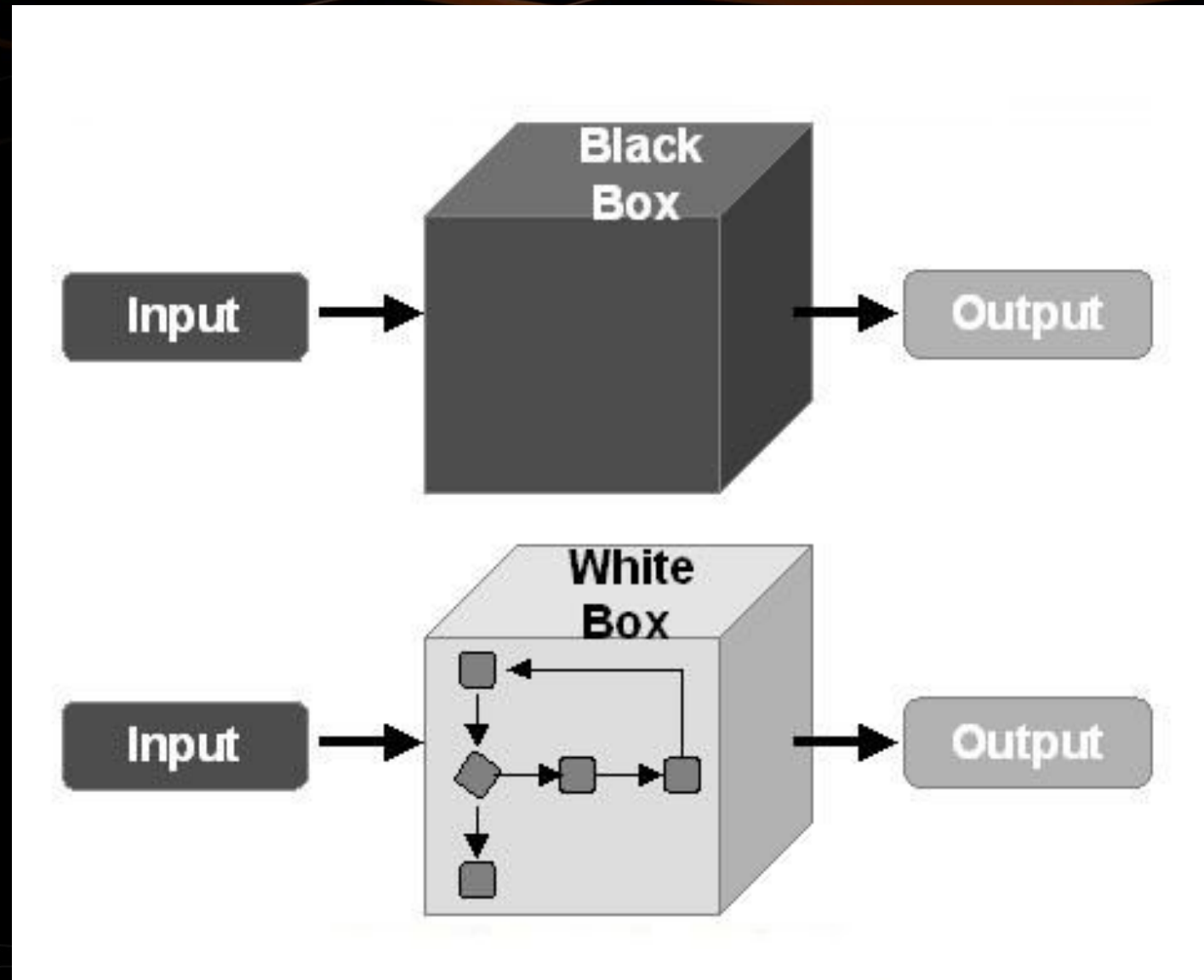
White-Box vs. Black-Box Testing
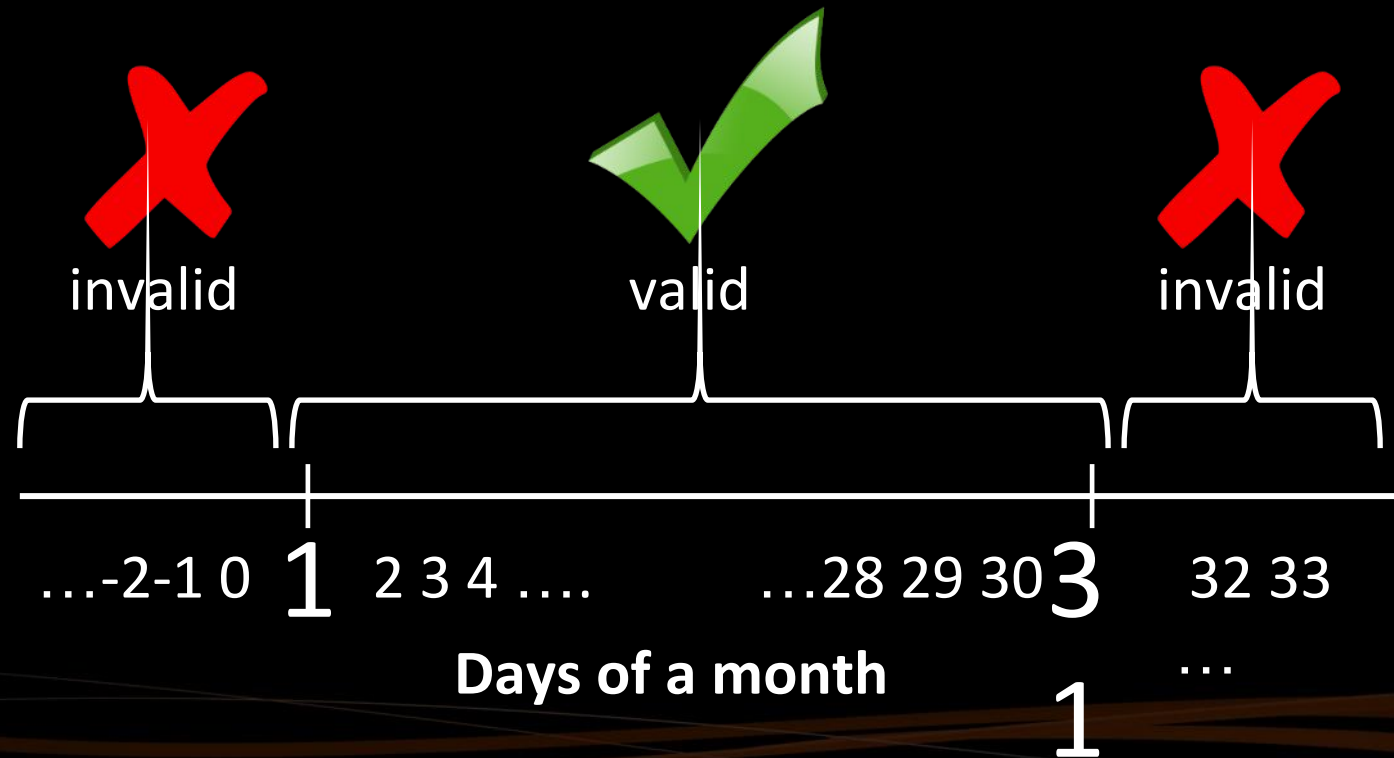
What is Equivalence Partitioning?

- Equivalence partitioning:

> Equivalence partitioning is a software testing technique that divides the input data of a software unit into partitions of equivalent data

- Test cases are designed to cover each partition at least once

What is a Boundary Value?

- The point where the expected behavior of the system changes

- The values could be either input or output ranges of a software component

invalid   valid   invalid

…-2 -1 0 **1** 2 3 4 …. …28 29 30 **3** 32 33
Days of a month **1** …

ACCEPTANCE TESTING

SYSTEM TESTING

INTEGRATION TESTING
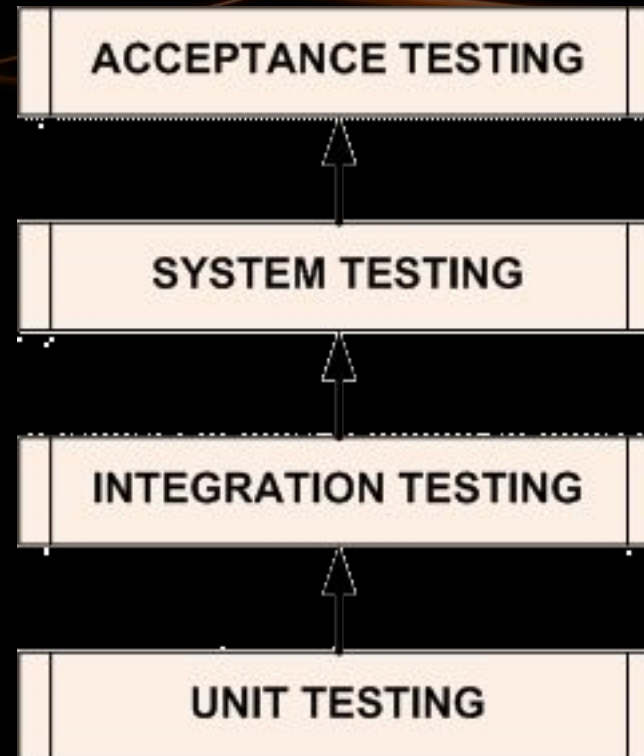
UNIT TESTING

Test Levels

Table of Contents

1. Test Levels
   - Component Testing
   - Integration Testing
   - System Testing
   - Acceptance Testing

THE PROTECTOR
THE THINKER
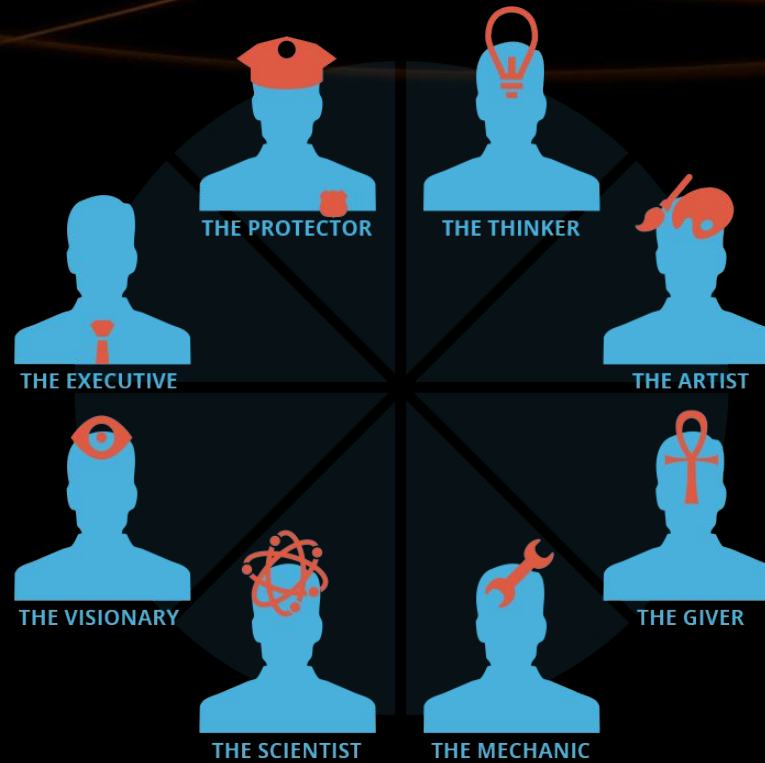THE ARTIST
THE GIVER
THE MECHANIC
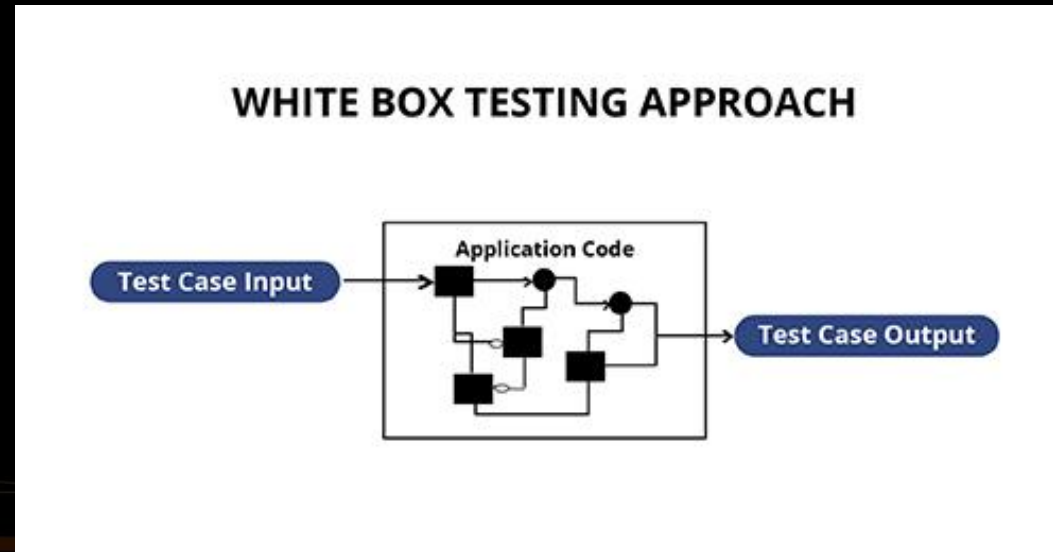THE SCIENTIST
THE VISIONARY
THE EXECUTIVE

Test Types

Structural Testing

- Often referred to as 'white-box' or 'glass-box' testing
- Uses information about the internal code structure or architecture
- Tools can be used to measure the code coverage of elements, such as Statements or Decisions / Branches

Testing Related to Changes

- Re-testing:
  - After a bug has been detected and fixed, the software should be re-tested.
  - To confirm that the original defect has been successfully removed after applying the fix.
  - Also known as Confirmation testing.

Testing Related to Changes (2)

- Regression Testing:
  - Performed after modifications of the code.
  - Testing for newly introduced faults as a result of the changes made to the system.
  - May be performed at all test levels.
- The reason for Regression testing is that changed or new code might affect untouched functionalities.
  - Testing only code, that is changed, is not enough!

Risk-Based Testing

- Prioritization Of Tests Based On Risk And Cost
- Two main types of risk:
  - Product (quality) risks - The primary effect of a potential problem is on the product quality
  - Project (planning) risks - The primary effect is on the project success

Functional Testing

- Functional testing verifies the system's input–output behavior.

- Black box testing methods are used.

- The test cases are based on the functional requirements.

- The main goal is to exercise the functionality and verify the expected behaviour.

Non-Functional Testing

- Testing Non-functional Software Characteristics.
- "How well" the system should carry out its functions.
- Non-functional characteristics:
  - Reliability
  - Usability
  - Accessibility
  - Efficiency
  - Security
  - etc.

Goals of Load Testing

- Load Testing aims to identify the need of improving the applications:
  - Performance
    - Do we need to reduce the time needed to execute a request ?
  - Scalability
    - Can the system handle the anticipated number of concurrent users during peak load in production?
  - Stability
    - Does the application suffer from memory leaks when under load for extended periods of time?

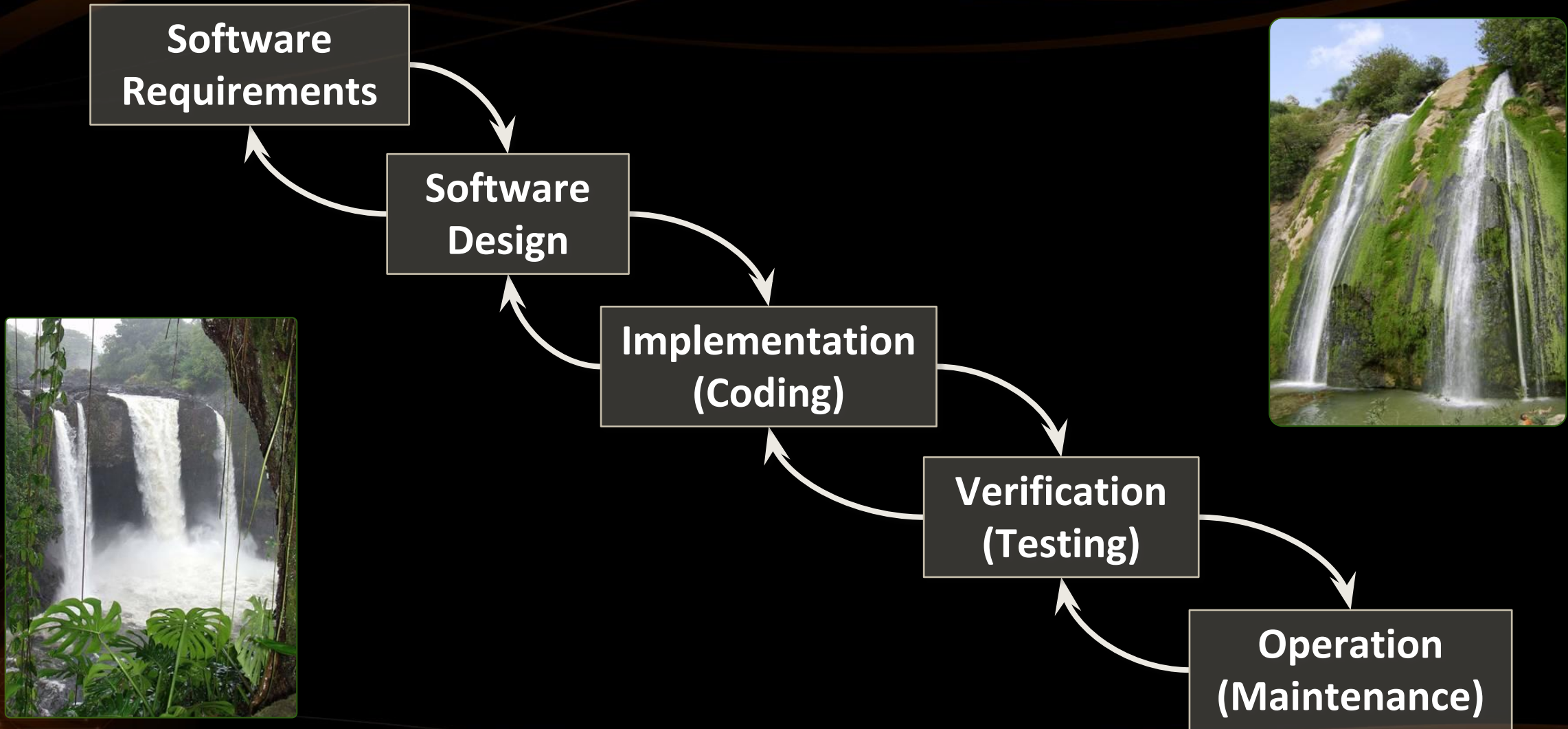# Development Methodologies

Waterfall, Scrum, Lean Development, Kanban, Extreme Programming

The Waterfall Development Process

Software Requirements → Software Design → Implementation (Coding) → Verification (Testing) → Operation (Maintenance)

Scrum

- **Scrum** is an iterative and incremental agile software development methodology for managing product development

  - Very popular in the software industry

- Scrum roles:

  - Scrum Master – maintains the Scrum processes

  - Product Owner – represents the stakeholders

  - Team – a group of about 7 people

    - The team does the actual development: analysis, design, implementation, testing, etc.

Scrum Terminology

- ## Sprint

  - An iteration in Scrum

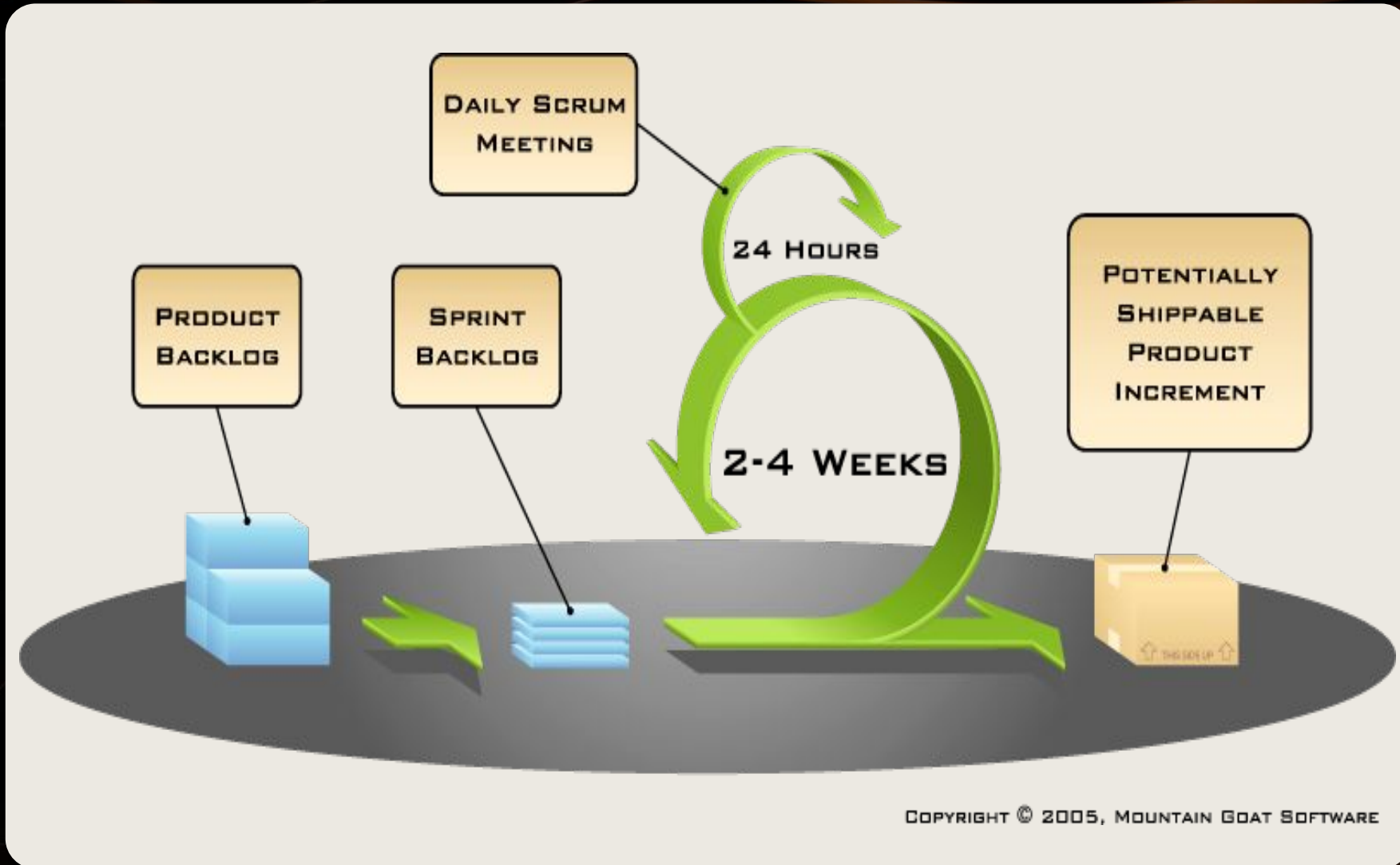 - Usually few weeks

- ## Product Backlog

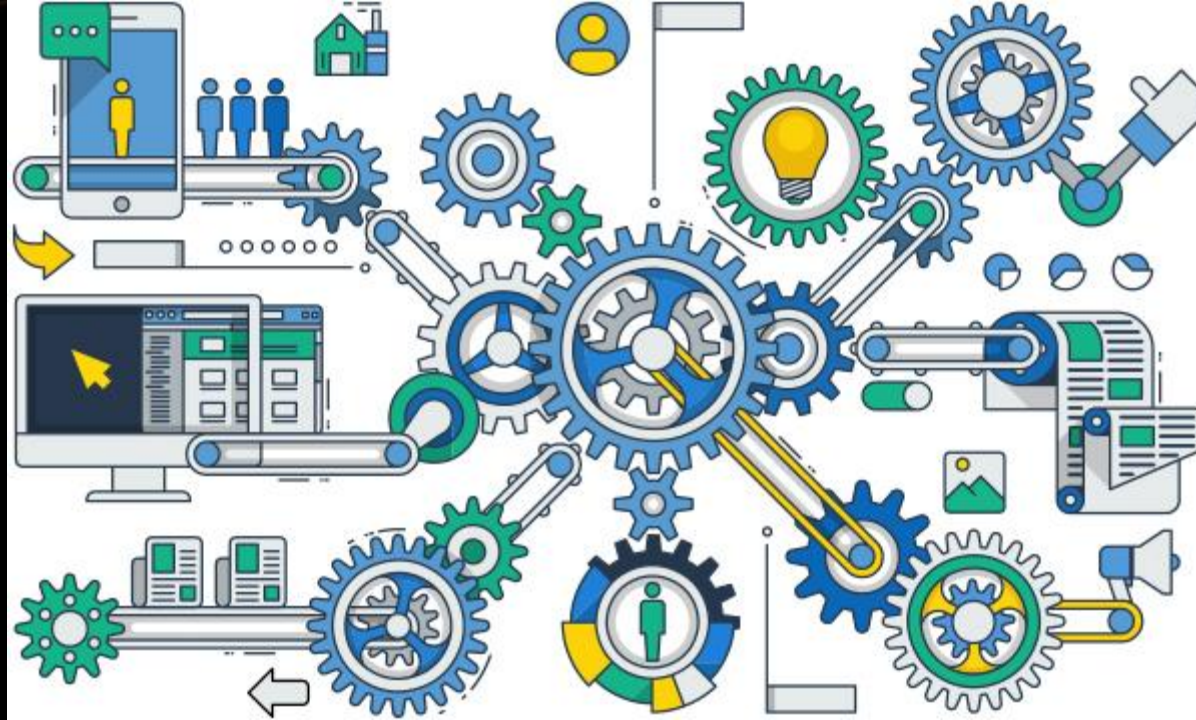 - All features that have to be developed

- ## Sprint Backlog

  - All features planned for the current sprint

The Scrum Process Framework

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Automation

What is Test Automation?

- Executing repetitive but necessary tasks

  - Login, registration, etc…

- Comparing the actual and expected outcomes

  - Checking visual result

  - Checking api responses

- Adding a test to difficult to perform manual actions

  - Big scenario e.g. login the user, then add some products to cart, then check database, then checkout the cart, etc…

What Is Selenium Automation Good For ?

- Selenium can be used for automating:

  - Acceptance / Functional testing

  - Reproducing bugs

  - Regression testing

  - Smoke-testing

  - Sanity-check

Summary

- Test cases and Executions

- Test design techniques

- Test levels and types

- Bug reports

- Software Development Methodologies

- Test Automation

Introduction To Test Automation

SoftUni Foundation

XS software

SmartIT

NETPEAK
SEO and PPC for Business

SUPERHOSTING.BG

INDEAVR
Serving the high achievers

Questions?

telenor

SOFTWARE GROUP

INFRAGISTICS
DESIGN / DEVELOP / EXPERIENCE

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