Test education for University and University of Applied Science, an update

Jos van Rooyen
Introduction

• Deployed at Bartosz ICT BV
• >20 years in testing
• Co-author TestGrip, TestFrame, Project de Baas, Quality Supervision, Textbook testing for universities of applied science (in press)
• Test expert online magazine Computable
• Publication areas; Testproces Improvement, BI-testing, Testautomation, test education, quality supervision
• Review committee Valid2014
• Review committee Eurostar 2014
• Founder of the “Houten groep”
• Member of several working parties Dutch Testing Society:
  • Model Based Testen
  • Test education for University and University of Applied Science
Interpretation of the problem

There are several reasons to start working on this topic;

• Company’s depends on IT
• Software glitches still increases
• The complexity of the IT is increasing. Test must increase the quality level to stay in line
• New development methods like Agile requires other skills
• Test must become more professional
The working party has defined 4 goals:

- Inventory of the current situation in the Netherlands
- Is there a need for a new study?
- Defining a curriculum for the new study
- Implementation of the new study?
The status in 2013

The status was:

- First part of the inventory finished
- Curriculum in development stage
- Validation already started
- Pr & Marketing, Implementation must be started
Inventory current situation test education in the Netherlands

Respondents:

<table>
<thead>
<tr>
<th>Type of university</th>
<th>Total number</th>
<th>Number of respondents</th>
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</thead>
<tbody>
<tr>
<td>Universities</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td>Universities of applied sciences</td>
<td>29</td>
<td>8</td>
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</table>

Current situation:

<table>
<thead>
<tr>
<th>Subject</th>
<th>Year</th>
<th>Type of University</th>
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</thead>
<tbody>
<tr>
<td>Introduction to testing</td>
<td>X</td>
<td>UAS</td>
</tr>
<tr>
<td>Testing techniques</td>
<td>X</td>
<td>UAS / U</td>
</tr>
<tr>
<td>Test organization</td>
<td>X</td>
<td>UAS</td>
</tr>
<tr>
<td>Test phases</td>
<td>X</td>
<td>UAS</td>
</tr>
<tr>
<td>Review of requirements</td>
<td>X</td>
<td>UAS</td>
</tr>
<tr>
<td>Test execution</td>
<td>X</td>
<td>UAS</td>
</tr>
<tr>
<td>Defect management</td>
<td>X</td>
<td>UAS</td>
</tr>
<tr>
<td>Model based testen</td>
<td>X</td>
<td>UAS / U</td>
</tr>
<tr>
<td>Testing &amp; development methods</td>
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<td>UAS</td>
</tr>
<tr>
<td>Testmethods</td>
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<td>UAS</td>
</tr>
<tr>
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<td>UAS</td>
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<tr>
<td>Development testplan</td>
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<td>UAS</td>
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<tr>
<td>Testtools</td>
<td></td>
<td>U</td>
</tr>
</tbody>
</table>

UAS = University of Applied Science
U = University

Conclusions:
- No. of respondents around 20%
- Mixed picture
- General & common items are educated based on the response
Curriculum based on generic description of the council of the University of Applied Science:

Structure of the curriculum is:
• Based on architecture layers of the E-competence framework
• Following the System Development Life Cycle (=SDLC)
• Spread over 3 maturity levels
• Supported by literature list
# Test education for University and University of Applied Science

## Test & development methodologies

<table>
<thead>
<tr>
<th>Business Processes</th>
<th>Methodology</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requirements analysis</td>
<td>Traceability matrix</td>
<td>Traceability matrix for requirements, ensuring all requirements are covered and tracked throughout the development cycle.</td>
</tr>
<tr>
<td>Design</td>
<td>Use case modeling</td>
<td>Use case modeling to define the system's behavior and interactions with external entities.</td>
</tr>
<tr>
<td>Development</td>
<td>Test-driven development</td>
<td>Test-driven development to ensure code quality and meet functional requirements.</td>
</tr>
<tr>
<td>System Management</td>
<td>Configuration management</td>
<td>Configuration management to ensure consistent and stable system configuration.</td>
</tr>
</tbody>
</table>

## Test & sourcing models

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test plan</td>
<td>Test plan that outlines the test activities, test cases, and the expected outcomes.</td>
</tr>
<tr>
<td>Test environment</td>
<td>Test environment setup, including hardware, software, and network configurations.</td>
</tr>
<tr>
<td>Test strategy</td>
<td>Test strategy that defines the approach and technique for testing.</td>
</tr>
</tbody>
</table>

## Roles in test

- **Testers:** Execute test cases and report defects.
- **Test Leaders:** Oversee the test team and manage test projects.
- **Test Analysts:** Analyze test results and determine the impact of defects.
- **Test Coaches:** Train and mentor testers.

## Test organizations

- **Test Management:** Responsible for overseeing the overall test strategy and ensuring all tests are executed effectively.
- **Test Leadership:** Provides guidance and support to the test team.
- **Test Execution:** Performs the actual testing activities.
- **Test Quality Assurance:** Ensures the quality and effectiveness of the test process.

## Phases in the test process

1. **Test Plan:** Establishes the scope, goals, and strategies for testing.
2. **Test Design:** Develops the test cases and test data for execution.
3. **Test Execution:** Implements the test cases and records the results.
4. **Test Analysis:** Analyzes the test results and identifies any issues or defects.
5. **Test Closure:** Documents the test results and debriefs the team on any issues.

## Validation & Verification

- **Validation:** Ensures the product meets the specified requirements.
- **Verification:** Ensures the product meets the expected functionality.

## Properties of a good tester

- **Analytical skills:** The ability to analyze data and identify trends or issues.
- **Communication skills:** The ability to clearly express ideas and findings.
- **Problem-solving:** The ability to identify and solve problems efficiently.
- **Attention to detail:** The ability to注意细节 and ensure accuracy.

## Risk-based testing

- **Risk Identification:** Identifies potential risks associated with the test activities.
- **Risk Analysis:** Evaluates the likelihood and impact of identified risks.
- **Risk Management:** Implements strategies to mitigate or control risks.

## Qualification/Qualification (Technical) qualification

- **Qualification:** The process of determining an individual's ability to perform a specific task.
- **Qualification (Technical):** Technical qualifications related to the test process.

## General

- **Test education:** An integral part of the development process, focusing on continuous improvement and skill development.

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**Author:** Jos van Rooyen, feedback to: jos.van.rooyen@bartosz.nl
The curriculum

Question to the audience:

What is missing?
Discussion about the education:
- Complete new education regarding testing
- Minor
- Specialisation
- Combine it with current curriculum
- Education is not necessary

Marketing is just started:
- Presentations
- Via personal network
- Articles

<table>
<thead>
<tr>
<th>Type</th>
<th>#US</th>
<th>#started</th>
<th>Type</th>
<th>#UAS</th>
<th>#started</th>
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<tbody>
<tr>
<td>U</td>
<td>11</td>
<td>0</td>
<td>UAS</td>
<td>29</td>
<td>4</td>
</tr>
</tbody>
</table>

Two stage approach:
1. Implementation Universities of Applied Science
2. Implementation Universities
Deliverables till now are:

- Curriculum
- Textbook for UAS (press 2015)
- Marketing material:
  - Flyer
  - Banner
- Few implementations running
- Presentations
- Publications
Conclusion

• Continuation of the inventory of current situation by hand of available education plans
• Maintenance of the curriculum scheduled early 2015
• Securing of the curriculum
• Implementation will proceed (main focus):
  • Presentations
  • Articles
  • Personal visits to U/UAS
  • Guest lectures
• First textbook will be published 2015
Questions?

Jos van Rooyen
E-mail: jos.van.rooyen@bartosz.nl
Mobile: +31-612716484
LinkedIn: Jos van Rooyen