

Connecting B2B standards life cycles with stakeholders

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Business-to-Business (B2B) is one of the areas getting more and more attention in terms of inter-organisational co-operation. In B2B, numerous transactions and communication flows take place between organisations and disparate systems. A standards-based approach is common in this respect. A B2B standard is defined as *guidelines for how communication and information sent between organisations should be structured and managed* (Söderström, 2004). Such standards are implemented between several partners as a means to achieve a common language, increased integration between systems, and increased automation. The standards undergo a number of activities and phases during their existence, much like “regular” IT and information systems. The series of activities and phase are often referred to as a life cycle.

The **general life cycle model** consists of 10 phases. Before development starts, there must be an *initiation* phase, during which the idea of the standard is born. This applies whether the standard-to-be precedes or follows on technology developments. The phase includes preparations for the standards development process. The second phase is *standards development*. Here, standards specifications are developed, defined, and negotiated. These are the essence of standards. The road ahead can be undertaken in two directions. One is to the *creation of products* based on one or more standards. Software products are not a necessary requirement for standards implementations, even though it is the most common approach. The other direction is to an *implementation* phase, where standards (and possibly standards-based products after creation) are implemented in organisations. Since tests of different types are so important, they should belong to a separate phase referred to as *conformity assessment* (CA). CA can be applied on different occasions, e.g. after completion of a standards-based product or after implementation of a standard or a standards-based product. Examples of techniques for testing are (ISO, 2003): *Testing*, for example calibration and measurement; *Inspection*, for example quality and suitability for use; *Certification*, for example written assurance from a first, second or third party that a product, service, system, process or material conforms to specific requirements; and *Accreditation*, for example giving formal recognition of competency to carry out specific tasks. Previous studies have identified the lack of knowledge in user organisations as a problem (Söderström and Pettersson, 2003; Premkumar et al, 1994). Without knowledge about standards, users have fewer chances of affecting e.g. the standards development process. *Education* is therefore important. Education is an important matter if standards and their related products are to be used efficiently and effectively. Following implementation is actual *use* of standards and related products. The term “use” is often confusing, as many sources refer to this being equal to the use of software. We refer to use as all activities undertaken when utilising the standard and/or software in real-life business settings. *Maintenance* in the standards community is a forgotten subject. For example, standards management, which is a part of maintenance, is not researched much (Boh et al, 2003). Nevertheless, it is important, since buying new software each time for example an alteration was needed would mean an immense financial effort. As any other technology or

system investment, maintenance is needed to keep the standard/system operating as intended, e.g. to monitor and improve quality and productivity (Fasolino et al, 2000). *Feedback* refers to users reporting back to the developers of products or standards what they think about the standard: what works or not, which problems have been experienced and so on. The feedback creates one of the possible inputs for evolving standards, and is thus an important phase. Finally, there is a *termination* phase. There are occasions when standards are determined to be obsolete, and are taken out of use. For example, if we speak of communication standards, any connection a company has with suppliers and/or customers will be affected by a change in or removal of a standard.

There are also different types of **stakeholders** that have an interest in standards and how they are used and evolved. Six stakeholder types have been identified. *Standards developers* are by far the most commonly discussed role in literature. Standards development can occur on several levels (combining Baskin et al, 1998; Slob and de Vries, 2002; Ollner, 1988; and Sivan, 2000): Individual; Organisational; Association; National; and International. *Standards users* are an essential stakeholder, since they ultimately decide the success of a standard, by using it or not. SUOs may also exist on several levels (combining Jakobs et al, 1996; Sivan, 2000; Weiss and Spring, 2000; Cargill, 1995; and Chauvel, 2003): End-user; Departmental; and Organisational. *Standards adaptors* are a rather small stakeholder type. These organisations adapt standards to fit e.g. a specific industry sector or a specific company. In the first case, the role is often assumed by different types of trade associations and block alliances (Sivan, 2000; Warner, 2003; Cargill, 1995; Mähönen, 2000; Egyedi, 2000). *Standards software organisations* are becoming increasingly important. They take standard specifications and construct software based on them. In this way, users can buy the software product and automatically use the standard (Slob and de Vries, 2002). *Service providers* are those organisations that provide services such as testing, consultancy work, and training and education. Such services are often either provided by the standards developers or by software organisations. Finally, *standards researchers* are important. Research can be undertaken either in academic or in industrial settings. Those taking on this role are interested in various aspects of standards. Attention to these stakeholder types may indicate what organisations to keep in contact with during various parts of the life cycle.

This paper deals with connecting life cycle phases to stakeholder types. Life cycles per se are useful for understanding standards and how they relate to the complex contexts and activities around them. Stakeholder types may furthermore not only have varying interests in standards, but may also take on different roles around standards as the life cycle phases are progressing. Together, these aspects can point to how to deal with standards from different perspectives, as well as what organisations to pay attention to during e.g. implementation.

Originating from each process in the life cycle, we elaborate on how processes and roles may be connected, and which roles are active in different parts of the life cycle. The discussion is summarised in Figure 1, and will primarily be based on which role takes on main responsibility for the life cycle phase. Please note that SRs are not depicted in the figure, since they have an interest in all parts of the life cycle. The *initiate* process will not be included, however, since any one of the roles may be responsible for creating ideas for standards.

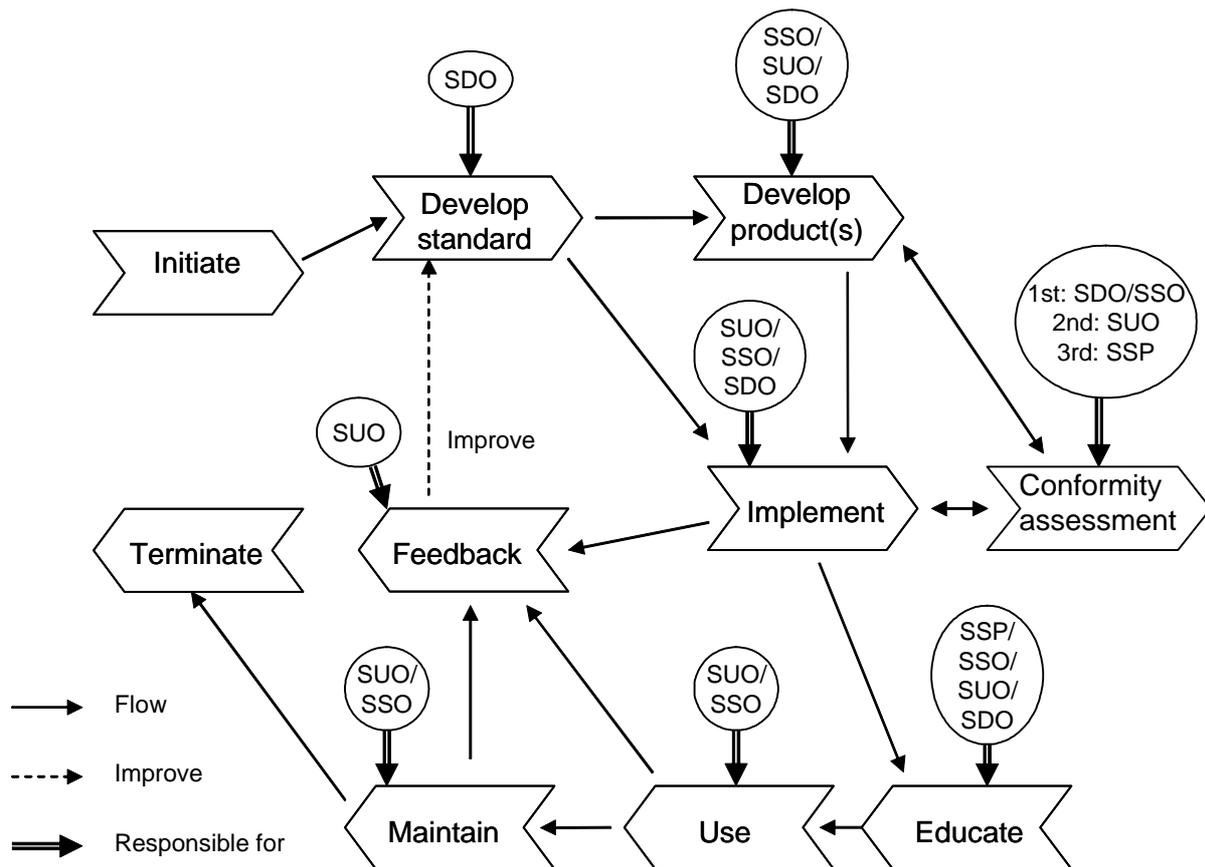


Figure 1: Summary of the connections between processes and roles

The responsible party for *developing standards* is always a SDO. However, the organisations making up an SDO can vary. SDOs may comprise either specifically dedicated organisations that assume no other roles during the life cycle, or of commercial organisations. *Product development* is somewhat more limited than standards development in terms of which roles are involved. The responsible organisation is mostly SSOs, but advanced SUOs may also develop their own in-house products. The majority is regular, commercial SSOs. SDOs can also participate in the products development process, since many of them make reference implementations. The *implementation* process is one of the most complicated processes in the life cycle, since it has so many connections to other processes. The responsible party for implementation can either be a SUO, a SDO, or a SSO. Users are implementers when they themselves take the standards specifications and make changes to processes and products accordingly. SDOs are implementers when they make their reference implementations. This is often regarded as part of the development process, since it helps confirm that the standard works as intended. SSOs are implementers when they take their products and consult the users in how to implement them in the user organisations. This is one of the more common situations. As with other processes, different roles can be responsible for making *conformity assessment* of standards-based products and implementations. SDOs can perform conformity assessment of their own standards, and SSOs can do the same for their standards-based products. In both cases, this is called first-party assessment (ISO, 2003). SUOs can also perform conformity assessment of the standards and/or products they obtain. If so, this is called second-party assessment (ISO, 2003). The third alternative is when SSPs conduct the assessment. Preferably, SSPs of this kind should not be involved in any of the standardisation work to allow their impartiality. If so, this kind of assessment is called third-party assessment (ISO, 2003). *Education* is, as mentioned, an important matter if standards and their related

products are used efficiently and effectively. One common role involved in education is the SSP, in terms of commercial and academic educational institutions. However, SDOs can help their users to learn more, as can SSOs. It is probably more common for SSOs to be the educators, since some education often is included in their consultancy work during implementation. Furthermore, there is an important distinction between SSOs and SSPs in this matter. SSOs focus on specific standards and situations, while SSPs often take a general view on education. Only SUOs *use* standards in their daily work. However, it needs to be pointed out that e.g. SSOs and SSPs can also use standards in their daily work, which means that the same organisation can be both a SUO and a SSO/SSP. It depends on the viewpoint taken. SUOs are the most common role responsible for conducting the *feedback* process, since they are the ones with real-life experience whether or not a standard and/or product works in practice. Feedback can thus be given to both SSOs and SDOs, depending on whether it was specifications or products the user implemented. The party responsible for *maintaining* standards and standards-based products in SUOs is integrally related to who made the implementation. If SUOs have consulted SSOs to install their implementation, it is more common that the maintenance of the product is outsourced to the same SSO. With regards to standards maintenance, the creating SDO is also responsible in this matter for activities including updates and versioning to changes in an existing and used standard. At some point, many standards become obsolete and need to be replaced or removed. The party responsible for *termination* depends on whether the need is to replace or to terminate. Termination is managed by the same SDO that created the standard and has since maintained it. Replacement is managed by the SUOs, and may be caused by market changes, technology developments or new demands from important partners.

References

- Baskin, E., Krechmer, K. and Sherif, M. (1998), The six dimensions of standards: Contribution towards a theory of standardization, In Lefebvre et al (eds), *Management of Technology, Sustainable Development and Eco-Efficiency*, Elsevier Press, Amsterdam, 1998
- Boh, W.F., Yellin, D., Dill, B. and Herbsleb, J. (2003), Effectively managing information systems architecture standards: an intra-organization perspective, In King and Lyytinen (eds.), *Standard Making: A Critical Research Frontier for Information Systems*, MISQ Special Issue Workshop, Pre-conference workshop for International Conference on Information Systems (ICIS 2003), December 12-14, 2003, Seattle, USA, pp.171-187
- Cargill, C. (1995), A Five-Segment Model for Standardization, in Kahin and Abbate (eds.), *Standards Policy for Information Infrastructure*, MIT Press, Cambridge, MA, USA, pp.79-99
- Chauvel, Y. (2003), "Standards and Telecommunications Development: Where Are We Going?", *International Journal of IT Standards & Standardization Research*, Vol.1, No.1, January – June 2003, Idea Group Publishing, pp.50-53
- Egyedi, T. (2000), "Institutional Dilemma in ICT Standardization: Coordinating the diffusion of technology?", in Jakobs, K. (ed.), *Information Technology Standards and Standardization: A Global Perspective*, Idea Group Publishing, ISBN 1-878289-70-5, 2000, pp.48-62
- Fasolino, A., Natale, D., Poli, A., and Quaranta, A. (2000), Metrics in the development and maintenance of software: an application in a large scale environment, *Journal of Software Maintenance: Research and Practice*, 12 (2000), pp.343-355

ISO (2003), *How conformity assessment works*, available at: <http://www.iso.org/iso/en/comms-markets/conformity/iso+conformity-02.html>, as is: June 2, 2003

Jakobs, K., Procter, R. and Williams, R. (1996), "Users and Standardization – Worlds Apart? The Example of Electronic Mail", *StandardView*, Vol.4, No.4, December 1996, pp. 183-191

Mähönen, P. (2000), The standardization process in IT – Too slow or too fast?, In Jakobs, K. (ed.), *Information Technology Standards and Standardization: A Global Perspective*, IDEA Group Publishing, USA, pp. 35-47

Ollner, J. (1988), *The Company and Standardization*, 3rd edition, Swedish Standards Institution, Stockholm, Sweden

Premkumar, G., Ramamurthy, K. and Nilakanta, S. (1994), Implementation of Electronic Data Interchange: An Innovation Diffusion Perspective, *Journal of Management Information Systems*, Fall 1994, Vol.11, No.2, pp.157-186

Sivan, Y. (2000), "Knowledge Age Standards: A brief introduction to their dimensions", in Jakobs, K. (ed.), *Information Technology Standards and Standardization: A Global Perspective*, Idea Group Publishing, ISBN 1-878289-70-5, 2000

Slob, F. and de Vries, H. (2002), *Best Practices in Company Standardisation*, ERS-2002-81-ORG, Erasmus Research Institute of Management (ERIM) Report Series, September 2002, Rotterdam, Netherlands

Söderström, E. and Petterson, A. (2003), Adoption of B2B standards, In Jardim-Goncalves et al. (eds.) *Concurrent Engineering: Enhanced Interoperable Systems*, A.A.Balkema Publishers, Lisse, Netherlands, 2003, pp.343-350

Söderström, E. (2004), B2B Standards Implementation: Issues and Solutions, PhD Thesis, Stockholm University/Royal Institute of Technology, Stockholm, Sweden

Warner, A. (2003), "Block Alliances in Formal Standard Setting Environments", *International Journal of IT Standards & Standardization Research*, Vol.1, No.1, January – June 2003, Idea Group Publishing, pp.1-18

Weiss, M. and Spring, M. (2000), Selected Intellectual Property Issues in Standardization, in Jakobs, K. (ed.), *Information Technology Standards and Standardization: A Global Perspective*, IDEA Group Publishing, USA, pp.63-79