Derk-Jan de Grood
Conformance and interoperability testing - a different sport ?

Samenvatting:

Conformance and interoperability testing will guaranty o.a. that
- your bankcard is working in a foreign ATM
- your new passport can be read by the border of your holiday destination
- your new USB gadget actually works
- the medical system that is used on you is actually save
- your service can be integrated without any problems and damage claims

During the presentation I will explain the importance of Conformance and interoperability testing and give examples of branches in which these tests are very important. I will highlight things that will need to be organized differently when setting up these tests. Things to consider are a.o.:
- Being fit for purpose vs. conform specifications
- The selling argument of products that are conform their standard
- The importance of re-useable tests
- The role of test automation and the need for objective test execution
- The one-to-many relation between test environment and test objects; the need for flexible test environments and test data.
- The need to indicate the deviations with the norm vs. helping to find a proper solution; How to be objective and supportive at the same time.

The presentation will link theory with practical examples. The participant will gain insight in a test form that he is less familiar with and might be able to learn some things that could be useful in his own environment.

Biografie:

Derk-Jan de Grood has worked as a tester since 1997. As an ISTQB/ISEB practitioner certified test manager he advises companies in setting up their test projects. Derk-Jan is responsible for coaching test experts. He uses the principles and result driven test philosophy as a daily practice. He is known as a passionate speaker at conferences, lectures and test training sessions. Derk-Jan is the author of TestGoal, the test philosophy by Collis. The book is published in April 2007 (ISBN 9789012118835, SDU/Academic Services) and deals a.o.with testing of conformance and interoperability.

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Conformance & interoperability testing

A different sport?

By: Derk-Jan de Grood
Date: September 2007
Location: NBC Nieuwegein

Leiden   Singapore   Boston   Edinburgh

Announcement

Certificate

Signed, 20 September 2007,
Leiden, the Netherlands

Neighbor of Derk-Jan

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Objectives for this presentation

- The relevance of conformance en interoperability testing in certain branches
- Which parts of the testing process will change with respect to functional testing
- The difference between standards and certifications.

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Experience

Collis has track record in conformance testing:

- Design, realization and maintenance of conformance test environments, e.g.:
  - Gezundheidskarte (Germany),
  - VISA/Mastercard validated test suites for testing payment applications in Conclusion®.
  - CTAP testing for Concurrence.

- Execution of conformance testing, e.g.:
  - ATM test service on behalf of Equence.
  - Smart Card testing for TNO (e.g. ISO-7816,ISO-14443)
  - Interoperability testing for TransLink.

- Auditing/ 2nd opinion or coordination, e.g.:
  - IVERA/ Rijkswaterstaat: Traffic light protocol audit .
  - TNO: EM radiation and immunity test of industrial PC.

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Conformance and Interoperability

Bug report

- "Advise: Change the specifications to the current situation. The implemented function works better than the designed one."

Often true:
Fit for purpose outweighs conformance to the specifications.

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But not always

❖ Certain branches conformance to the norm and guarantied interoperability is crucial.

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Interoperability = the capability of different
programs to exchange data via a common set of
business procedures, use the same file formats and
protocols.

Conformance = The extend in which a process or
system satisfies a standard.
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Example 1: size and compsition

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Example 2: COTS

[Waucomont 2007]-COTS

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Example 3: Data exchange

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Example 4: availabilty

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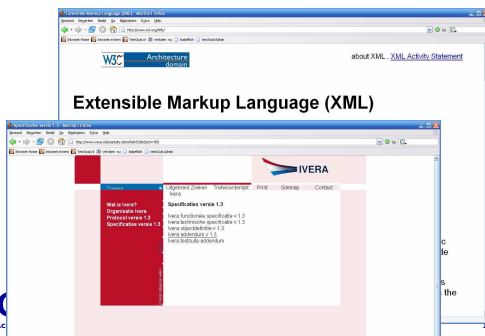
Relevance

❖ Conformance tests are often carried out on infrastructure that exceed the domain of a single organization.

❖ More than one manufacturer deliver systems that work within that infrastructure.

❖ Conformance is required on a interface or on (communication) protocol level.
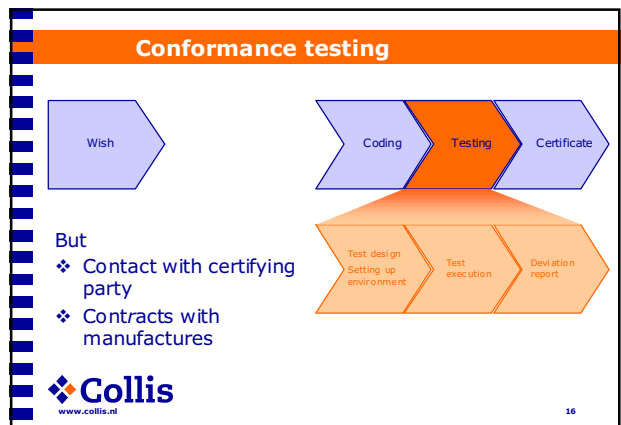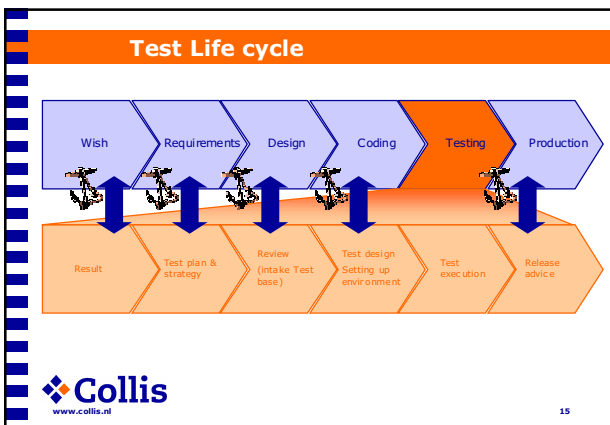
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Testing

❖ If you decide to use a standard, you should also test the conformance to it.

I know functional testing, what's different in conformance testing?

Coverage: Risk based testing or ALL testing ?

Focus on activities

Who's testing the tester ?

And who cares ?

(un) Ambiguity of the test set ?

Test automation

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Test Life cycle

| Wish | Requirements | Design | Coding | Testing | Production |

| Result | Test plan & strategy | Review (intake Test base) | Test design Setting up environment | Test execution | Release advice |

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Conformance testing

| Wish | | Coding | Testing | Certificate |

But
❖ Contact with certifying party
❖ Contracts with manufactures

| Test design Setting up environment | Test execution | Deviation report |

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Trust

Trust in the certificate is created by
❖ Trust in the standard
❖ Trust in the conformance testing ✓

This later implies:
❖ The executed tests have sufficient coverage and are unambiguous
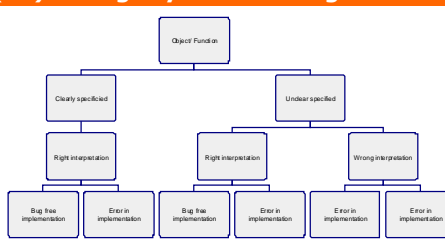❖ The tests are executed in a correct manner and the results represent reality.

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Coverage with standard

		In testdesign	
		Y	N
In standard	Y	✓	✗
	N	✗	?

Risk:
The system contains bugs that will not be found. Specified functions are not tested

Risk:
The system might contain unknown functions of unknown quality and impact with other functions.

Risk:
The system works different than expected. The tests suggest that the system behaves as expected, but the expectation is not specified.

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(un) Ambiguity of test design

Fit for purpose vs Conformity

- Manufacturer: Fit for purpose & Conform all standards
- Certifying party: Conform specific standard and audit the test centre.
- Test centre: All tests passed

Thus manufacturer still needs to test the fit for purpose

Organizing conformance testing

Differences at a glance
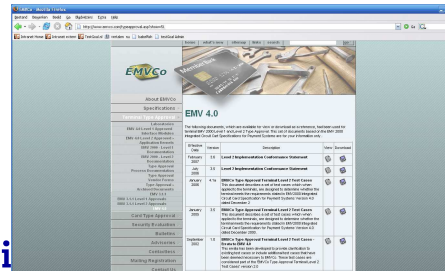
	Functional testing	Conformance Testing
Test basis	Changes often	Stable
Test environment	1-to-1 relation	1-to-n relation
Test design	Made by test team	Often prescribed
Reuse of test design	Limited	Many times
Test automation	Can be useful	Often very useful
Risk Based Testing	Much added value	Limited added value
Bug fix and solution	Involvement	Up to manufacturer
Organization	Often in projects	Often as a service

Stability of the standard

- Unlike many specifications, standards have a high stability.

Reusability

- As said: " More than one manufacturer deliver systems that work within that infrastructure".

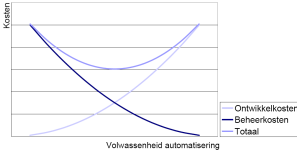- Thus… the tests are being carried out for each model of each manufacturer.

- Expertise of the standards
- Independent test centre

Test automation

- ❖ Business case

Ontwikkel- en beheerkosten

- ❖ Objectivity
- ❖ Technical necessity

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Risk based testing

- ❖ The implementation conformance statement (ICS) tells where to focus on.

- ❖ Test functions that are likely to deviate first.

- ❖ Intake testing.

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Bug fix and solution

- ❖ Deviation report states the differences with the standard.

- ❖ Finding the source of the deviation and determining the solution is responsibility of the manufacturer.

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Certification

Conformance vs. Certification

- ❖ Certification tests are conformance –or interoperability tests that are executed with the purpose of obtaining an conformance statement that also settles the (legal) liability.
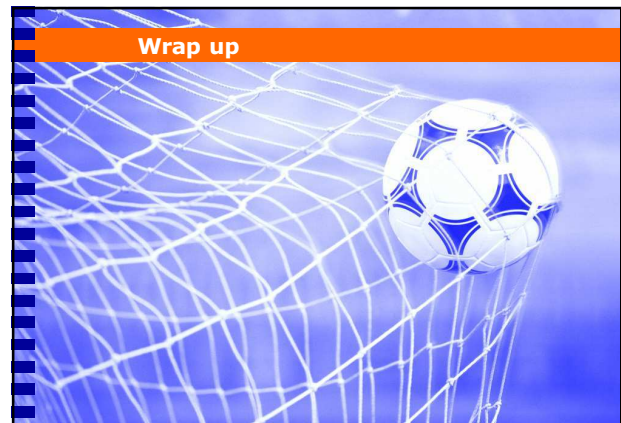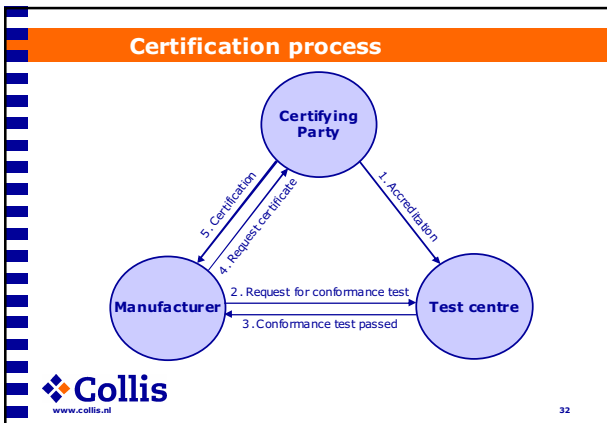
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Any one can give a certificate

- ❖ And some have an added value:

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Certification process

Wrap up

Differences with Functional testing

- ❖ Purpose shifts from 'Fit for purpose' to 'conform the standard'.
- ❖ Risk Based testing has different meaning.
- ❖ Tests are dictated by institute.
- ❖ Tests are reused very often in unaltered form.
- ❖ Bug-fixing not included.
- ❖ No interest in getting certified.
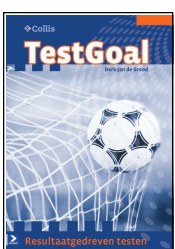- ❖ Certification party; testing the tester?

Differences at a glance

	Functional testing	Conformance Testing
Scope	Fit for purpose	Conform the standard
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Further reading

Chapter on Conformance testing is basis for this presentation.

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Wrap-up

Questions?

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