Viewpoints on lacking B2B interoperability

and the future role of standards…

20 years of system integration and still it isn't working…why?

Erwin Folmer

The viewpoints

- The need for interoperability is overestimated
- Cross-sector interoperability; which cross-sector?
- The quest for the perfect solution that doesn't exist
- There is a business case for imperfect interoperability


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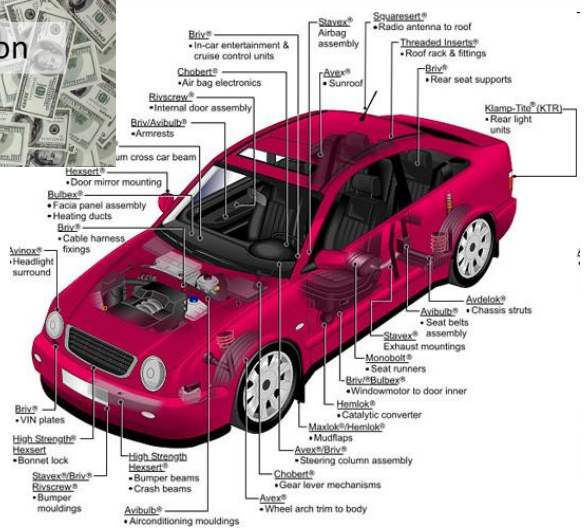
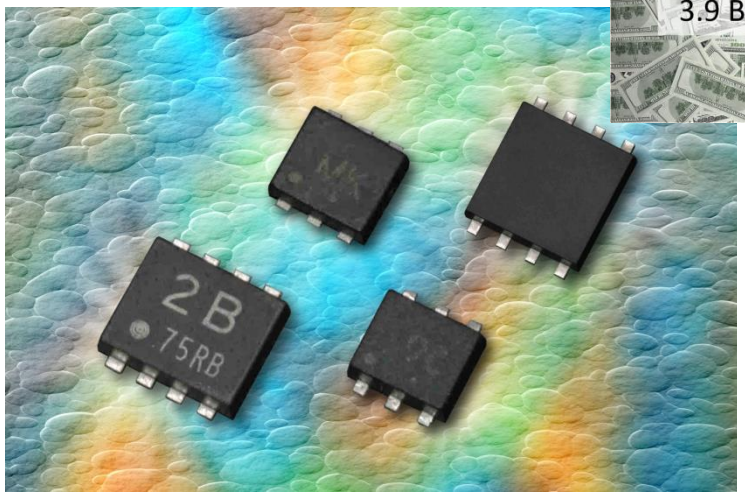
IMPORTANCE OF INTEROPERABILITY





Interoperability in practice?

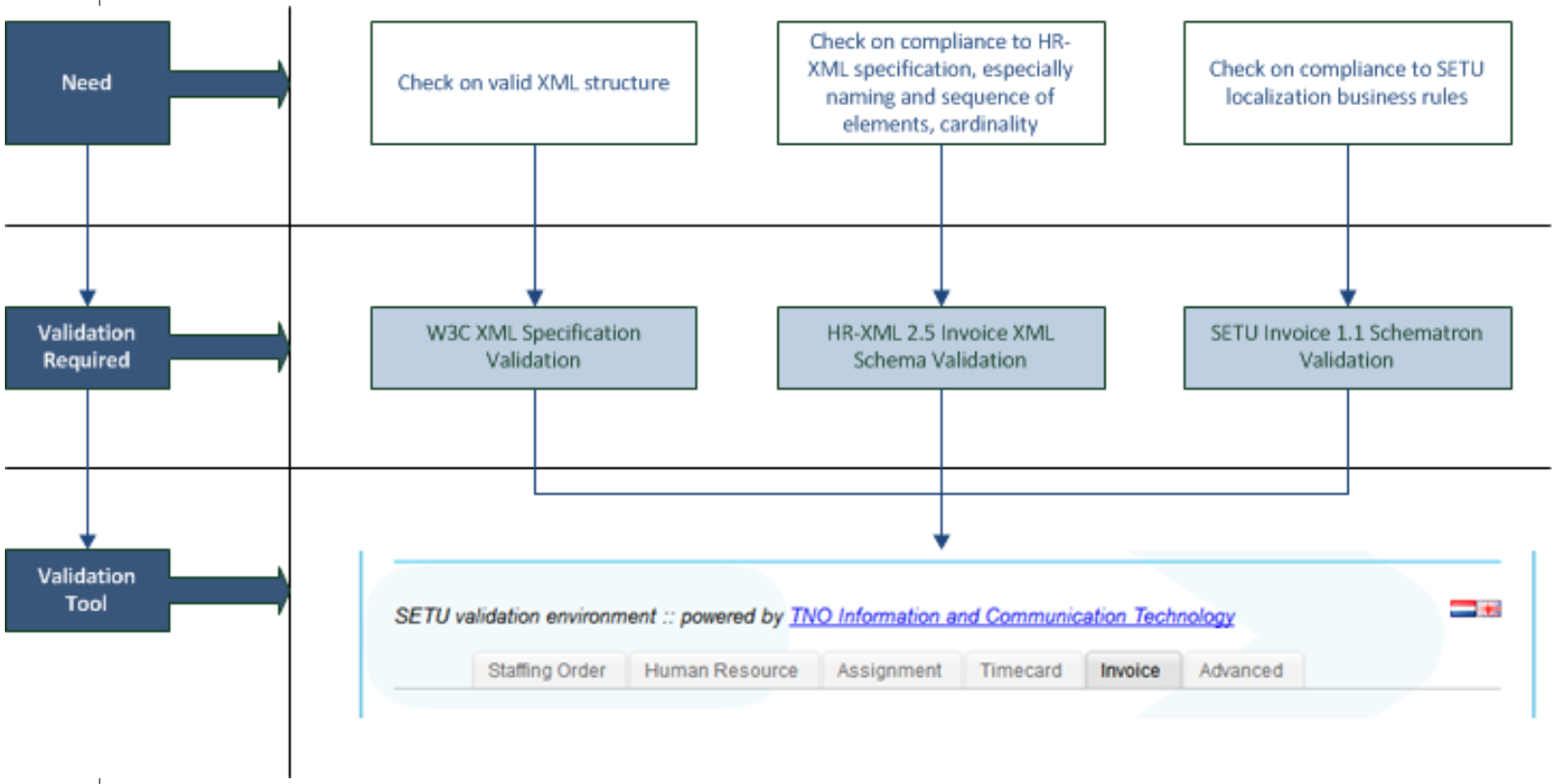
Successful standard: SETU for Invoicing

- All stakeholders very satisfied with standard.
- Adoption is ok.
- No complaints about lacking interoperability.
- Comply or explain (government status).

And test real-life integration cases…

Approach

- Data collection: timecards (32) and invoices (22)
- iQMSS: Interoperable Implementations, Completeness and Relevancy
- 3 steps:
  - 1. SETU eValidator
    a) XML Well-formedness
    b) XML Schema validation
    c) Business Rules validation


Need
Check on valid XML structure
Check on compliance to HR-XML specification, especially naming and sequence of elements, cardinality
Check on compliance to SETU localization business rules
Validation Required
W3C XML Specification Validation
HR-XML 2.5 Invoice XML Schema Validation
SETU Invoice 1.1 Schematron Validation
Validation Tool
SETU validation environment :: powered by TNO Information and Communication Technology
Staffing Order
Human Resource
Assignment
Timecard
Invoice
Advanced

Validation Results

- 1 out of 20 is not well-formed, and has basic structure errors
- 5 out of 20 have basic XML Schema error and do not validate against schema
- 19 out of 19 (100%) have Business Rules error and do not comply to the SETU standard

- Two kind of errors:
  - Unclear within the standard: easy improvements!
  - Avoidable….but that raises the question….

Dive deeper into reasons…

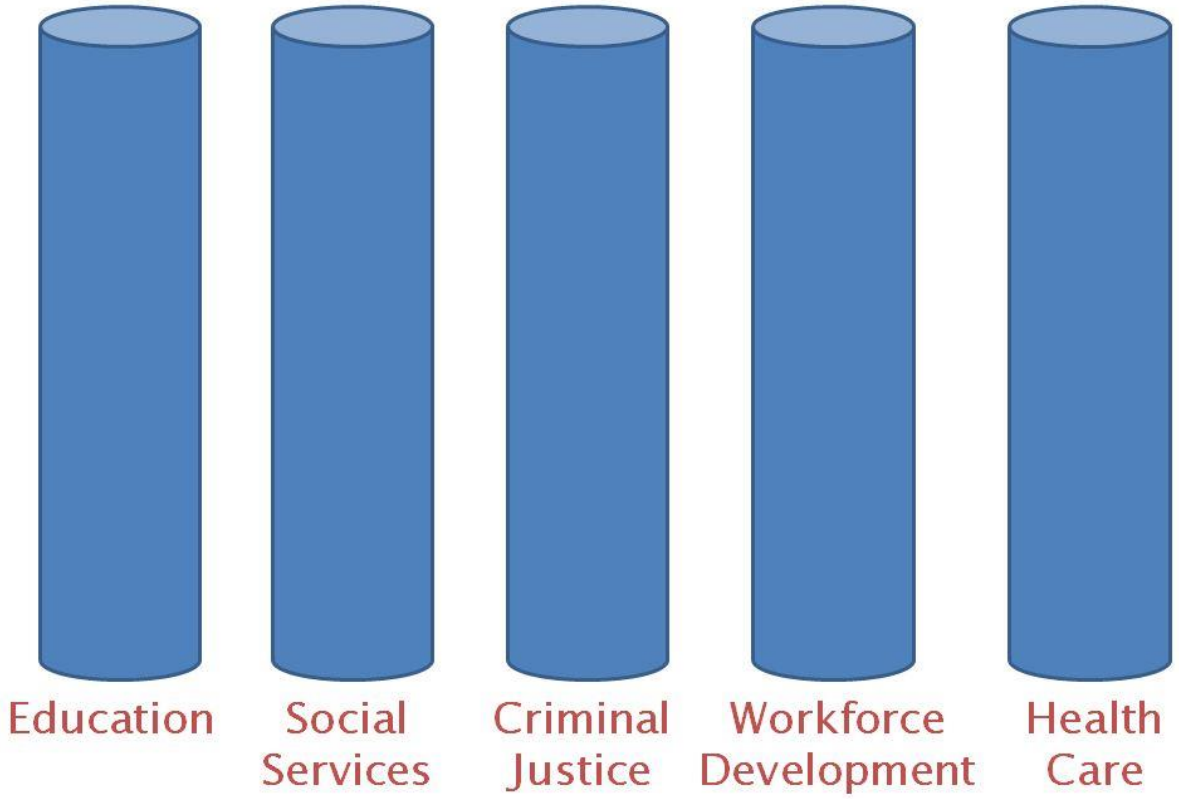
- Business people: 90% interoperability is more than enough!
- 10% means: avoidance of large project, but still be unique

- Of course everybody say they are not competing on IT, but in the end everybody loves a bit of vendor lock-in (but doesn't dare to say so).

- Plug and Play Business (with automatic matching) might be the biggest nightmare of business people!

- So the need for plug and play interoperability might be overestimated!

2. Cross sector interoperability



Cross sector interoperability…

Show me a study what the lack of cross-sector interoperability costs society?
Is it on top of CIO lists (Gartner, Forrester, Whatever) ?

Yes, ok, invoicing is cross sector. But still how big is the problem that each sector has its own solutions/standards?

Are solutions really needed? Can we apply the 80/20% rule?
There is still so much work to do within the sectors it self…

3. The quest for the perfect solution…

(there is no business case for perfect solutions)

For solutions, other than standards:

- Too complex techniques, not proven, too many comparable techniques (although they all say they are unique), limited tool support, limited education/knowledge transfer, etc.…

- Too good, too perfect….

- And in the end…..too

3. The quest for the perfect solution…

For standards it results in:

- Too many new versions…
  - No standard is ever finished…
  - Standardisation people are intrinsic motivated (several studies), which leads to the continuous improvement of their “baby”, and ironically lowers interoperability in practice.
- Too complex techniques, because we want to be state of the art…

- Too late: Kroes: 36, 18 months, acceptable?

- “Pressure cooker concept”

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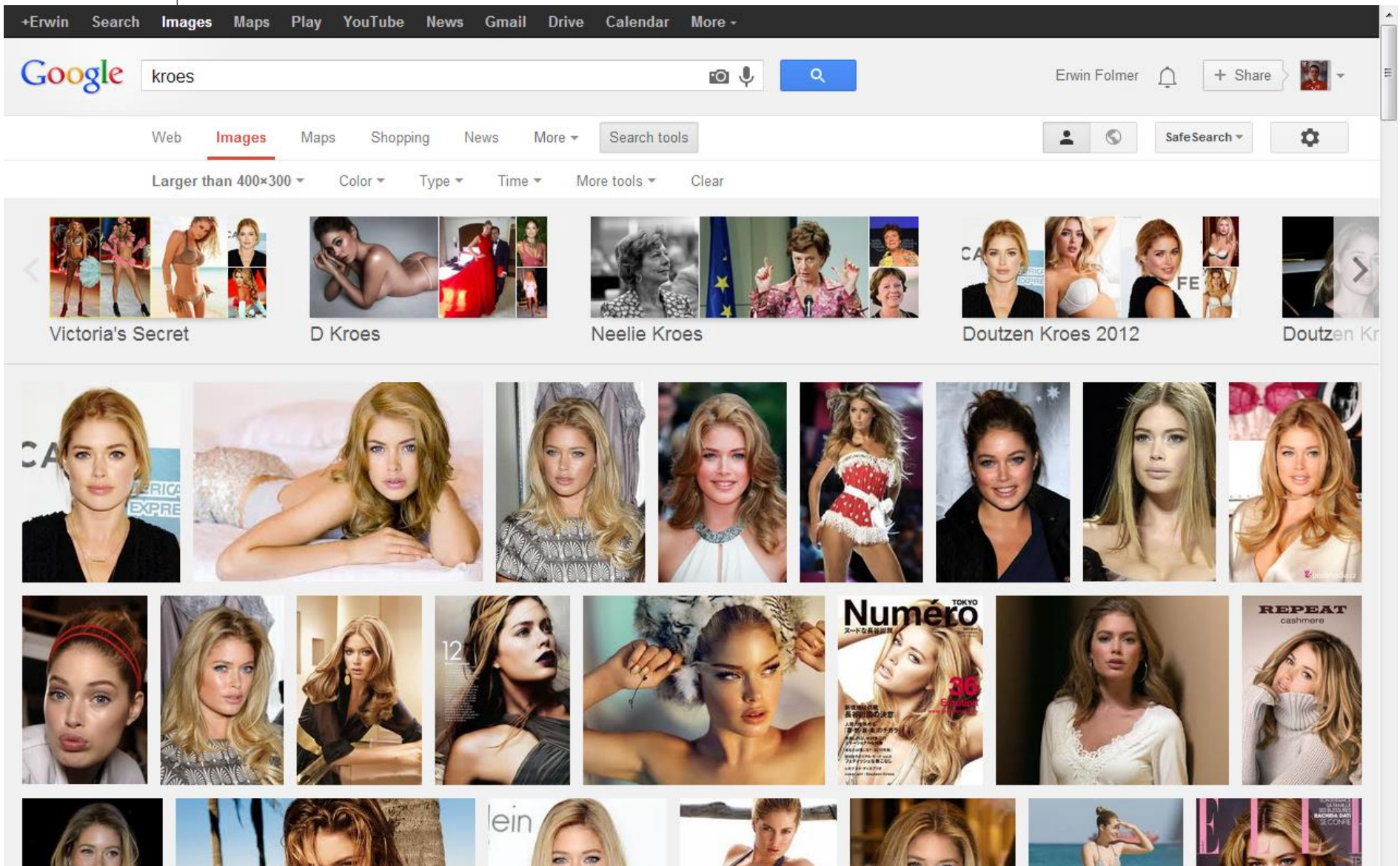
Lacking interoperability has positive impact!

























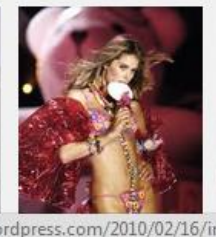






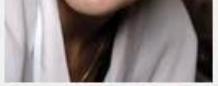












































The Instant Standard Method

Research gap: the development process

The idea: Why cannot we develop in 1 week?

How: Let's put the people together and aim an 80% standard!

Key: quality (80%) + commitment (WG+SC)

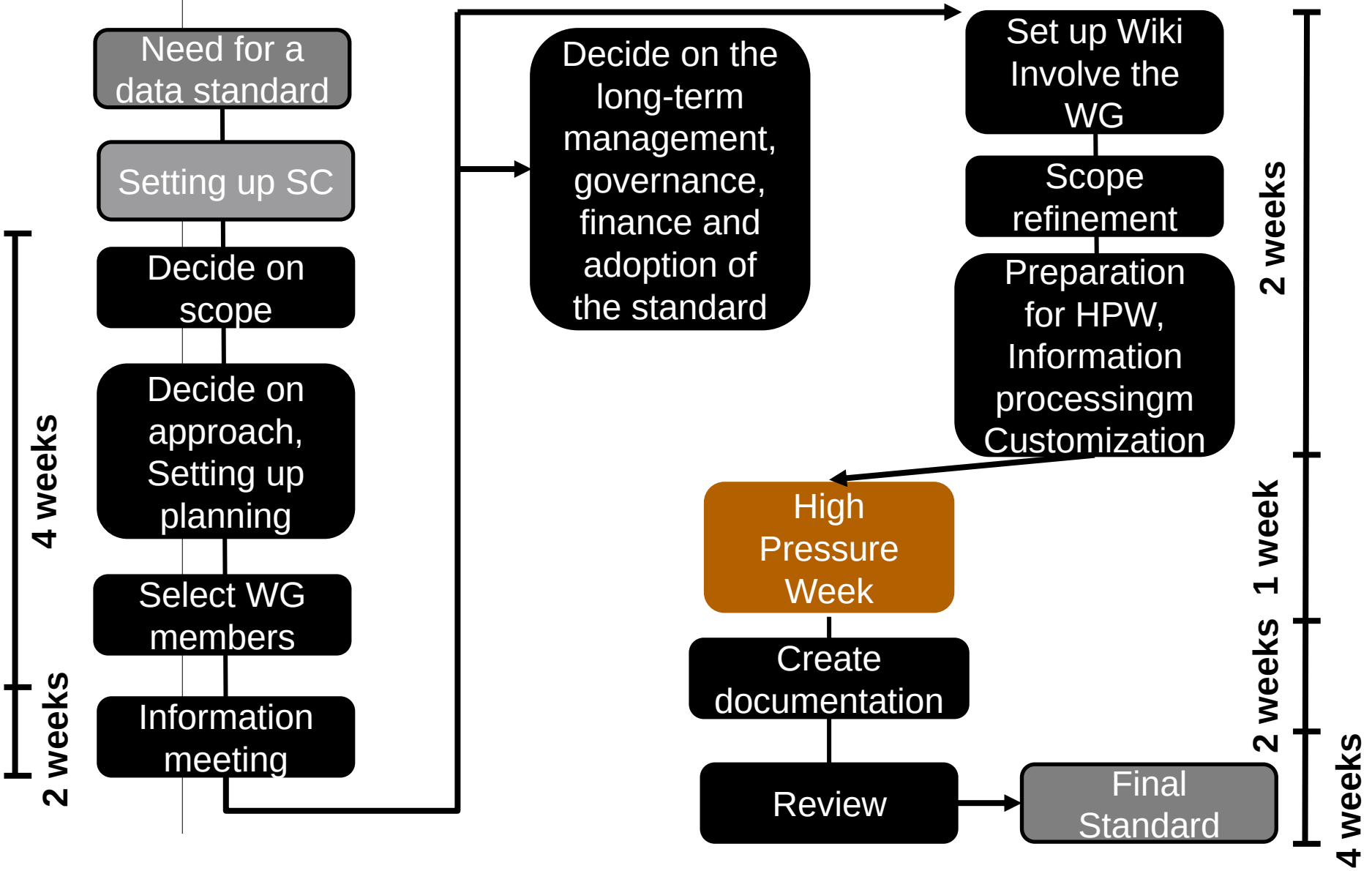
The Instant Standard Model

3 roles:

- Steering Committe,
- Workgroup,
- Standardization experts.

Traditional standardization: 5-6 weeks between the development sessions

Instant standard: all the session are following each other within a week


Need for a data standard
Setting up SC
Decide on scope
Decide on approach, Setting up planning
Select WG members
Information meeting
4 weeks
2 weeks
Decide on the long-term management, governance, finance and adoption of the standard
Set up Wiki Involve the WG
Scope refinement
Preparation for HPW, Information processingm Customization
High Pressure Week
Create documentation
Review
Final Standard
2 weeks
1 week
2 weeks
4 weeks

Start of the High Pressure Week

DAY 1

Kick-off

1. Introduction
2. SC presentation
3. Present goal, schedule, and rules
4. Scope refinement

Business overview

DAY 2

Information model

DAY 3

Free

DAY 4

Information model

DAY 5

Manage the Parking-lot

Set up technical requirements

Overview, Preparation for review

Drinks

End of the High Pressure Week

Validation of the results

3 applications:

EBA: E-waybill for Waste Transport

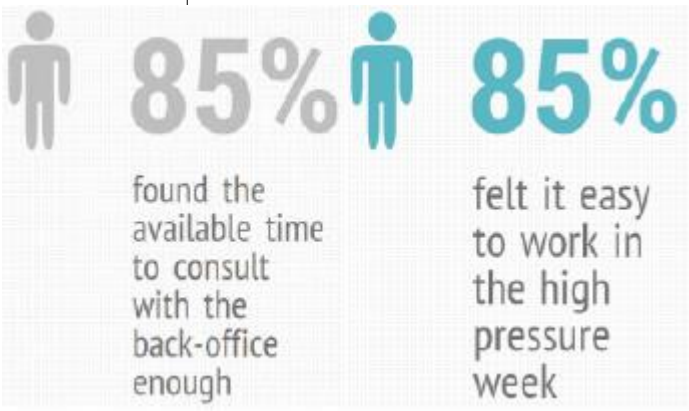
COMBI AANLEG

Digitale Rotonde

Survey (the workgroup members)
Response rate 27/43, 63%

Validation of the results

The real case implementation were evaluated by a survey and by expert interviews.



Like:

- Great collaborative work
- Pressue
- Environment

Dislike:

- Repeated discussions
- Not enough time for decision making

Instant Standard, Go or Not-go

# of stakeholders	Above 10	Below 10
Approach	Minimalist	Structuralist
Experts' technical knowledge	Low	High
Target	80% standard	100% standard
Level of commitment	Low	High
Complexity of the business network	Low	High
Maturity of the standard	Low	High
Innovation level	'Regular' standards	Anticipatory standards
Awareness of the SC	Low	High

4. There is a business case for imperfect interoperability

Many solution vendors….and even more consultants make a living out of imperfect interoperability

* The case of a large ERP vendor and one standard

But even we as researchers/scientists…we have a living because there is a lack of interoperability…

So what is my interest to solve interoperability?

The Future role of Standards

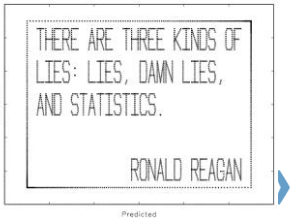
QUALITY OF STANDARDS: WHY IMPORTANT?

DIFFICULTY OF SEMANTIC IS STANDARDS

- Different to other kinds of standardization
  - Ongoing maintenance (user requirements change often) (Steinfield et al. 2007)
  - Evolving of standards as newer technology arrives (Steinfield et al. 2007)
  - Open sharing of knowledge (Zhao et al. 2005, Boh et al. 2007)
  - Quick standard setting process (Boh et al. 2007)
  - No standards wars (Cowan 1991, Zhao et al. 2005)
  - Significant role of User Groups (Zhao et al. 2005)
  - Many more (IPR, Standardisation process, standards users/developers) (Zhao et al. 2005)

  - Need a certain level of flexibility

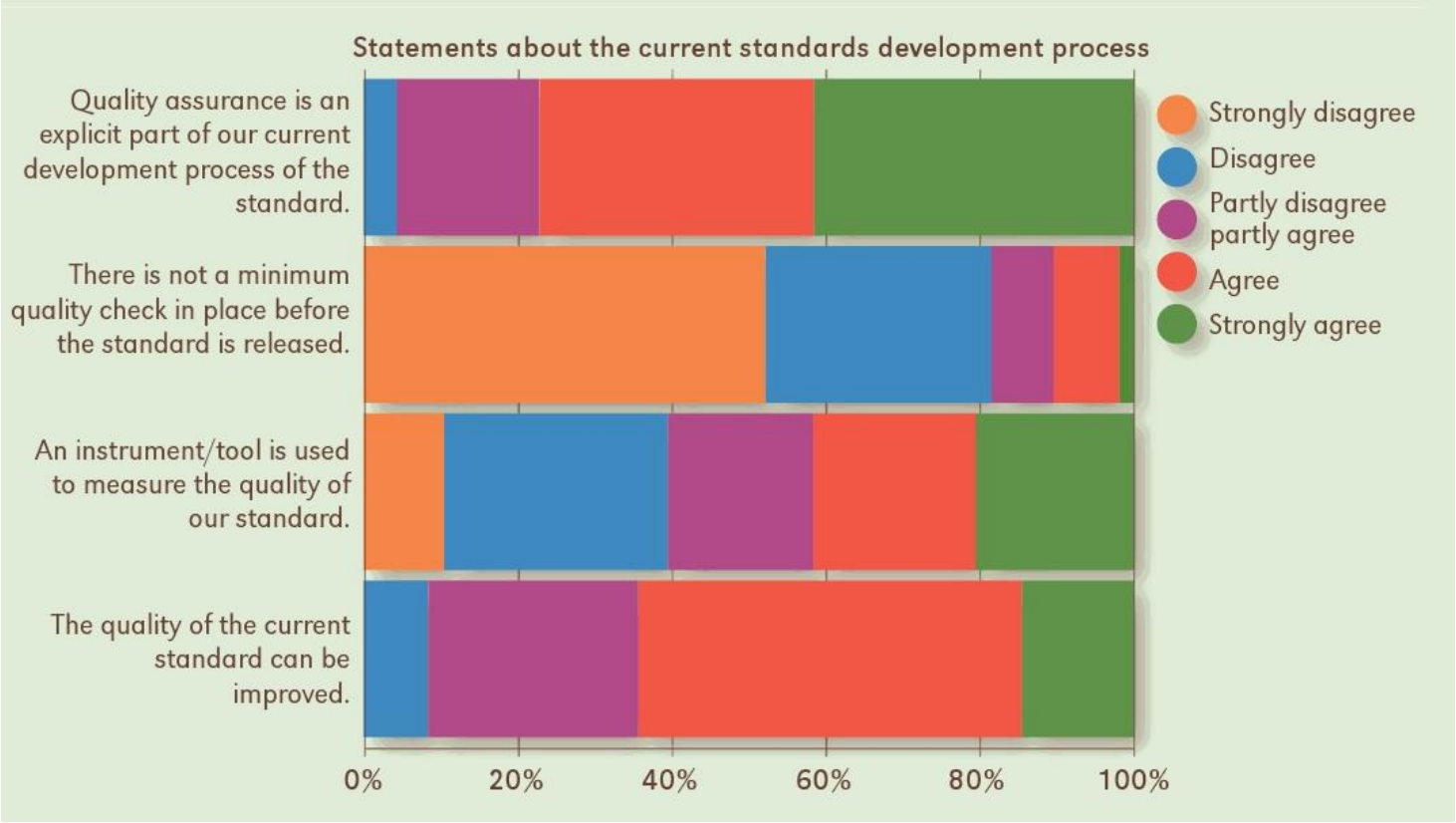
The biggest misconception about standards



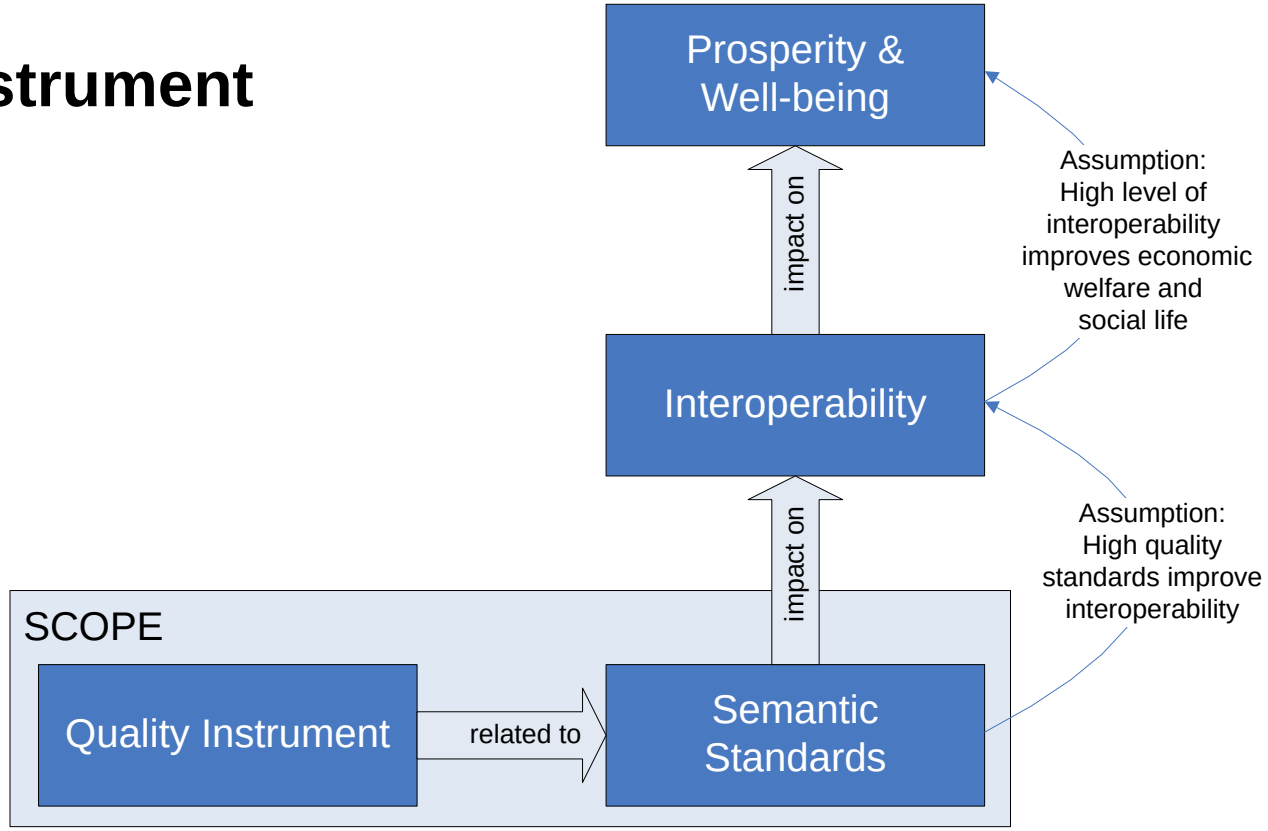
- Standardization does not mean that everything has to be harmonized to 1.
- Misconception: standards can not be flexible?
- The game of standardization is to get the right amount of flexibility (and other criteria) in the standard. That is “quality”…

QUALITY OF STANDARDS: WHY IMPORTANT?

PROBLEM SURVEY



Quality Instrument



- If we are only able to improve the quality of the standards a bit…(and we accept 90% interoperability)

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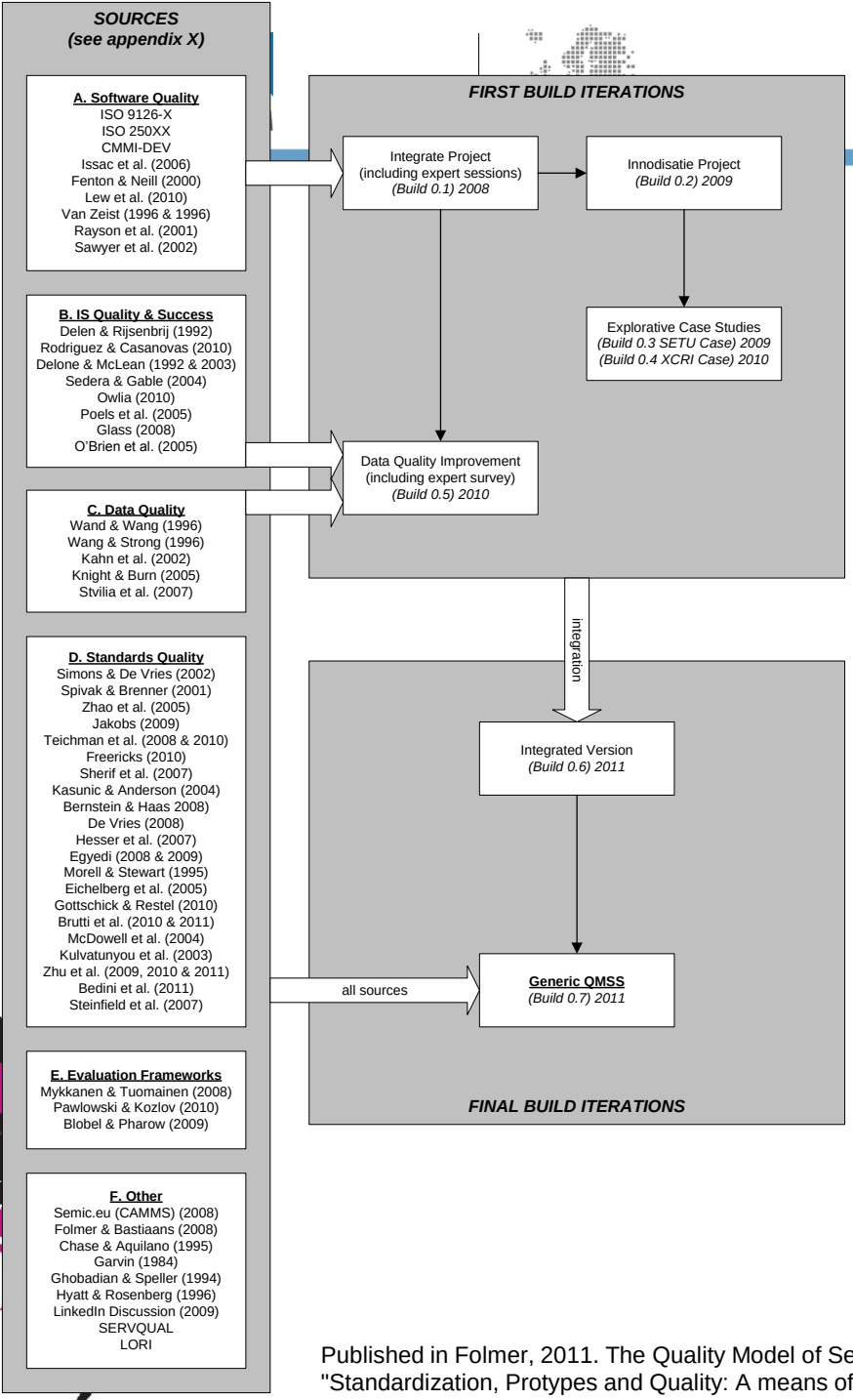
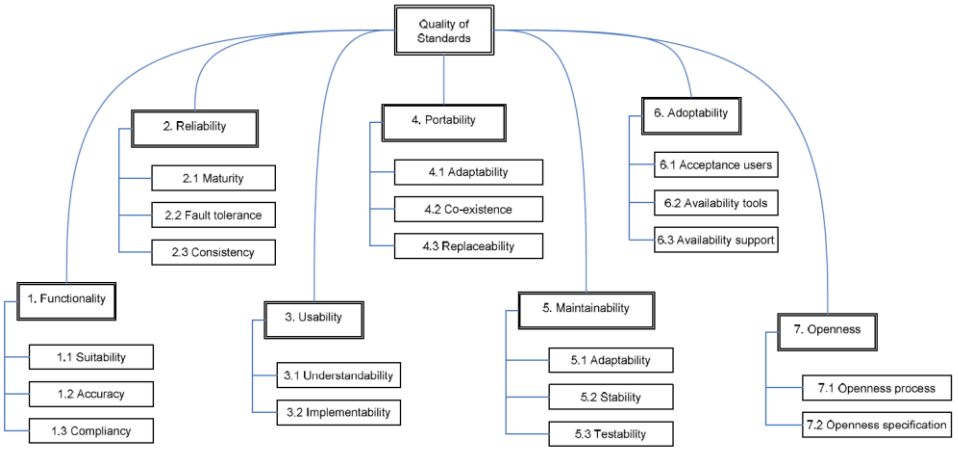
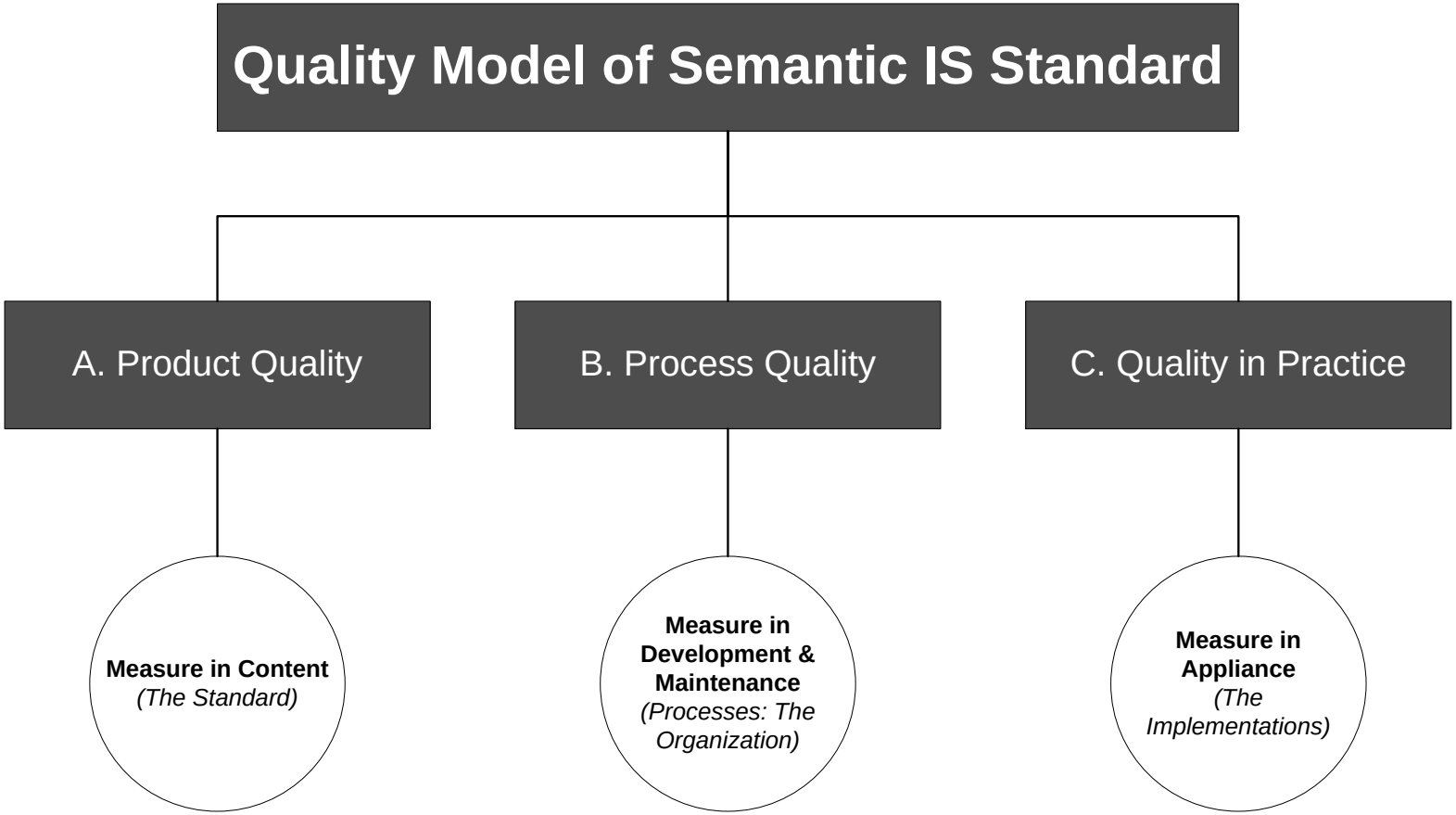
QUALITY MODEL (QMSS)



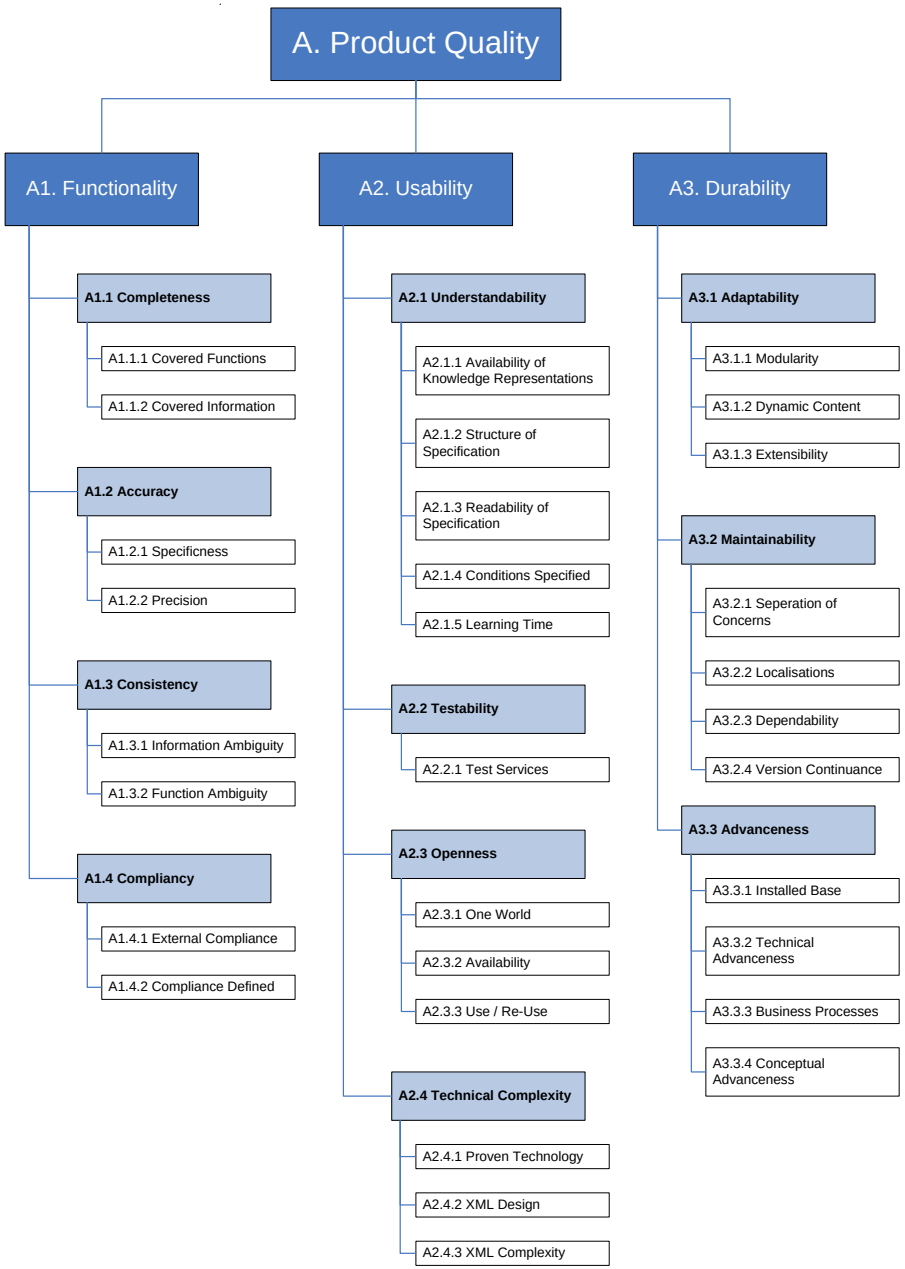


Published in Folmer, 2011. The Quality Model of Semantic IS Standards, 8th International Conference "Standardization, Protypes and Quality: A means of Balkan Countries' Collaboration.

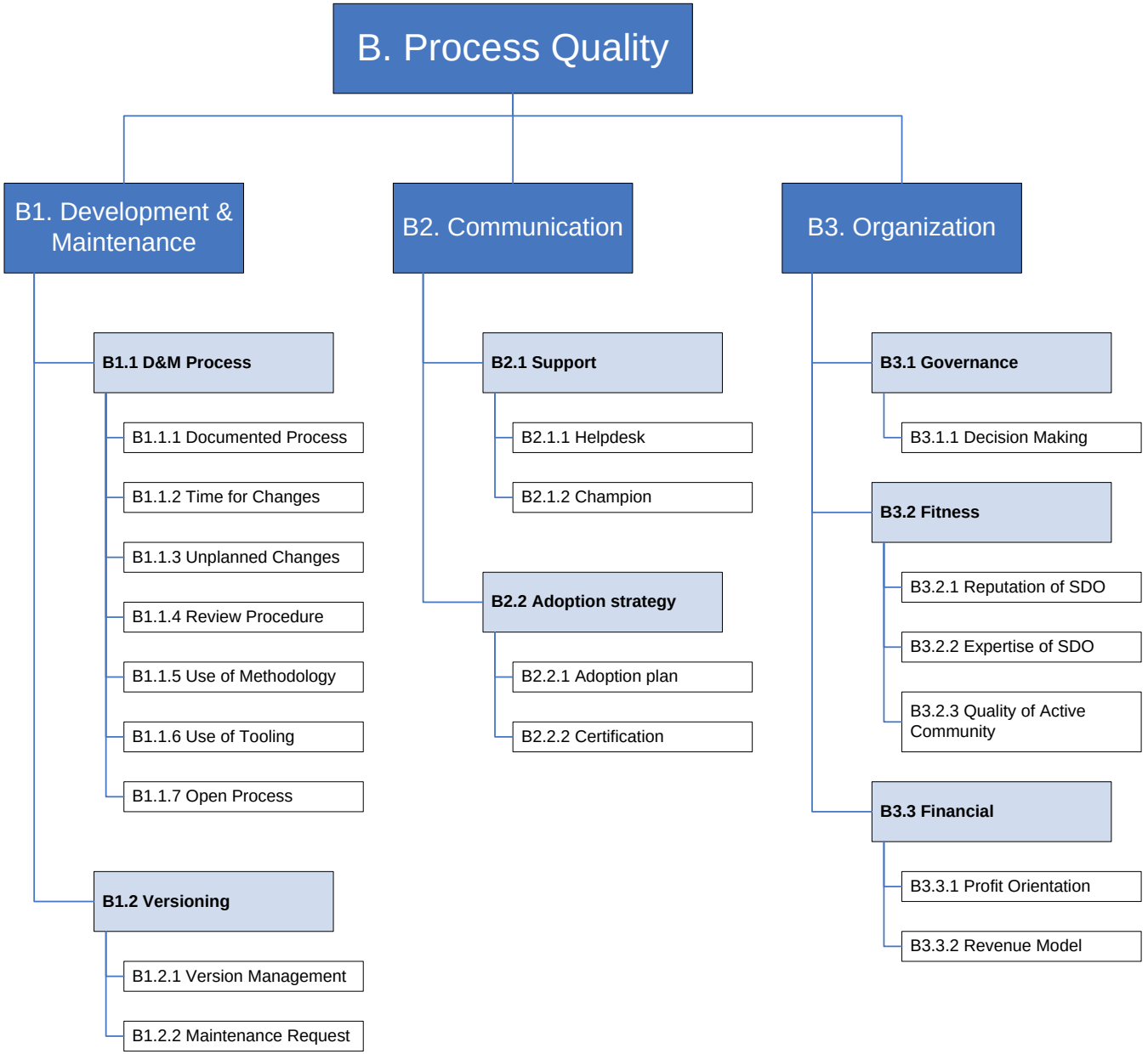


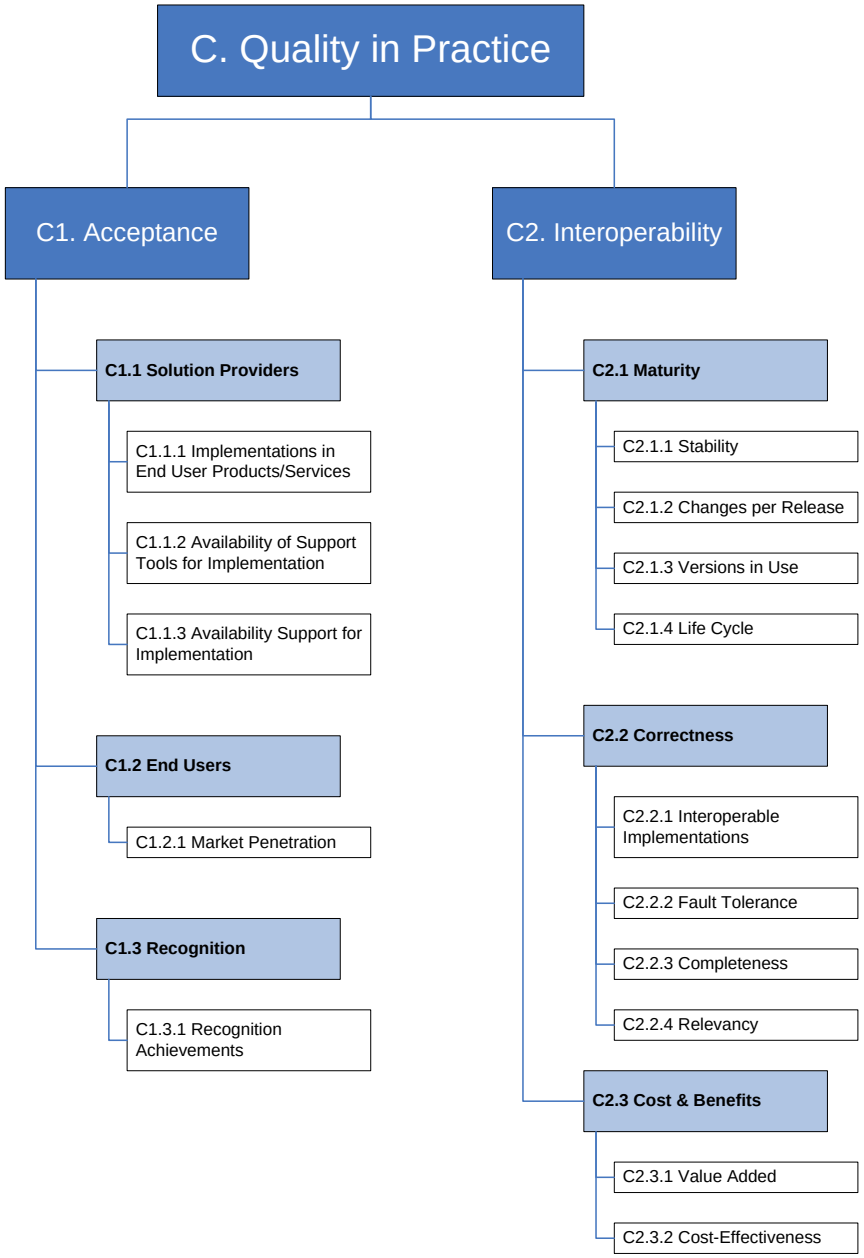
What is the Information Need?

1. The internal quality of the standard? – Part A
2. The implementability of the standard? – Part A+ B
3. The durability (future-proofness) of the standard? – Part B + A (partly)
4. Should I select the standard? – Mainly part C
5. Is the standard a good solution for the interoperability problem? – All parts



Measurable Concept	Definition	Remarks
A. Product Quality	The total of attributes of a standard that determines its ability to satisfy stated and implied needs when used under specified conditions (ISO 9126)	This includes both internal and external quality in ISO terms.
A1. Functionality	The capability of the standard to provide functions which meet stated and implied needs when the standard is used under specified conditions. (ISO 9126)	The specification fulfills the functional needs of the intended job.
A1.1 Completeness	The extent to which a standard is of sufficient breadth, depth, and scope for the task at hand. (Wand & Wang, 1996)	This includes other terms like relevancy and suitability, and is the functional view on the content of the specification. The task at hand is aimed at solving an interoperability problem.
A1.1.1 Covered Functions	The level of functions specified in the specification in relation to the interoperability problem.	Indicates if the standard covers all functionality required to solve the interoperability problem.
A1.1.2 Covered Information	The level of information elements specified to support for the interoperability problem	When information elements are missing or when too many information elements have been added, it will negatively impact interoperability.
A1.2 Accuracy	The capability of the standard to provide true data with the needed degree of precision. (ISO 9126 & ISO 25012)	The level of needed specificness and precision of both semantic meaning and technical syntax. (This does not cover, but relates to, the quality of the content: consistency (A1.3))
A1.2.1 Specificness	The level of detail and in-depth of the scope.	Does the standard address a specific problem or a generic problem?
A1.2.2 Precision	The match between the precision requested and provided, unambiguously. (ISO 25012)	Syntactic and semantic accuracy. (For instance *sur*name (instead of name, and not limited to 10 digits).
A1.3 Consistency	The extent of consistency in using the same values (vocabulary control) and elements to convey similar concepts and meaning in a standard. (Stvilia et al., 2007)	The degree of coherence and freedom of contradiction within the standard (ISO 25012). The quality of the content of the different models.
A1.3.1 Information ambiguity	The level of ambiguity of the information elements, and consistency of use.	The quality of the structuring and definition of the information elements.
A1.3.2 Function ambiguity	The level of ambiguity of the function elements and consistency of use.	The quality of the structuring and definition of the functions, processes and business rules.
A1.4 Compliancy	The capability of the standard to adhere to other standards, conventions or regulations in laws, but also defining what compliancy implies for this standard. (ISO 9126 & ISO 25012)	How compliancy to other standards is implemented, and how conformance to this standard can be assured.


B. Process Quality
B1. Development & Maintenance
B2. Communication
B3. Organization
B1.1 D&M Process
B1.1.1 Documented Process
B1.1.2 Time for Changes
B1.1.3 Unplanned Changes
B1.1.4 Review Procedure
B1.1.5 Use of Methodology
B1.1.6 Use of Tooling
B1.1.7 Open Process
B1.2 Versioning
B1.2.1 Version Management
B1.2.2 Maintenance Request
B2.1 Support
B2.1.1 Helpdesk
B2.1.2 Champion
B2.2 Adoption strategy
B2.2.1 Adoption plan
B2.2.2 Certification
B3.1 Governance
B3.1.1 Decision Making
B3.2 Fitness
B3.2.1 Reputation of SDO
B3.2.2 Expertise of SDO
B3.2.3 Quality of Active Community
B3.3 Financial
B3.3.1 Profit Orientation
B3.3.2 Revenue Model


C. Quality in Practice
C1. Acceptance
C2. Interoperability
C1.1 Solution Providers
C1.1.1 Implementations in End User Products/Services
C1.1.2 Availability of Support Tools for Implementation
C1.1.3 Availability Support for Implementation
C1.2 End Users
C1.2.1 Market Penetration
C1.3 Recognition
C1.3.1 Recognition Achievements
C2.1 Maturity
C2.1.1 Stability
C2.1.2 Changes per Release
C2.1.3 Versions in Use
C2.1.4 Life Cycle
C2.2 Correctness
C2.2.1 Interoperable Implementations
C2.2.2 Fault Tolerance
C2.2.3 Completeness
C2.2.4 Relevancy
C2.3 Cost & Benefits
C2.3.1 Value Added
C2.3.2 Cost-Effectiveness

Indicators (Work of Zhu & Wu)

- Completeness
  - Insufficient standard
- Relevancy
  - Too much garbage
- Case XBRL, SETU

$$Completeness_c = \frac{\left|\left(\bigcup_i U_i\right) \cap S\right|}{\left|\bigcup_i U_i\right|}$$

$$Relevancy_c = \frac{\left|\left(\bigcup_i U_i\right) \cap S\right|}{|S|}$$

Final Thoughts…

- Standards will accommodate the needed flexibility, and although their content will change, they will be crucial for achieving interoperability.
- The value of the existing organization structures, the industry consortia (informal standards bodies), is underestimated.
- Moving from closed world to an open world (like the web)
  - (standards, data, solutions, knowledge, etc)
- Linked Open Data (Semantic Web)….might become a paradigm to be real open, proven technology, not perfect, …handles legacy, context, etc.

Key message

Lacking Interoperability, my viewpoints:

- The need for interoperability is overestimated
- Cross-sector interoperability; which cross-sector?
- The quest for the perfect solution that doesn't exist
- There is a business case for imperfect interoperability

Future of standards:

Improve the quality of standards: Flexible Standards

Look at Linked Open Data for the future (participation?)

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