Preface

THE EUROPEAN UNION’S ICT STANDARDISATION POLICY: CHANGES AHEAD!?  

Introduction

During the past three decades, two trends contributed to an increasingly complex ICT standardisation environment:

• the growing importance of ICT¹, and the associated economic importance of standards
• the globalisation of markets.

These were coupled, and further accelerated, by the Internet, which was ‘discovered’ for commercial use in the mid-nineties. As one result of this discovery, bring own ideas, views, and technologies into the Internet’s standards setting process became a major issue for ICT companies.

Further complexity was caused by the liberalisation of the telecommunications markets and the associated emergence of regional bodies, such as ETSI² in Europe, and ATIS³ in the US and TTC⁴ in Asia. 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).

In addition, and as ‘external’ competitors, standards consortia emerged as a new phenomenon (especially in the IT sector, not so much in telecommunication). This was largely in response to the enormous speed of technical development in ICT and e-business systems. ‘Traditional’ SDOs – including the European Standardisation Organisations (ESOs) – were widely considered as not being capable of coping with this speed. Well-established consortia include, for instance, the W3C⁵, OASIS⁶, or OMG⁷.

By now, a huge number of consortia and industry fora have entered the ICT (Information and Communication Technology) standards setting arena. 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, however, we may observe fierce competition in standards setting. Initially, in the eighties consortia invaded the standardisation territory, which had always been the ‘formal’ standards bodies’ (SDOs⁸) monopoly. This move was also helped by the deregulation of the telecommunication sector. Eventually, the SDOs started fighting back. As a result, these days competition may occur between
working groups of different SSBs, and between entire SSBs which cover largely the same ground. In addition, though, WGs of the same SSB may also compete. The SDOs are finding it increasingly difficult to do relevant work in such a competitive environment. Especially human resources are scare, and apparently many companies find it more rewarding to send their staff to consortia’s working groups rather than SDOs’ committees. And given the inherently global nature of most ICT standards, regional bodies may look like an anachronism to some. This holds particularly for Europe. Here, a well-established standardisation system is in place that is now struggling to keep a high profile in the ICT sector.

The remainder of the paper will first provide some necessary background information. Thus, section 2 will have a look at how the current ICT standardisation environment emerged, and discuss some its characteristics. The various co-operation mechanisms that are in place in standards setting will be described in section 3, for both the international and the European level. This will be followed, in section 4, by a closer look at problems specific to the European Union. Finally, some brief final remarks will be given in section 5.

The Emergence of the Current Standardisation Environment

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. Back then 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.

With the increasing importance of ICT, the economic importance of standards grew as well. 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.

Figure 1. The ICT standardisation universe in the seventies (excerpt)
As a result, for a number of years consortia emerged at 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 (Besen, 1995), (Cargill, 1995). 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 (The European Committee for Standardization) Workshop Agreements (CWAs), many of which have been tailored towards the needs of a dedicated industry sector.

One effect, which is 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, in order to make sure that they do not miss a potentially relevant development (Updegrove, 2003).

The Internet’s standards body, the IETF (The Internet Engineering Task Force), 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 (Crocker, 1993), (Monteiro, 1995), (Solomon & Rutkowski, 1992).

Eventually, the highly complex web of SSBs we are seeing today emerged, part of which is depicted in Figure 2.

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

Figure 2. The ICT standardisation universe today (excerpt)
Considering this complexity of the IT standardisation universe, “Where to participate?” is a relevant question for those who wish to actively contribute to standards setting. 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.

In addition to the more practical aspects that need to be considered when selecting the best suited SSB for a 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 little else but 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, 2003). 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 thus 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. This had major repercussions, e.g. in (public) procurement (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 by many.

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). 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.

**Coordination at SSB Level: State-of-the-Art**

**The International Level**

The increasingly complex web of SSBs, in conjunction with the equally increasing inter-dependencies between different ICT systems, and between applications and ICT infrastructure, imply an urgent need for co-operation and distribution of labour between the SSBs active in ICT standardisation.

Today, various forms of co-operation between SSBs may be found. In the realm of SDOs, ‘horizontal’ co-operation between the international SDOs is regulated by a dedicated guide for co-operation between ITU-T and JTC1\(^\text{16}\) (ITU, 2001); see also Figure 3. This document specifies different forms of co-operation, including, in order of level of co-ordination, ‘liaison’, ‘collaborative interchange’, ‘collaborative team’. However, the document 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”.

The Global Standards Collaboration (GSC; see Figure 2) 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).

In the e-business sector, a specific MoU (ITU, 2000) exists between ISO, IEC (the ‘parent’ organisations of JTC1), ITU, and UN/ECE (United Nations Economic Commission for Europe). A number of additional organisations have been recognised as participating international user groups, [including, e.g., OASIS, CEN/ISSS, and SWIFT (Society for Worldwide Interbank Financial Telecommunication)]. The objective of the MoU is to encourage interoperability. To this end, 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

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**Figure 3. Co-operation between SDOs at the international level**

![Diagram of SDO co-operation]

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number of key tasks and assigns a lead organisation (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.17

This does not necessarily hold for the co-ordination between SDOs and standards 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. The MoU on e-business standards is a good initial step, but its coverage in terms of organisations involved is still rather limited. In this context, the move of UN/CEFACT (United Nations Centre for Trade Facilitation and Electronic Business) to ‘outsource’ ebXML related activities to OASIS is a notable move, as it represents a unique form of co-operation between an ‘official’ body and a standards consortium.

‘Publicly Available Specifications’ (PAS) represent a different, yet highly relevant co-ordination mechanism. The ISO directives state that “... constitutional characteristics of the [PAS-submitting] organisation are supposed to reflect the openness of the organisation and the PAS development process.” (JTC1, 2004). The PAS procedure is a means for JTC1 to transpose a specification more rapidly into an international standard. The specification starts out as a Draft International Standard (DIS), which, if approved by JTC1 members, immediately acquires the status of an International Standard (IS). This mechanism has primarily been designed to enable JTC1 to transpose specifications that originated from consortia into international standards. In this capacity it also serves as a mechanisms to at least contribute to co-ordination of work done within consortia and the world of formal SDO.

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.

The European Standardisation Landscape

The European Standardisation system comprises three ESOs. Of these, ETSI is in charge of telecommunication standardisation, CENELEC is working in the field of electrotechnical standardisation, and CEN basically covers all other topics. The system is very much based upon the international system, and close links exist between both systems (see Figure 4).

The European Standards Organisations’ (ESOs) Joint Presidents’ Group (JPG) co-ordinates the standardisation policies of the ESOs based on a basic co-operation agreement (CEN, 2008). Five different modes of co-operation have been defined, including ‘Informative relation’, ‘Contributive relation’, ‘Sub-contracting relation’, ‘Collaborative relation’, and ‘Integrated relation’ (CEN, 2008). Moreover, the Directive 98/34/EC (European Commission, 1998) mandates that conflicting standards have to be withdrawn. This is managed internally by each ESO, between the three bodies (through cross-representation at General Assemblies and co-ordination bodies), and ‘vertically’ with their members, the NSOs.

‘Vertical’ co-operation between ESOs and their respective international mirror bodies is governed by individual documents. Here, the major need for co-operation and co-ordination is primarily sector-specific.

The ‘Vienna Agreement’ (ISO, 2001) provides the rules for co-operation between CEN and ISO; analogously, the ‘Dresden Agreement’18 governs relations between IEC (International Electrotechnical Commission) and CENELEC (European Committee for Electrotechnical Standardization). Somewhat surprisingly, only a rather more informal Memorandum of Understanding (MoU) exists for the co-
operation between ETSI and ITU\textsuperscript{19}. On the other hand, and also a bit unexpected, a dedicated agreement guides the relations between ETSI and IEC\textsuperscript{20}.

In general, the ‘vertical’ agreements and MoUs (i.e., those between ESOs and the international bodies) 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.

ETSI Partnership Projects\textsuperscript{21} 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’ (3GPP) is the most prominent example.

An initiative jointly taken by the three ESOs is another 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, ICTSB membership comprises major standards consortia (including, for example, ECBS (the European Committee for Banking Standards), ECMA International\textsuperscript{22}, OASIS, the Object Management Group, RosettaNet, The Open Group, and the World Wide Web Consortium. The ICTSB’s objectives include\textsuperscript{23}:

- 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).

Thus, its approach is quite similar to the one adopted by the MoU on e-business standardisation, albeit broader in scope.

The Global RFID Interoperability Forum for Standards (GRIFS) represents yet another approach to co-ordination. GRIFS a project funded by the European Commission with the aim “to improve collaboration and thereby to maximise the global interoperability of RFID standards” (GRIFS, 2008). The GRIFS project is co-ordinated by GS1, ETSI and CEN. It will initiate a forum that will continue to
work after the end of the project through a Memorandum of Understanding between key global standard organisations active in RFID.

European ICT Standardisation Problems

A Bit of Background

A number of likely changes in the ICT landscape in the not-too-distant future will (have to) have significant repercussions on the EU’s standardisation policy. For example, just like liberalisation of the telecommunication market and the merger of the IT and telecommunication sectors caused significant changes to the standards setting environment, the future merger of broadcast and ICT will contribute to even further changes. These will be all the more important as standardisation will also have a direct impact on the consumer (as signified, for example, by the prevailing uncertainty about future TV standards and their implementation).

The emergence of China as a new powerful player in the ICT arena represents another major development to be taken into account. This holds all the more, given the many unresolved IPR-related issues which still seem to overshadow China’s role in (ICT) standards setting. In any case, an EU standardisation policy will need to deal with this emerging potent and robust player.

Nearer to home, the role of standards in support of legislation will have to be re-established. Currently, only standards issued by the ESOs (strangely also including some ‘New Deliverables’) are referenced in European Directives, policy documents, and in public procurement. Yet, with the increasingly blurred distinction in terms of processes between ESOs and at least some of the major industry consortia [like OASIS or W3C; see, for example, (Jakobs, 2006)], it seems questionable whether this focus on ESO deliverables can, and should, be maintained in the future. The same holds for the role of standards in public procurement processes.

More generally, the relation between ESOs on the one hand and the international bodies and industry consortia, respectively, on the other will have to be re-evaluated. While ESOs are most helpful in dealing with specifically European needs in ICT standardisation, they also represent a somewhat artificial construct, given that most ICT standards are international by their very nature.

Likewise, the overlap of activities going on in both ESOs and in consortia needs to be minimised in order to not waste scarce resources and, more importantly, to ensure interoperability. Here, new ways need to be found to ensure an adequate level of co-ordination and co-operation between ESOs and consortia, but also between the three ESOs.

Another aspect, which may be potentially dangerous in the longer term, refers to the typically unbalanced participation of the different stakeholder groups in ICT standards setting. Different considerations are of importance here. For one, according to recent studies (e.g., Egyedi et al. 2003, Jakobs, 2004, Gerst & Jakobs, 2005, Blind, 2006), SMEs are still dramatically under-represented in both international and European standardisation. Given that SMEs account for 99% of European companies, and provide some 75 million jobs, this is not a sustainable situation. The same holds for consumers, for whom the situation is even worse. Here, adequate measures will have to be implemented to achieve a more balanced participation of all groups of stakeholders where necessary and beneficial.

The same holds for the participation of consumer representatives in ICT/e-business standards setting. In fact, consumers are hardly represented at all in ICT standardisation (with exceptions, thanks largely to ANEC). Yet, many ICT standards directly impact consumers (e.g., those relating to e-inclusion). This
will hold all the more with the merger of ICT and broadcasting. Thus, for these standards contributions also from the consumer side would be valuable.

Against this background, and especially with a view at the proliferation and increasing importance of standards consortia, concerns have grown for quite a while now about the (future) relevance of the European ICT standardisation system. Similar earlier concerns – and the wish to get rid of the (perceived) reputation of being slow moving and not really up to the job – had already led to the introduction of ‘lightweight’ deliverables by the ESO. This time, however, the whole EU ICT standardisation policy is being questioned.

Identified Issues

A report was commissioned in 2006 by the European Commission with the mandate to analyse the state-of-the-art in European ICT standardisation policy, and to provide recommendations on how to adapt it in the future (CEU, 2007). This report observes that various trends, many of them home-grown, are likely to contribute to a reduced importance of SDOs in general, and of the ESOs in particular (compared to standards consortia). According to (CEU, 2007) and (EU-China, 2008), these include, among others:

- **Internal legal issues.** EU legislation (and, to a lesser degree, public procurement) can only reference standards produced by the ESOs. In particular, no standards developed by standards consortia or fora (like, for example, the W3C, OASIS, or OMG), as well as those developed by the IETF, IEEE and the likes may be referenced. Closely related to that is a
- **Lack of adequate European standards.** EU regulation, legislation and public procurement cannot reference many state-of-the-art standards solely because they have been developed by the ‘wrong’ standards setting bodies (SSBs; i.e., not by one of the ESOs).
- **Lack of integration of standards consortia.** Here, the prevailing stance remains that “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 [by industrial fora and consortia]“ (CEU, 2004).
- **Lagging European efforts.** In the ICT standardisation area, EU work is lagging a long way behind market realities. This is not least due to the policies and cumbersome processes deployed by the ESOs (specifically CEN and CENELEC).
- **Lack of adequate links to the R&D community.** The political support is largely limited to indirect support to pre-standardisation. In addition, some dedicated projects looking at the link between R&D and standardisation have been funded.
- **Increasing influence of Asian countries, most notably China.** China has recognised the potential of actively pursuing ICT standardisation. This is done on two levels: through the development of national standards, and through strong participation in the international arena (primarily in formal bodies, though, as opposed to consortia).

Envisaged Potential Remedies

To do something about especially the first four issues, the EU needs to re-consider their stance towards non-European SSBs. Specifically, four potential lines of action have been identified (CEU, 2008):
1. No action at all at EU level.
2. Modest changes to European ICT standardisation policy, e.g.
   o create a permanent stakeholders’ platform,
   o encourage deeper integration of the work of consortia / fora into the European standardisation system through agreements with the ESOs.
3. Significant changes to European ICT standardisation policy, e.g.
   o create the financial and legal possibility to reference non-ESO ICT standards in EU policies and legislation,
   o define ICT standards attributes based on WTO criteria,
   o use specific standards developed by particular consortia/ fora (‘case by case basis’),
   o clarify the provisions applicable to the use of ICT standards in public procurement.
4. Comprehensive changes to European ICT standardisation policy, e.g.
   o recognition / accreditation of fora and consortia as standardisation organisations under Directive 98/34,
   o regulate the treatment of IPR related to ICT standards”.

Given the issues listed above (and the numerous others), #1 is hardly an option.

The same holds for option 2. An entity that could easily assume the role of the suggested platform has already been established – the ICT Standards Board (ICTSB). Whether or not consortia actually want to be integrated more deeply into the European standardisation system appears questionable – why should they?

Option 4 would probably bring about a whole host of legal problems that would take considerable time and efforts to be fully resolved. Moreover, given the very diverse policies and bylaws of individual consortia, a ‘carte blanche’ approach here would not be feasible (see below).

This leaves #3 as the only viable option. The WTO has identified a ‘Code of Good Practice for the Preparation, Adoption, and Application of Standards’ (WTO, 2000). Compliance with this Code would thus be a minimum requirement for consortia to be accepted as potential sources of officially ‘referenceable’ standards in the EU. It might, however, be advisable to identify additional criteria that should be met by consortia (e.g., about their openness, membership policies, IPR rules, etc). This option should also be implementable with an acceptable degree of legal/administrative overhead.

**Some Very Brief Final Remarks**

The EU ICT standardisation system is closely connected to the system of international standardisation bodies. Its success within this international context is challenged by various competitors. As far as the ‘formal’ bodies are concerned, this holds particularly for China. This country is adopting a rather aggressive stance in the attempt to push indigenous technology into international standards. In addition, standards consortia have already marginalised SDOs in many areas of the ICT sector (such as, for example, the Internet, the World Wide Web, and e-business).

Any policy measures to promote the results of the EU’s ICT standardisation have to take into account that the most important ICT consortia standards are developed already at a global level. Also, global standards facilitate trade and thus have a strong impact on a country’s or region’s export performance. Consequently, there is a need for EU actors to be adequately involved in international standardisation
processes, in the relevant bodies. The development of strategies to transfer EU ICT standards the international level is crucial in order to gain a competitive advantage.

Since the technological race is becoming faster in the ICT sector, European standards have to be established early and the results should be promoted world-wide. Such international standards based on European input would, however, also enable foreign competitors to imitate European ICT products and systems. This, in turn, will require a well defined co-ordination of European IPR policies. Furthermore, international standards are a mode of efficient technology transfer in ICT technologies. The European ICT sector can benefit here in those fields in which other regions are in the lead by immediately adapting the respective standards.

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REFERENCES


ENDNOTES

1 Information and Communication Technologies.
2 The European Telecommunications Standards Institute.
3 The Alliance for Telecommunications Industry Solutions.
4 The Telecommunication Technology Committee.
6 The Organization for the Advancement of Structured Information Standards.
7 The Object Management Group.
8 Standards Developing Organisations, i.e., the ‘formal’ bodies like e.g. ISO and ITU at the global level, CEN and ETSI at the European level, and the various national bodies.
9 For instance, in the 80s the IEEE groups 802.3/4/5 worked on competing technologies for local area networks. Eventually, Ethernet (802.3) won.
10 International Telegraph and Telephone Consultative Committee, the predecessor of the ITU-T.
11 Post, Telegraph and Telephone administration (typically the national monopolies).
12 The International Organization for Standardization. Please note that ISO is not an acronym, it is derived from the Greek word isos, meaning ‘equal’.
13 Some related activities were also carried out within IEC, the International Electrotechnical Commission.
14 Whether or not this view is justified is a matter of debate. For a slightly different opinion see e.g., (Sherif, 2003) and (Jakobs, 2002).
15 See (Jakobs, 2003) for a perhaps more objective discussions of this view.
16 Joint Technical Committee One, a committee run jointly by IEC and ISO, covering all IT-related sectors.
17 There have been exceptions, though, which need to be avoided in the future. For example, the IEEE 802.11a/b/g activities and ETSI’s HIPERLAN/2 covered the same ground and were in direct competition (ETSI ‘lost’).
18 http://www.ietc.ch/about/partners/agreements/cenelec-e.htm.
21 “Where appropriate, ETSI will base its activities on Partnership Projects committed to basic principles such as openness, clear Intellectual Property Rights (IPR) policy and financial co-responsibility, to
be established with partners of any kind (global and regional, Standards Development Organizations (SDOs) and Fora, etc.)” http://www.etsi.org/etsi_galaxy/worldwide/partnership/partnership_a.htm.


23 Like the ‘CEN Workshop Agreements’ and ETSI’s ‘Industry Specifications’.

24 As Chinese officials like to say: third-class companies make products; second-class companies develop technology; first-class companies set standards.

25 The ICTSB is an initiative from the three ESOs with the participation consortia including, among others, the W3C, ISOC, and RosettaNet to co-ordinate specification activities in the field of ICT.