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Co-ordinating Rule Setters – Co-operation in ICT Standards Setting

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Abstract

This paper highlights the need and relevance of standards in the modern complex business world, and identifies the critical problem on the interaction and collaboration of formal bodies and industry consortia that are co-responsible for standards development. Then, the discusses specific aspects relating to competition and co-operation in ICT standards setting, including a discussion about the arguably counter-productive distinction between both groups.. Looking at both theoretical and practical aspects it concludes that co-ordination co-operation of standards setting bodies is urgently called for, and that standards policy in Europe is in need of an overhaul.

Keywords

ICT standardisation, standards setting bodies, co-ordination, co-operation

1. A Brief Introduction

Over the last decades a huge number of consortia and industry fora have entered the ICT standards setting arena. As a result, companies are today faced with an almost impenetrable web of standards setting bodies (SSBs[1]), with complex inter-relations. Each of these bodies has its own membership, works within its own environment, and has defined its own set of rules. The resulting fragmentation of the standards-setting arena, and considerable overlap of the activities of individual SSBs, means that interoperability between standards from different sources cannot necessarily be assumed. Accordingly, improving co-ordination in ICT standards setting has become a major issue.

At the same time, we may observe fierce competition in standards setting. Initially, in the eighties consortia invaded the standardisation territory, which had always been the SDOs' monopoly. This move was also helped by the deregulation of the telecommunication sector. Eventually, the SDOs started fighting back. These days, competition may occur between working groups of different SSBs, and between entire SSBs which cover largely the same ground.

The remainder of the paper will first provide a little historical background in section 2. Subsequently, in section 3 will discuss co-operation in standardisation. Some concluding remarks are given in section 4.

[1] This term denotes both the 'formal' Standards Developing Organisations (SDOs) like e.g., ISO and ITU, and private standards consortia.

2. Some Background

2.1. A Little History – How Did the Current Standardisation Environment Emerge?

The utilisation of standards in the competitive modern world – in several domains besides ICT – that have been fostered by international, regional, and national standards organisations from the 1950s (ISO, 2008). The manufacturing of products (where the assembly parts come from factories located in different countries) as well as the provision of services, have triggered the increased need for standards. This relevance is further emphasised by the increasing complexity of engineering and management of for the associated manufacturing and/or delivering processes (Carlock & Fenton, 2001). Critical failures (frequently reported in the media) on software, tires, medicine, etc) give clear evidence of this complexity. In such a context, standards and models have been developed for identifying, integrating and transferring best practices of business and engineering processes, with the ultimate aim of improving the efficiency, efficacy and effectiveness of the worldwide trade between business organisations.

However, over the last three decades, the world of ICT standardisation has changed dramatically, from the fairly simple, straightforward, and static situation that could be found in the seventies (see Figs. 1 & 2 below). Back in the seventies, there was a clear distinction between the then 'monopolist' CCITT on the one hand, and the remainder of the world of ICT standards on the other. CCITT were in charge of standards setting in the telecommunications sector. They was basically run by the national PTTs, which still enjoyed a monopoly situation in their respective countries. ISO was in charge of almost all other ICT-related standardisation activities. The various national SDOs developed their own specific standards, but also contributed to the work of ISO.

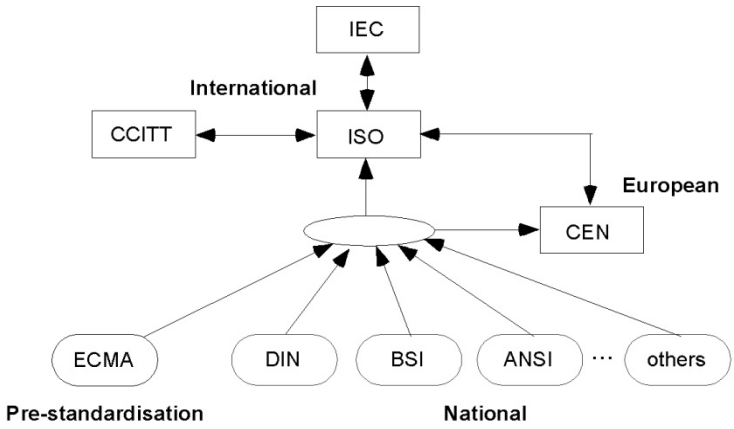

Figure 1: The ICT standardisation universe in the seventies (excerpt)

Over time, two trends contributed to an increasingly complex ICT standardisation environment:

- the growing importance of ICT,
- the globalisation of markets.

In a way, these were coupled, and further accelerated, by the Internet, which was 'discovered' for commercial use in the mid-nineties.

Further complexity was caused by the liberalisation of the telecommunications markets and the associated emergence of regional bodies, such as ETSI in Europe. This was reinforced by the still ongoing merger of the formerly distinct sectors of telecommunications and IT, which caused considerable changes in these markets [David, 1995]. These processes affected primarily SDOs and the relations between them. In addition, and as 'external' competitors, standards consortia emerged as a new phenomenon. Well-known examples today include, for instance, the W3C (the World Wide Web Consortium), OASIS (the Organization for the Advancement of Structured Information Standards), or OMG (the Object Management Group).

Also, the economic importance of standards grew. A system 'ennobled' by having become a standard held the promise of huge financial gains for its proponents. Likewise, backing a loosing system would imply both severe monetary losses and a severely reduced market share for its supporters. In an attempt to save the day, new consortia could be established to standardise the loosing system. Obviously, this approach increased the number of consortia and led to an even higher complexity of the standards setting environment. Additionally, it has been reported (Mora et al, in press) that while "… *the first standards were product-oriented (Tripp, 1996) (design and final product attributes, tolerances, specifications) and could be objectively assessed through testing and evaluation of the devices using physical instruments … however, the standards for processes convey additional difficulties for automatic assessment. Observations, records, interviews, analysis and questionnaires applied to core people on site are required. Furthermore, for the case of the software as a product/artefact, additional complications emerge. While the standard ISO 9126:1991 offers an initial solution here, its set of attributes still requires a final interpretation on how to measure them. Other sources of complexity are the time and the human resource performance variability in the certification of standards of processes*."

As a result, for a number of years consortia emerged an amazing rate [Cargill, 1995]. This was largely in response to the enormous speed of technical development in ICT and e-business systems. 'Traditional' SDOs were widely considered as not being capable of coping with this speed (see e.g., [Besen, 1995], [Cargill, 1995]; whether or not this view is justified is a matter of debate. For a slightly different view see e.g., [Sherif, 2003] and [Jakobs, 2002]). To further increase complexity, a proliferation of sector-specific standards may be observed in Europe, especially in the e-business domain. The most prominent representatives here include CEN/ISSS Workshop Agreements (CWAs), many of which have been tailored towards the needs of a dedicated industry sector. One effect, which was a direct result of the trends outlined above, is that many companies, especially large manufacturers, vendors, and service providers, are forced to participate in a much higher number of SSBs than they used to, to make sure that they do not miss a potentially relevant development (see e.g., [Updegrove, 2003]).

The Internet's standards body, the IETF (The Internet Engineering Task Force), should also be mentioned. This body plays a somewhat special role thanks to the unprecedented importance of the Internet in today's economy. For many years the IETF had not been accepted as a standards setting body, and its output, the Internet Standards, were not recognised by government procurement regulations [Werle, 2002]. This has changed by now, though.

Also, the IETF may be regarded as the role model for many large consortia, such as the W3C and OASIS, which have based their processes on that of the IETF. In fact, many have

considered the IETF's process as superior to those of the formal SDOs (see e.g., [Crocker, 1993], [Monteiro, 1995], [Solomon & Rutkowski, 1992]; see [Jakobs, 2003] for a maybe more objective discussions of this view.).

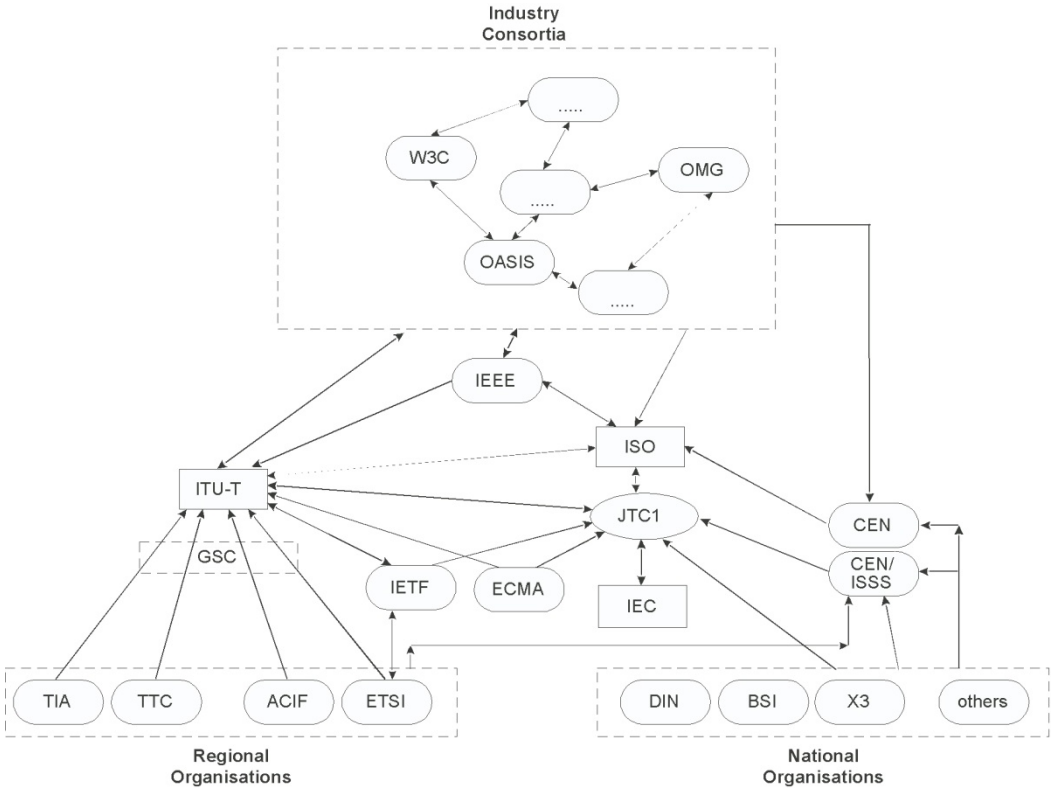

Figure 2: The ICT standardisation universe today (excerpt)

2.2. Evaluating Standards Setting

The complex environment outlined above represents a major challenge for those who are considering active participation in standardisation, as well as for those who are looking for standard that best suits their needs.

Considering this complexity of the IT standardisation universe, "Where to participate?" is a relevant question. Functionally equivalent systems may well be standardised in parallel by different SDOs and consortia, and participation in all relevant work groups is well beyond the means of all but the biggest players. The correct decision here is crucial, as backing the wrong horse may leave a company stranded with systems based on the 'wrong' (i.e., non-standard) technology. Succi et al (1998, p. 140) establish that "*standardization means that there is an explicit or implicit agreement to do certain things in a defined and uniform way*". Then, while standards convey an agreed mode to manufacturing a product, or the provision of a service, their vast number and the complexity of the web of SSBs, are extremely confusing, not only for practitioners. Because the acceptance of a standard is a large-scale project with critical financial, human and organisational resources to be committed by organisations, the selection of the correct standard (in technical and marketing views) is a relevant problem. In addition to the more practical aspects that need to be considered when selecting the best suited SSB for particular standards setting activity other, less tangible aspects may play a role in such decision processes, too. In particular, this may include the perceived reputation of an SSB. Perceptions of the importance and relevance of different types of SSBs differ widely.

For instance, Rutkowski offers a rather extreme point of view – "*The Internet standards development process is by far the best in the business.*" [Rutkowski, 1995]. However, things have changed since the times when the IETF on the one hand and ISO and CCITT on the other were basically the only players in the international ICT arena. These days, the IETF is one of a number of accepted members of the global web of standards setting bodies.

Likewise, the role of the national SDOs has changed. This holds particularly for Europe, where 90% of standards produced are European or international (as opposed to national; this ratio has changed dramatically within a couple of years) [Bilalis & Herbert, 2001]. Along similar lines, Ghiladi fears that "*... non-harmonized national standards and rules have the effect of erecting barriers.*" [Ghiladi, 2003].

Moreover, in an attempt to improve their position in the competition with consortia many SSBs have introduced 'new deliverables'. These are documents which do not have gone through the full-blown process that leads towards a 'Standard', but are more akin to the specifications issued by consortia (i.e., e.g., they require only a lower level of consensus, and can be published quicker). Obviously, this move has introduced further complexity into standardisation.

Many consortia and other SSBs outside the network of formal SDOs have established themselves as recognised sources of standards. Initially, though, their output was considered 'inferior' to that of the formal bodies, which had major repercussions, e.g. in (public) procurement (see e.g., [Heafner, 1988], [Werle, 2002]). Here, Europe's commitment to OSI in the 1980-90s was a remarkable example. In addition to its undoubted technical superiority, one of the major reasons why OSI standards were considered preferable to their Internet counterparts was the fact that ISO, where the OSI standards were developed, was a formal SDO, unlike the IETF, which was viewed with considerable suspicion.

Similar views could be observed in the private sector. A standards inventory project in the US petrochemical industry, for instance, established rules where "*... preference was given first to international standards, followed by national standards, and then consortium specifications.*" [Kowalski & Karcher, 1994].

Yet, by now Europe has recognised that: "*... consortia and fora are playing an increasing role in the development of standards, ... the European Standards Organisations have to recognise these facts and re-design policies, processes and organisational structures, in close collaboration with stakeholders and in particular industry ...* "[EC, 2004b], albeit with some concern: "*It is considered doubtful whether, in the light of the speed of development and the limited participation of experts, the fundamental principles for accountability of standardisation such as openness, consensus and transparency are followed in a robust fashion.*" ([EC, 2004a]; see section 4 for a sketch of the industry's view on this). Interestingly, this position has been challenged in [Egyedi, 2003], stating that democracy should not necessarily be required from consortia processes.

These diverse positions already hint at the currently ongoing discussion about the role of consortia in relation to European standardisation, and abut what exactly establishes an 'open standard'.

3. Co-ordination in Standardisation

Standardisation is basically a mechanism for co-ordination [Werle, 2001]. Not unlike the research sector, standards setting serves as a platform for co-operation between companies which are otherwise competitors. According to [Werle, 2001], a company has different options concerning standards setting:

- To try and bypass organised standardisation and set a de facto standard.
- To participate in the work of an official or a private standards organisation.
- To set up a new consortium or forum which deals with the standards project.

Assuming that standards setting work will eventually commence interests of the various stakeholders are likely to differ. That is, each participating organisation may try to either push its own ideas, propose a 'neutral' solution, or just try to impede the whole process in order to prevent any standard in the field in question. According to [Besen, 1995] four distinct situations are possible:

- Common interests
  There are no competing proposals, and a decision can quickly be reached by consensus. All parties involved attempt to serve the common good.
- Opposed interests
  Each opponent prefers his own proposal to be adopted, but would prefer no standard at all to the adoption of a competitor's proposal. This situation arises when the gains associated with the winning proposal are comparably big compared to the gains of the industry as a whole.
- Overlapping interests
  Again, each opponent prefers his own proposal to be adopted, but would rather have a competitor's proposal adopted than have no standard at all. This may happen if, conversely to the situation outlined above, the whole industry stands to benefit the most from the adoption of a standard (regardless from where it originated) rather than the original proposer.
- Destructive interest
  At least one player prefers not to have any openly available standard at all, and accordingly tries to slow down the process. This player typically is a major vendor largely dominating the market with a proprietary product who would lose market shares if a standard were in place.

This is pretty much confirmed by [van Wegberg, 2003], where a model of the standardisation process was developed which compares competing committees with what he calls a 'grand coalition'.

Obviously, the above alternatives all come down to the question of competition vs co-operation. The path towards competition may eventually lead to a company's dominating market position with a product or service based on their own proprietary specification. Yet, at the same time the virtual absence of other players may render this particular market insignificant. On the other hand, co-operation establishes a broader market for products or services based on open specifications, created through, and capable of accommodating, a number of different players. As has for instance been shown in [Swann, 1990], a product that succeeds in creating an environment in which other vendors consider it beneficial to produce compatible products will prove considerably more successful than its competitors. Such

compatible products can only emerge if the underlying original specifications have been made public, or if a very liberal licensing policy has been pursued. This example serves to highlight potential benefits to be gained from open specifications, even if the product itself is inferior to its (less open) rivals in terms of functionality provided. Here, the range of products compatible to the original specification strengthen its status as a de-facto 'standard', which in turn triggers the development of even more compliant products [Swann, 1990]. As a result, a bigger market has been established, leading to increased revenues.

3.1.State-of-the-Art

Today, various forms of co-operation between SSBs may be found. In the realm of SDOs, 'horizontal' co-operation between the international SDOs (ITU, ISO, IEC) is regulated by a dedicated guide for co-operation between ITU-T and JTC1. This document specified different forms of co-operation, but also makes it very plain that "*By far, the vast majority of the work program of the ITU-T and the work program of JTC 1 is carried out separately with little, if any, need for cooperation between the organizations*".

Similarly, the CEN/CENELEC/ETSI Joint Presidents' Group (JPG) co-ordinates the standardisation policies of the ESOs based on a basic co-operation agreement. Moreover, the Directive 98/34/EC mandates that conflicting standards have to be withdrawn. This is managed 'horizontally' the ESOs, and 'vertically' by their members, the NSOs.

'Vertical' co-operation between ESOs and the international bodies is governed by individual documents. Here, the major need for co-operation and co-ordination is primarily sector-specific (IT, Telecom; see Figure 3).

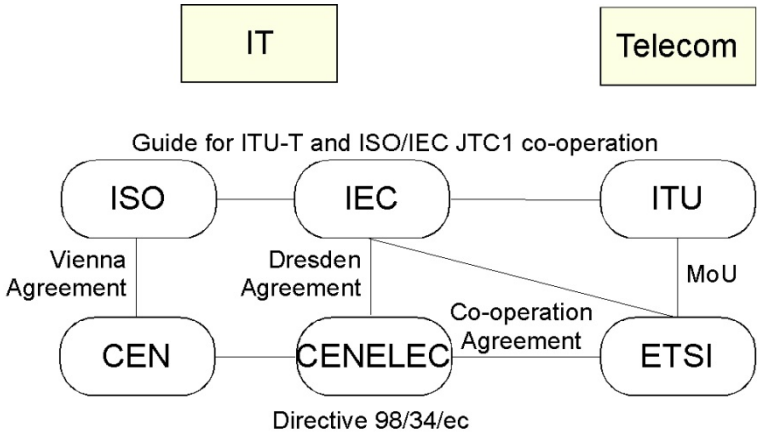

Figure 3: Co-operation and co-ordination agreements between European and international SDOs

The 'Vienna Agreement' provides the rules for co-operation between CEN and ISO; analogously, the 'Dresden Agreement' governs relations between IEC and CENELEC. Somewhat surprisingly, only a rather more informal Memorandum of Understanding (MoU) exists for the co-operation between ETSI and ITU. On the other hand, and also a bit unexpected, a dedicated agreement guides the relations between ETSI and IEC.

In general, the 'vertical' agreements and MoUs define various levels of co-operation and co-ordination, albeit in comparably vague terms. Nonetheless, co-operation between CEN and ISO, and CENELEC and IEC, has been very successful in many cases, primarily through joint working groups. In contrast, the documents governing the respective 'horizontal' co-

operations are far more rigorous. This holds particularly for the European Directive that regulates the relations between the three ESOs.
The Global Standards Collaboration (GSC) covers both vertical (between regional telecommunication standards bodies and the ITU) and horizontal co-ordination (between regional telecommunication standards bodies). It provides for the regular exchange of work programmes and other information between its members. However, it is likely that the progressing merger of the IT and telecommunications sectors will pose additional problems in this respect, such as, for example, the need to include new members (from the IT sector).

ETSI Partnership Projects represent a different, albeit related approach to co-ordination. Covering both SDOs and consortia, such projects co-ordinate a group of regional SDOs and industry consortia working towards a common objective. The '3rd Generation Partnership Project' is the most prominent example.

In the e-business sector, a specific MoU exists between ISO, IEC (the 'parent' organisations of JTC1), ITU, and UN/ECE [MoU, 2000]. In addition, a number of organisations have been recognised as participating international user groups. The MoU it aims to minimise the risk of conflicting approaches to standardisation, to avoid duplication of efforts, to provide a clear roadmap for users, and to ensure inter-sectoral coherence. Most notably, its 'division of responsibilities' identifies a number of key tasks and assigns one of the four signatories to each of them.

Overall, the co-ordination of the work of the SDOs appears to be reasonably well organised. This does not necessarily hold for the co-ordination between SDOs and consortia. Numerous co-operations do exist, however, the current situation can be best described as piecemeal; there is no overarching framework to organise the individual co-operations.

An initiative taken by the three ESOs is a promising development. The ICT Standards Board (ICTSB) aims to co-ordinate specification activities in the field of Information and Communications Technologies. In addition to the ESOs, the ICTSB membership comprises major standards consortia. It's objectives include:

- The analysis and co-ordination of requirements on standardisation.
- The translation of these requirements into standardisation programmes or projects.
- The allocation of work to the most appropriate specifying body (SDO or consortium).

With respect to the co-ordination between individual consortia the situation is even worse. Here as well co-operations occur rather more at the level of technical bodies (if at all) than at SSB level. In most cases, however, the world of standards consortia experiences more competition than co-operation. There is direct competition between consortia covering similar ground, for instance, between RosettaNet and ebXML, and between the Semantic Web Services Initiative (SWSI) and the W3C.

3.2. Improving the Situation

To develop "*... procedures by which the needs of consortia can be better accommodated in ESOs. ESOs should fully exploit the potential for synergies by improving their co-operation and reinforce their mechanisms of coordination for subjects of common interest*" [European Commission, 2004b], several routes could (and should) be followed.

- Strengthen existing co-ordination activities.

Initiatives such as the MoU on e-business standardisation and the ICTSB should be encouraged to involve more SSBs and other relevant organisations. Also, for standardisation in the e-business sector, it would be helpful if the ICTSB established a dedicated Working Group for e-business, to co-ordinate the relevant activities of its members.

- Develop new forms of co-operation between SDOs and consortia.
  In the light of increasingly similar membership, processes, and IPR regimes of major consortia and SDOs it would make sense to extend to major consortia those forms of co-ordination and co-operation already in place between SDOs. These may take on the form of, for example, mutual exchange of documents and work programmes, exchange of observers, the right to submit input, and joint working groups.
  Also, the PAS and fast-track procedures offer useful mechanisms to improve co-operation between SDOs and consortia. Coupled with a suitable division of labour (see below) better exploitation of these mechanisms could safe considerable time and effort. This would, however, require pro-active 'marketing' of these mechanisms to consortia (after all, they will need to benefit from it as well).
- Identify a suitable division of labour between SDOs and consortia.
  A division of labour between 'infrastructure' and 'applications' would be beneficial. Given the diverse characteristics of infrastructure technologies and applications on the one hand, and of SDOs and consortia on the other, the former should focus on standards for a long-lived infrastructure, while the latter should concentrate on standards for the more dynamic sectors, e.g. on e-business applications.

4. Some Concluding Remarks

The standardisation environment in the ICT/e-business sector has been undergoing significant changes over the last couple of years. Arguably the most important development has been the proliferation of standards consortia, largely created out of frustration about the 'formal' standards setting process, and typically driven by one, or a group of, major industry players. At least in the early days of this development consortia were widely considered as being more efficient, and more oriented towards the needs of the industry. The time-to-market of their specifications, and consequently, of the products based on them, were also said to be vastly superior to those of SDOs. These specifications did not have to go through a cumbersome and often time consuming wide consensus process. Moreover, consortia's' working groups were supposed to be far less influenced by politics and/or private agendas, as everyone was supposed working towards an agreed common goal.

It seems, however, that this initial enthusiasm has somewhat faded over time. Ironically, one reason for this was the increasing importance of consortia. In many areas their specifications have become way more important than those of the SDOs (if they can be bothered to produce anything at all, that is). For example, for quite a while the W3C almost held a monopoly on standards for the World Wide Web (this has changed with the advent of new consortia covering similar ground).

Also, faced with the new competition, the established SDOs 'fought back', new deliverables being their major 'weapon' here. That is, in order to better compete with consortia, and in what must be considered an attempt to mimic the rules and processes of the major consortia, most SDOs introduced 'lightweight' processes, leading to specifications with a lower required level of consensus. These specifications do not go through the full consensus forming process as the formal 'norms' do, and are thus more akin to the deliverables of the

consortia. Typical examples here include ISO's 'Technical Reports', ETSI's 'Technical Specifications', and the CEN/ISSS 'Workshop Agreements'.
On the other hand, the processes of some of the major consortia (notably OASIS and W3C) can hardly be distinguished any more from those of the SDOs. In fact, in a way the W3C's requirement for royalty free licensing of IPR which is incorporated is surpassing those of all formal SDOs (which typically require 'reasonable and non discriminatory' licensing).

In consequence, we can observe a convergence of the two formerly separated 'standards worlds'. This is not to say that competition has stopped, but it is becoming increasingly hard to distinguish many consortia and SDOs based on their processes and outputs.

Still, the current environment forces companies with a business interest in the ICT sector (i.e., primarily large vendors and service providers, but also leading-edge users) to participate in a vast variety of SSBs (for example, HP and Sun each are involved in around 150+ SSBs [Updegrove, 2003]). This is certainly an undesirable situation, and a higher level of co-ordination between consortia, and consortia and SDOs would be highly desirable. The latter could be achieved through an adequately flexible and speedy transposition process, and/or through a division of labour, whereby long-lived 'infrastructural' technologies would be dealt with by the SDOs through their 'traditional' process, and short-lived other technologies would be within the realm of consortia and the SDO's New Deliverables. The sequentiality between infrastructure and subsequent applications and services have also to be taken into account in the standardisation activities of SDOs and consortia and their co-ordination efforts.

This changing landscape has major ramifications for (European) policy makers as well. European policy makers still consider SDOs (especially the European Standards Organisations, ESOs) as superior to consortia. Unfortunately, this is not just a minor side issue – standards are referenced in procurement documents and in European Directives. Accordingly, the largely unreflected categorisation SDOs vs consortia represents a severe disadvantage for the (products of) the latter. To make things worse, moves seem to be under way to 'ennoble' some of the ESOs new deliverables here as well, i.e., to consider them as on par with full-blown 'norms'. In the light of the findings and discussion above this would be a very questionable move if it actually happened.

To summarise: competition between SSBs prevails – this holds for both consortium vs consortium and consortium vs SDO. Policy makers could do something about it by encouraging both camps to improve co-operation or at least co-ordination. Whether or not this is going to happen anytime soon remains to be seen. For the time being, it appears that at least in Europe policy interest is almost exclusively focussed on the ESOs.

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