IBM Software Group

P17 System Testing
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Module 1: Definition and Purpose of Testing

Rational. software

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"Discovery consists of looking at the same thing as everyone else does and thinking something different."

Albert Szent-Gyorrgyi, 1937 Nobel Prize winner in physiology and medicine

Module Objectives

After completing this module, you will be able to:

- Define the purpose of testing
- Describe the core testing activities
- Define testware and provide examples
- Define static and dynamic testing
- Explain how testware relates to the core testing activities

What is Testing Purpose?

The purpose for testing is to *execute or evaluate programs or systems that do the following*:

- Measure the results against the requirements
- Document the difference between the expected and actual results
- Assist in resolving those differences by providing the proper debug aids

Testing Purpose Examples

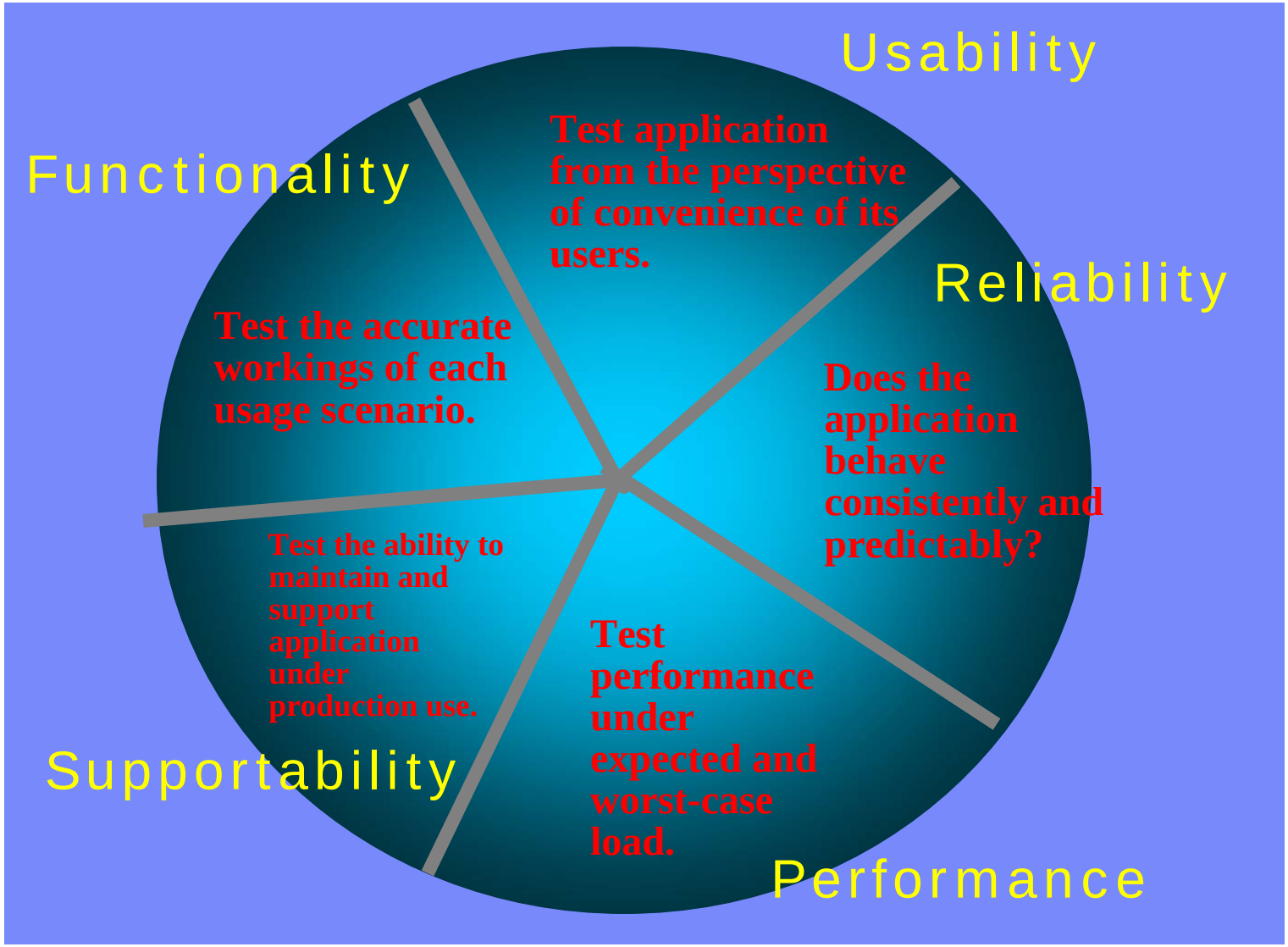
- Uncovering defects and finding important problems
- Assessing quality and risk
- Certifying to standards
- Fulfilling process mandates
- Blocking premature releases
- Minimizing safety-related lawsuit risks
- Minimizing technical support costs
- Maximizing efficiency
- Verifying correctness
- Assessing conformance to specifications or regulations

Testing Focus by Perspective

Based on the role of the person who has a stake in the testing process the focus or purpose of the testing process can vary.

Perspective	Focus
Developer	Testing validates that a program or system conforms to the requirements
Project management	Testing measures whether the deliverable is of high quality
Tester	Testing finds the meaningful errors in the timeframe allocated and verifies that fixes provided for the errors bring the program or system into conformance with the requirements
Corporation or business development	Testing can improve quality and customer satisfaction, reduce costs related to customer service calls and rewrites of software, and improve the profit margin for the business

Testing Dimensions of Quality



Core Testing Activities

Core Activity	Description
Analyze and model	The Tester analyzes the requirements and develops use cases that will verify that the implementation meets the requirements.
Design	Tester refines the use cases into designs based on the architecture and environments using a set of methodologies to help scope the effort.
Implement	The Tester implements the design.
Execute	The test executes the test cases, analyzes the results, reports problems found and drives them to closure, evaluates the software and documents the results.

Types of Testing

Techniques	Description
Static Testing	Looks at the source code without executing it
Dynamic Testing	Testing that requires execution of the code
White-box Testing	Focuses on identifying tests through a deep understanding of the software internals - you read the code to identify test cases.
Black-box Testing	Focuses on testing from a user perspective. -you do not need to understand the internals of the software, but must have a thorough understanding of the requirements and use cases so you can identify test cases

Value of Static Testing

- Perform earlier than dynamic testing
- You can look at the entire design/program and you can consider all use cases at once
- Dynamic only test anticipated variations/errors – Inspection lets you identify missing assumptions as wel

What is Testware?

Testware is the *deliverable* from the testing process. Rational Unified Process (RUP) refers to these deliverables as test artifacts.

It is important to *maintain* testware as it has a life beyond its initial use. Testware is similar to software in that you can reuse it without incurring the cost of development with each use.

As with software, develop testware under *version control* so that it can be maintained and not lost.

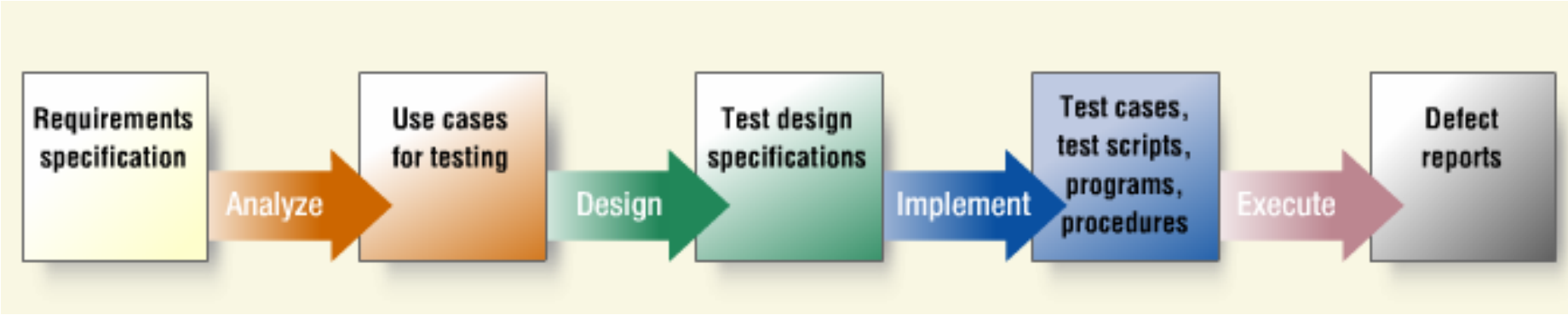
Testware Examples

Testware	Description
Test Plans	Documents that are produced from the activity of test planning.
Use Cases	The results of analyzing requirements
Test Design Specifications	Document the design of the test
Test Cases, Test Scripts and Programs	The results of implementing the test design
Test Procedures	Describe how to execute a test case
Test Data Files	Data results from executing the test cases
Defect Report	Document problems found during execution
Test Status	Document the progress of the testing effort
Final Test Report	Document the final overall results and experience gained from this test effort

Design Reusable Testware

- Modularize your test scripts
- Documented standards for test product usage
- Minimize test scripts with detailed test data

Testware and Core Testing Activities



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IBM Rational Software Modeler

IBM Rational ClearQuest TestManager

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IBM Rational ClearQuest

Module summary

- The purpose of testing is to evaluate products to measure the results against the requirements, document the differences, and help to resolve the differences.
- Core testing activities include analyze and model, design, implement and execute.
- Types of testing techniques include: Static, Dynamic, White-box and Black-box Testing
- The deliverables from the testing process are called testware.
- Testware includes test plans; test cases, test scripts, and programs; test procedures; test data files; defect reports; and test reports.
- It is important to design testware so that it can be reused