TMap

Framework and Importance of
Structured Testing

Lesson Objectives

- What is Testing?
- What is being tested?
- What Testing is not
- Quality
- Quality Characteristics
- Testing of Information Systems
- Testing and Quality Control
- Quality Activities: Measure
- Evaluating and Testing
- Evaluating and Development Process
- Testing and Development Process

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Lesson Objectives

- Test Types
- Test Environments
- Ways of Testing
- Test Levels
- Testing is more than mere execution
- What is cost factor?
- Who is Testing
- Testing Yes! But How?

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2.1 What is Testing?

- Testing is a process that gives insight in and advises on the Quality and the related Risks to this.
  - Aimed at finding defects
  - Aimed at demonstrating lack of quality
  - Aimed at demonstrating the gap between specifications and actual product
  - Aimed at building faith in the end product that gives advise on quality and risk

2.2 What is being tested ?

- Software (Application)
  But also:
  - Hardware
  - System software
  - Procedures
  - Documentation
  - Implementation

- Test object =The to be tested (part of the) information system

2.3 What testing is NOT?

- Implementation
- Acceptance
- Defect repair
- Inexpensive, or is it…?
- A phase after development
- A check on completeness and correctness of functionality
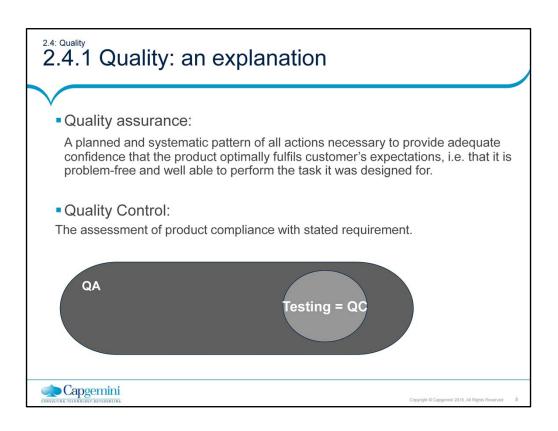- Training for operation and management

2.4 Quality

Quality is the total of characteristics and aspects of a product or service of importance to meet the agreed or logical requirement (ISO 8402)

- Fitness for Use
- Meeting the requirements
- The extent to which the expectations about time and money are met.

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2.4: Quality
2.4.1 Quality: an explanation

- **Quality assurance:**

  A planned and systematic pattern of all actions necessary to provide adequate confidence that the product optimally fulfils customer's expectations, i.e. that it is problem-free and well able to perform the task it was designed for.

- **Quality Control:**

  The assessment of product compliance with stated requirement.

QA

Testing = QC

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2.5 Quality Characteristics

A quality characteristic describes the aspects of an information system

- Effectivity
- Security
- Manageability
- Connectivity
- Continuity
- Data Controllability
- Flexibility
- Functionality
- User-Friendliness

- Reusability
- (Suitability of) Infrastructure
- Suitability
- Maintainability
- Performance
- Portability
- Testability
- Efficiency

2.6 Testing of Information Systems

- Application Software
- Hardware
- System Software
- Procedures
- Documentation

- Functionality
- Continuity
- Performance
- Usability
- Testability

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2.7 Testing and Quality Control

Preventing is better than cure…
… But not all can be prevented!

- Prevention?
- Recovery?
- Detection?

2.8 Quality Activities: Measure

- Prevention:
  - Methods, Techniques, Tools, Standards, Maintenance, Metrics,….
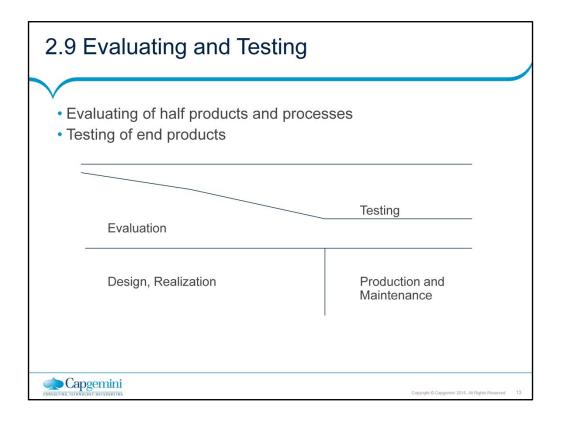 - Arrange organization, select resource
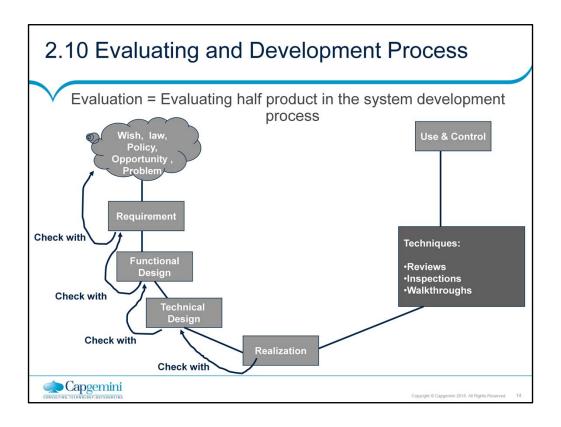 - Training, Coaching, ……

- Detection:
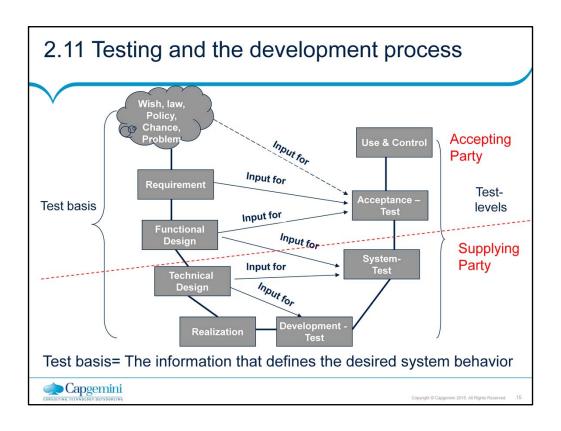 - Checking (of half products)
  - Testing (of end products)

- Recovery:
  - Fixed to requirements, functional designs, technical designs, software, business processes
  - Rearrange organization, maintenance and procedures

2.9 Evaluating and Testing

- Evaluating of half products and processes
- Testing of end products

Testing

Evaluation

Design, Realization

Production and
Maintenance

2.11 Testing and the development process

Test basis= The information that defines the desired system behavior

2.12 Test Types

A test type of a group of test activities with the intention to check the Information system on a number of cohesive (aspects of) quality characteristics

Examples:
• Functionality Test
• End-to-End Test
• Load- and stress test
• Usability Test
• Hackers test
• Regression Test

A regression test aims to check that all parts of a system that are not altered still function in the correct manner after a change has been implemented

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2.13 Test Environments

- "Laboratory" or "Dev" Environment
  - Unit Test
  - Integration Test
  Product meets Technical specs.
- System Test Environment (Semi- Production like)
  - System Test
  - (Performance Test)
  Product meets functional & non functional specs and technical design
- Acceptance Test Environment (Production-like)
  - User Acceptance Test
  - Production Acceptance Test
  - (Performance Test)
  Product meets expectations

2.14 Ways of Testing

- **Dynamic Explicit**
  - Explicitly designed test cases

- **Dynamic Implicit**
  - During execution of other (explicit) testing
  - Not explicitly designed test-cases

- **Static**
  - Checking software without execution
  - Inspection of documentation

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2.15 Test Levels

A test level is a group of test activities that are executed and managed together

Commonly used test levels:
- Unit Test (UT)
- Unit Integration Test (UIT)   Development Tests
- System Test (ST)
- System Integration Test (SIT)
- Functional Acceptance Test (FAT)   System / acceptance Test
- User Acceptance Test (UAT)
- Production Acceptance Test (PAT)

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2.15: Test Levels
2.15.1 What test levels are to be executed?

- Depends on Strategy – determined by project team, facilitated by test coordinator
- Written down in Master Test Plan
- Always dependent on risk !!

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2.16 Testing is more than execution

- Measuring (40%)
- Preparing (40%)
- Planning (20%)

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2.17 What is the cost factor?

In general about 50% of the system development budget is spend on testing

- 10-15% Development Tests
- 25 % System Test / Functional Acceptance Test
- 10-15% user- and Production Acceptance Test\

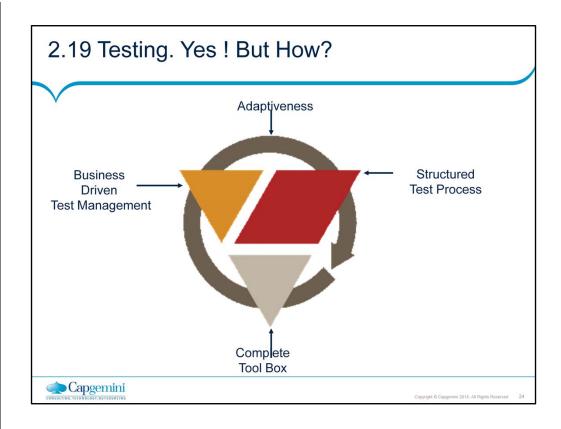More with safety-critical, maintenance, etc.
Less with 'No Risk' Systems

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2.18 Who is Testing?

- Developers
- Users
- Controllers
- And
- (Professional) Testers

But …
- Developers and users:
    - Want to show that the application is working
- Tester:
    - Wants to show that the application is NOT working

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Summary

- The concepts of testing
- Quality
- Evaluating and Testing
- Evaluating and Development Process
- Testing and Development Process
- Test Levels
- Test Environment
- Cost factor of testing

Summary

Add the notes here.

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Additional Reading

- Framework and importance of testing
- URL
  - https://capgemini.sumtotalsystems.com/sumtotal/app/sys_error.aspx?mode=accessdenied&UserMode=0&ru=/sumtotal/core/activitydetails/ViewActivityDetails/120358%3factId%3d120358%26UserMode%3d0%26Task%3d%26InvoiceId%3d%26UserAction%3d%26CallerURL%3d

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