

SUCCESS IN ICT STANDARDS SETTING – A CLOSER LOOK AT SOME INFLUENCING FACTORS –

Kai Jakobs
RWTH AACHEN UNIVERSITY

In the field of Information and Communication Technologies, standards are of overriding importance. Accordingly, much has been written about their economic impact. Yet, comparably little is known about how firms manage their standardisation activities. This paper develops a framework as a basis for both practitioners and researchers to get a better understanding of how to improve a firms' performance in ICT standardisation. To this end, I offer a closer look at the major types of actors – firms, standards bodies and individual standards setters and at the links and similarities that exist between a firm's strategic behaviour in a market and its approach to standardisation. These aspects are integrated to form a framework for future research and practical deployment.

A. Introduction, Motivation and Background

Today, virtually all Information and Communication Technologies (ICT) systems are based on standards. Thus, standards now under development will be an integral part of future ICT systems, and will to no small extent define their functionality. In a way, this gives those who actively contribute to standardisation the opportunity to pro-actively shape these future systems; a tempting prospect for some. Thus, it is little surprise that manufacturers of systems or components and service providers are among those with the highest interest in shaping ICT systems to make them meet their respective requirements. Depending on the stakes individual companies have in a new technology they will adopt different approaches to its standardisation. These may range from no participation at all to attempts to dominate the standards setting process to the greatest extent possible, with various levels of interest and involvement in between.

While perhaps not always a matter of life or death success in standardisation may well have a significant impact on the economic well-being of a company. This impact may materialise through different channels. For example, a proprietary technology may be 'ennobled' by becoming a standard. Also, an organisation may capitalise on its Intellectual Property that has been incorporated into a standard and for which royalties may be demanded. Perhaps less obvious, but in many cases at least as important, a standard may help extend existing markets or even open up new ones (see e.g. [APEC Secretariat, 2010] or [den Uijl et al, 2013]). On the more negative side, backing the wrong horse by e.g. positioning a proprietary technology against an eventually successful standard may have severe ramifications in terms of lost market shares and diminishing revenues.

The outcome of a standards setting process does not just depend on the efforts of an individual firm (or a group thereof). Rather, a number of both internal and external (to the company) factors play a role. With respect to the latter, aspects to be considered include, for example, the characteristics of potentially relevant Standards Setting Organisations¹ (SSOs), the identities, capabilities and ideally strategies of potential adversaries and allies, and the needs and requirements of the different stakeholders and potential users. Factors relating to the former include, among others, a clear alignment of standardisation activities with (sectoral) business strategies, an in-depth knowledge of the standardisation environment and an adequate management of all standardisation activities². To be successful in standardisation, a company needs to take all these influencing factors into account. A firm can make sure that the 'internal' factors are appropriately being dealt with (e.g. define a

¹ This term is used to denote both formal Standards Developing Organisations, and private standards consortia.

² The 1990s saw a bit of a hype surrounding 'Strategic Standardisation Management' (SSM). This is "A management discipline and methodology that investigates all aspects of standardization across a business and/or industry, then defines, recommends, and implements appropriate strategies and policies to leverage standardization so that a firm can gain competitive advantage and avoid disadvantage" [Betancourt & Walsh, 1995]. At that time, the American National Standards Institute (ANSI) ran the 'Center for Strategic Standardization Management' to assist companies that aimed at adopting this approach. These days, the interest in SSM seems to have all but vanished; a half-day course on the topic (offered by ANSI) is all that can be found on the Web these days (and even this course apparently won't be offered in 2013). even this course apparently will not be offered in 2013). Yet, the ideas underlying – and comprising – SSM remain valid.

standardisation strategy that supports the business strategy) but has only limited control over the ‘external’ factors (or none at all).

A number of these external factors emerge directly from the – rather complex – ICT standardisation environment as it presents itself today to companies (and other stakeholders) wishing to become active in ICT standards setting. These companies may be expected to have very different requirements with respect to e.g. the actual SSO, its processes, IPR guidelines, membership, liaisons and bylaws. Most of these requirements will result from the respective immediate needs for standardisation. In many cases, these requirements, in turn, will emerge from an underlying standardisation strategy. In several cases, this strategy will have been devised in support of a firm’s (sectoral) business strategy. This direct link between business strategy and standardisation strategy suggests to also take into account a firm’s characteristics (e.g. a perceived or envisaged role in a specific market or sector) when looking at the different factors that foster, or hamper, a firm’s successful contribution to ICT standards setting. This will yield an initial framework that should, on the one hand, help standardisation researchers to get a clearer picture of the factors influencing the standards setting process. On the other hand, it should contribute to corporate standardisation efforts becoming more successful.

The remainder of the paper is organised as follows. Setting out from a very simple and basic model section 2 will successively introduce a number of factors and boundary conditions that have an impact on the standardisation process. Section 3 will then have a closer look at the major actors in ICT standardisation – the firms, the standards bodies and the individual standards setters. Finally, Section 4 will try and put everything together to form a coherent framework.

B. Aspects Influencing Standardisation

A standard is the result of a standardisation process. This process, in turn, is subject to the influence of a number of different factors. In particular, a broad variety of stakeholders exert an influence of various degrees (see Fig. 1 for a simplifying illustration). In the following I will first have a brief look at the range of stakeholders that impact standards setting and the associated processes through which this influence is exerted. This discussion will eventually lead to a refinement of Figure 1.

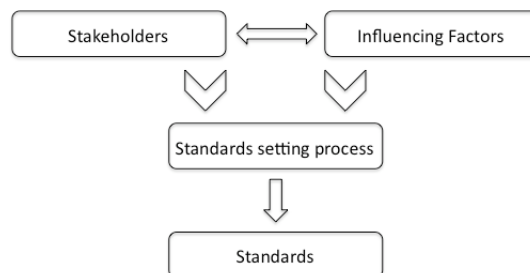


Figure 1: A Very simple view of what influences a standard

C. The Stakeholders

This section will provide some more details about three groups of stakeholders, companies, SSOs and individuals. The focus here will be on those aspects that are relevant for standardisation management.

1. Companies

Categorising Organisational Strategies

A very popular categorisation of organisational strategies was introduced by Miles and Snow [1978]. They identify four types of organisations – ‘Prospectors’, ‘Analysers’, ‘Defenders’ and ‘Reactors’. Each of these types can be characterised along three lines (see also Figure 2):

- Entrepreneurial
Refers to the choice of the product/service – market domain and methods of competition.
- Engineering
Refers to the choice of technology used to implement the methods of competition.
- Administrative
Refers to the choice of organisational structure and processes to reduce internal uncertainty and to align the organisation with its environment.

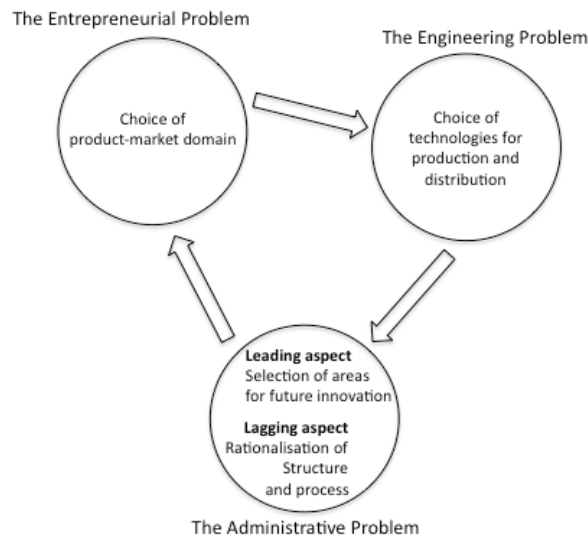


Figure 2: Corporate Characteristics (adopted from [Miles & Snow, 1978])

The types of organisations may then be described as follows:

- **Prospector**
A Prospector is innovative and growth oriented, searches for new markets as well as for new products and services and is prepared to take risks. Its product/service domain is rather broad and changes over time. A Prospector relies on multiple technologies to stay flexible and adaptive; it adopts a decentralised organisational structure.
- **Analyser**
The Analyser tries to strike a balance between the search for new product/service opportunities and a stable set of offerings. That is, part of its domain is stable and part is in a state of flux. The technology deployed reflects this dualism in order to be able to serve both domains, as does its organisational structure.
- **Defender**
A Defender aims to maintain its current markets and its limited set of products and/or services to the satisfaction of its customers. It has only a moderate emphasis on innovation. To this end, its core technology is highly cost efficient and the organisational structure is centralised.
- **Reactor**
The Reactor's strategy is inconsistent or ill defined; it is not really equipped to respond to environmental changes. It may try to assume the role of a defender, prospector or analyser albeit mostly unsuccessfully. It may also try to switch between these roles too frequently.

Categorising Strategic Approaches to Standardisation

Firms' characteristics vary with respect to e.g. size, business sector, or business strategy, etc. Accordingly, their needs for, the perceived importance of, and ability to, influence standards will vary as well. Frequently, companies active in ICT standards setting are classified along their respective type of business (like 'vendor', 'service provider' or 'user'; see e.g. [Jakobs et al., 2001] or ETSI's membership categories). Complementing this, the distinction between 'SMEs' (Small and Medium-sized Enterprises) and 'Large companies' may also be frequently found. Yet, for the purpose at hand the latter is not particularly helpful – a company may well be an SME but at the same time the world leader in a specific market segment. Pretty much the same holds for the former – SAP, for example, is clearly a vendor of ICT systems, but at the same time also a large user. On the other hand, a company like Mercedes would typically be classified as a user. However, this is increasingly questionable given the large number of networked ICT components installed today at least in high-end cars.

Updegrave [2006] proposed a more useful and applicable classification. He distinguishes three categories – 'Spectator', 'Follower' and 'Leader', respectively. Jakobs et al. [2010a] added a fourth category, 'Contributor', placed between the latter two. The motivations to actively participate in standards setting and the envisaged outcomes vary between members of each category. They may be summarised as follows:

- **Leader**
For companies in this category participation in a certain standards-setting activity is business critical. Accordingly, they are prepared to make a large investment in such an activity. Leaders aim to control the strategy of an SSO, a Technical Committee or a Study Group rather than merely participate in its technical activities. Leading global ICT manufacturers and service providers are typical representatives of this category.

- Contributor
A Contributor company is an active participant in the standardisation process and contributes to the development of the content of the standard. Yet, it is less interested in (or lacks the resources for) influencing the strategic direction of an SSO. Innovating smaller manufacturers may be found here.
- Follower
Organisations in this category want to enjoy full membership privileges and may occasionally want to influence the technical content of a standard (in addition to gathering intelligence). They are, however, not very much interested to influence any strategic decisions. Firms that would need to implement the standard and not overly innovative manufacturers are typical members of this category.
- Spectator
A Spectator's main motivation for participation is intelligence gathering. Spectators do not actively contribute to the creation of the standard. Rather, they want to be informed about the technical nuts and bolts of a future standard. Typically, this group primarily comprises academics, consultants, and to some extent developers and system integrators. Spectators do not normally need – or get – voting rights.

Linking the Classifications

A link between the two classification introduced above may easily be established. Standards are well understood (by some) as a tool to either open up new markets or extend existing ones. Innovative 'Prospector' companies will typically be among those that have understood the economic role a standard may play and its importance. Accordingly, they will deploy standardisation to make sure that those standards will be developed that are necessary to create/extend a market that is of (strategic) interest for them. To this end, it will, in most cases, be more important for them to influence the overall strategic direction of an SSO than to specify the technical nuts and bolts of these standards³.

An alternative approach here might be to try and dominate a market through a new innovative technology and making it a de-facto standard [Kang & Jun, 2012]. However, especially in markets with strong direct network externalities (like telecommunication, as opposed to e.g. IT) this approach is hardly a realistic option, even for the most powerful players.

In any case, the type of a company (Prospector, Analyser, Defender, Reactor) may well change over time and/or differ between markets. The latter is perhaps best exemplified by the 'Analyser'. Such companies aim at both the development of new, and the offering of a set of stable, products and/or services. To do so successfully over time, they may need to adopt either a 'Leader' or a 'Contributor' approach, depending on the respective sector. Kang & Jun [2012] give the example of Samsung. This company had adopted a 'Defender' position in the VCR market, where its position was sustained by manufacturing capability. In the smartphone market of today, Samsung rather more assumes a 'Prospector' role.

Together with the above the two classifications introduced in sections 4.1.1 and 4.1.2 provide for a fairly straightforward mapping, as shown in Table 1.

	Leader	Contributor	Follower	Spectator
Prospector	++	+	-	--
Analyser	+	++	-	--
Defender	--	+	++	-
Reactor	?	?	?	?

++ = most likely; + = may well be; - = rather unlikely; -- = most unlikely; ? = unclear

Table 1: Linking Organisational Strategies and Approaches to Standardisation

The above mapping refers first and foremost to those technologies that are of vital interest to a firm. That is, different behaviours may well occur in cases where, for instance, the technology to be standardised is of undetermined interest or where participation is mostly prophylactic – they might at some point in time do some relevant work, so we'd better watch (according to Updegrave [2003], back then both Sun and HP reported to be members of around 150 SSOs each). This implies that a Prospector may also well be a 'Spectator' in certain cases (see above).

To further elaborate on the above, an interesting link relates to the three 'problems' defined by Miles & Snow [1978] and the respective relevance of standardisation for them.

- Entrepreneurial

³ This may be easier to achieve in a private standards consortia than in formal SDOs, which may well be another reason for the popularity of standards consortia in some circles.

Standardisation-related issues will be most prominent here. A firm wishing to introduce a new product or service in a certain market, to extend an existing market or to create a new one will in most cases rely on standards in one way or other. If adequate standards are already in place they may be used as platform for an innovation (product or service). Otherwise, new ones will have to be developed. In this case, the focus may either be on developing a standard – i.e. its concrete technical specifications will be less important than the fact that a standard (any standard) will exist in the first place. Alternatively, if a concrete new product or service has already been specified the focus will shift towards influencing the technical content of a new standard. Of course, both alternatives may also occur in parallel. The typical roles assumed here will be those of a ‘Leader’ (in the former case) or of a ‘Contributor’ (in the latter one).

- **Engineering**
This refers largely to internal (ICT) systems. In this problem area firms will typically assume the role of a ‘Follower’. They will rarely develop requirements that are important and specific enough to be worth fighting for their incorporation into a new standard.
- **Administrative**
While ICT standards will hardly play a role here⁴, this problem does have clear links to standardisation. For one, it will need to address questions like where a standards department should be placed in the organisational structure or if there should be a dedicated such department in the first place. Moreover, given the potentially crucial importance of standards for a firm, adequate communication channels need to be established to inform standards setters about relevant strategic issues associated e.g. with a new standard they are contributing to.

2. Standards setting organisations

Standards are developed by different SSOs. The individual organisations may co-operate or they may compete, and so may, eventually, their output in the market. This has resulted in an almost inscrutable (for most) web of SSOs, with complex associations between individual organisations. Yet, intimate knowledge of this web and its individual constituents is an important basis for sensible standardisation management (“Which SSB is best for the task at hand?”). Part of this web is depicted in Fig. 3

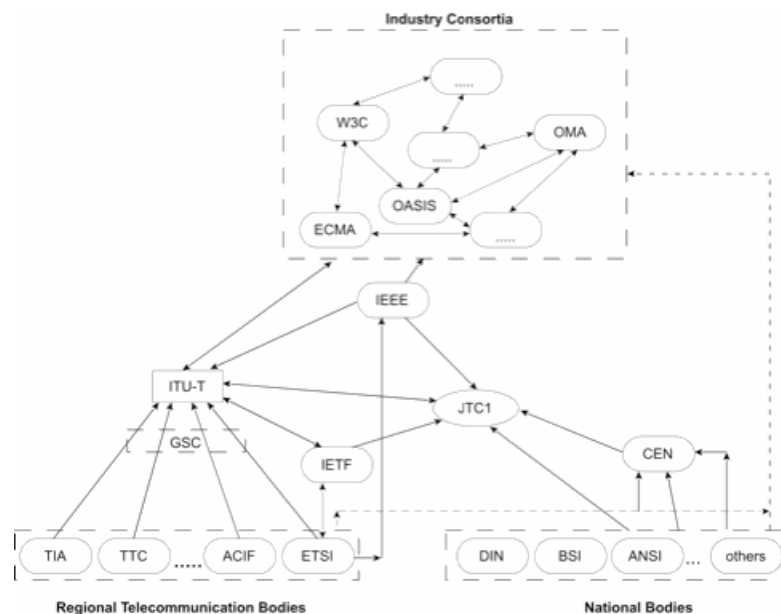


Figure 2: The ICT standardisation universe today (excerpt; adapted from [Jakobs, 2009])

An interesting aspect is associated with the co-operation between SSOs. In some cases, such co-operations may offer a welcome ‘detour’ for stakeholders who actively want to push a specification towards a standard. Probably the best known example here is the case of Microsoft’s OOXML. After ISO had voted against it, Microsoft went ECMA-international instead. ECMA is an ISO Class-A-Liaison, which means that ECMA standards enter the ISO process at a late stage. With this move, and some accompanying measures, OOXML was eventually made an ISO standard (see e.g. [Kosek, 2008]).

⁴ The situation may well be different for e.g. process oriented standards like the ISO 9000 (Quality management), ISO 14000 (Environmental management), ISO 26000 (Social responsibility) or ISO 31000 (Risk management) series of standards.

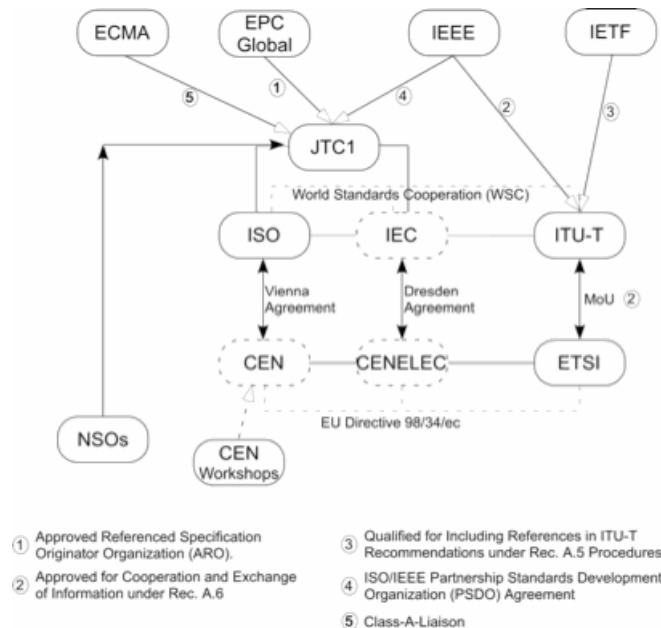


Figure 3: Sample types of links between SSOs (adapted from [Jakobs et al., 2010b])

A popular distinction is between formal SDOs and consortia (as also reflected in Fig. 1). However, this classification is not necessarily helpful. For one, the processes of most large and well-established consortia (like the W3C and OASIS) have become very similar to those of the SDOs. Accordingly, the European Commission has recently done away with this distinction in their ICT policy [EC, 2011]. That is, in order to get a clearer picture about the characteristics of the different SSOs a more flexible approach is required. Updegrove [2006] devised one such approach that is based on attributes that can be used to describe an SSO. An organisation wishing to become active in ICT standardisation can then match its requirements on such a description and identify the SSO(s) that best meet its specific needs⁵. These attributes can be sub-divided into four categories:

- General
- Membership
- Standards setting process
- Output

The most important attributes of each of these categories will be briefly discussed below.

'General' Attributes

These attributes serve to provide some high-level information about an SSO. Information on its internal structure and on the way it is governed; e.g. which body makes the ultimate decisions will be especially important for those who would like to influence the strategy of an SSO. An SSO's structure and governance have ramifications for the openness of an SSO⁶. The same holds for its liaisons with peer organisations, which also are means of co-ordination. A good level of co-ordination reduces the risk of standardising on a technology that may eventually become incompatible with other relevant standards. Conversely, the level of competition an SSO (or rather, a standard to be developed) faces in an indicator of the risk to be associated with contributing to said standard – a 'monopoly' situation suggests a reasonably safe bet.

Finally, the IPR policy has a significant impact on an SSO's attractiveness, most notably for holders of potentially relevant IPR⁷. According to Updegrove [2003], for instance, two large IT vendors in a study check a consortium's IPR policy "very carefully" and "in excruciating detail", respectively, before deciding whether or not to join.

'Membership' Attributes

The overall number of members may be used as a rough indicator of the success of an SSO's output. A broad membership base may well imply valuable support for a standard. However, the prominence of members (in

⁵ Obviously, an SSO's right field of expertise is a sine-qua-non (and will, therefore, not be discussed here).

⁶ In particular, this holds for a private standards consortia. Most international and regional SDOs have national membership (ETSI and partly ITU being the exceptions here).

⁷ The two most popular options include Fair, Reasonable and Non-Discriminatory (FRAND) and Royalty Free (RF). See e.g. [Simcoe, 2008] or [Lea & Hall, 2004] for in-depth discussions.

terms of e.g. market share) is rather more important. Support by large and important companies will significantly improve a standard's chance to be successful in the market. More important still is the list of those major companies and institutions that actively contribute to the standardisation work in an SSO. Such active participation is a very good indicator of the support an SSO's standard may eventually enjoy in the market.

'Standards Setting Process' Attributes

An SSO's standards setting process is decisive for its ability to quickly adapt to a changing environment and to newly emerging requirements, to meet a window of opportunity, or to support real-world implementations.

In many ways, 'time' is an important dimension. Relevant aspects here include primarily 'short time to market' and the ability to spot a window of opportunity and to deliver inside this window. That is, the time it takes to develop standard is an important factor. Obviously, this depends very much on, for example, the level of consensus sought, the degree of openness of a standards setting process, its transparency and the observation of due process. In many cases, it will be necessary to balance the requirement for speed and the need for a broad consensus (which, in turn, has an impact on the 'legitimacy' of a standard).

Other potentially important aspects here include the requirement for interoperable implementations of a standard and proof of an implementation's conformance with the standard.

'Output' Attributes

The deliverables an SSO produces give an indication about its flexibility. For instance, full-blown formal standards indicate a more lengthy process, technical reports or similar types of deliverables suggest a faster, more adaptable process with a lower level of consensus. Information about the number of implementations shows the relative 'importance' of an SSO and may serve as one indicator of its 'credibility'. A standard that is maintained over time also says something about the SSO's willingness to adapt its deliverables to changing environments (as opposed to a 'fire and forget' approach). A well-managed maintenance process is extremely helpful for longevity and adaptability of a standard. This also includes a mechanism to ensure consistency of an SSO's standards.

Different Stakeholders' Perspectives

Different stakeholders will assign different levels of importance to the attributes outlined above. For example, a typical motivation for a large user company⁸ to participate in standards setting is to avoid eventually being stranded with a standard that doesn't succeed in the market. From its perspective (and apart from being technically adequate) the standard needs to be based on a broad consensus of all relevant stakeholders. It should adequately reflect user requirements and enjoy the support of many/all relevant major vendors and/or service providers. Ideally, no royalties should be attached but if licensing fees are to be paid they should be reasonable and not discriminate against individual stakeholders.

On the other end of the spectrum holders of a strong relevant patent portfolio (including potentially essential patents⁹) may well aim to make as much money as possible out of their Intellectual Property. To that end, they will primarily aim to assume a leadership position, either in the SSO or in the group that oversees the development of the standard in question. In addition, they will also send staff to the working group that does the actual technical specification work. Accordingly, they will look for a less democratic, hierarchical structure and processes that allow them to exert the desired influence.

The above, though over-simplifying, highlights why different stakeholders will look for different characteristics in an SSO, depending on their respective strategy (which may, of course, vary between standards).

3. Individual standards setters

The discussion above shows that different stakeholder will aim at exerting varying degrees of influence over an SSO's process, depending on their respective levels of interest in a standard to be developed. Thus far, the focus has been on more strategic issues – e.g. how to select the best-suited SSO, how to arrive at standards that are in line with business interests.

However, at the end of the day, a standard's specification results from the efforts of the members of an SSO's working group. Consequently, these individuals' motivations, attitudes and views are very likely to have an influence on the outcome of the standards setting process. A quote from a survey reported in [Jakobs et al., 2001] may serve to highlight this:

“Oddly enough, it's been my experience that individuals dominate ISO. Sometimes the individual will have a powerful multinational corporation or government/national interest on

⁸ Think of it here as e.g. a large petro-chemical company.

⁹ An essential patent describes an invention that must be implemented to comply with a standard.

their side, but the bully pulpit is controlled by individuals, and only those with a strong sense of purpose survive.”

Even if one assumes that this is not necessarily always the case, the influence a strong-minded individual standards setter may have on the final outcome of the process should not be underestimated. Umapathy et al. [2007] put it quite nicely: “*The human dimension of standards setting is an important component of the consensus-based process employed by standards consortia*”. It should be added that the same holds for formal SDOs.

At least in the field of ICT (and specifically in mobile communication) the WGs are almost exclusively populated by engineers with a strong technical background (as opposed to e.g. strategy or marketing; see e.g. [Rosenkopf et al., 2001], [Jakobs et al., 2010a] or, albeit for a more historical account, [Henrich-Franke, 2008]). One should, therefore, assume that technical soundness, representing good engineering practice and going beyond the state-of-the-art, are the most important individual success factors for a proposal to become the new standard. Yet, there is evidence that speaking out at meetings for or against a proposal is the most important single factor that influences technical decisions [Jakobs et al., 2001], [Jakobs et al., 2010a]. That is, even good proposals will hardly be considered if nobody is available to explain and defend them at meetings.

However, continuous active participation in standards setting in order to support proposals is a necessary condition, but not a sufficient one. Rather, a sustained participation by the same capable – and thus respected – representatives is the most promising approach. Over time, such individuals will have established extensive personal networks with their peers from both their own and other firms [Grundström & Wilkinson, 2004]; they will have amassed a wealth of social capital [Dokko & Rosenkopf, 2010]. Such networks or social capital will make it much easier to solve any identified problems either up-front or to find solutions to newly emerged problems in a rather more informal way (see also [Henrich-Franke, 2008] for a nice historical example).

The individual members of standards working groups act according to the role each of them assumes. These roles may be categorised along two dimensions. The first such dimension might be referred to as ‘Task’. This refers to the actual type of activity in the WG an individual carries out. Such a Task may, for example, be to contribute fine-grained technical details (‘Architect’), just observe (‘Bystander’), guide the whole process (‘Facilitator’) or indeed try and thwart it (‘Obstructionist’; see e.g. [Umapathy et al, 2007] and [Spring et al., 1995]). The second dimension could be called ‘Representation’. According to [Jakobs et al., 2001], WG members may see themselves as e.g. ‘Company Representative’, ‘User Advocate’ or ‘Techie’ (i.e. focus on technically clean and advanced solutions). These dimensions are not totally orthogonal to each other (for example, a ‘Techie’ somewhat resembles an ‘Architect’) but in general each instance of ‘Representation’ may be associated with the best suited ‘Task’ (which may change over time).

In addition to the informal roles described above more formal roles also need to be filled in a standards WG. Depending on the SSO, such roles may include, for example, ‘Editor’ or ‘WG Chair’. These roles typically require a not inconsiderable amount of additional work to be done. The influence of those who are prepared to put in this extra work should not be under-estimated (see also e.g. [Spring et al., 1995]). Yet, a similar level of influence may be acquired through e.g. a combination of a strong personality and in-depth technical expertise. In fact, these two aspects are probably intertwined – those with strong views are more likely to be inclined to invest time and effort to actually get their ideas incorporated into the standard.

D. Putting it All Together

This paper has identified and discussed a number of factors that may have an impact on a firm’s success in ICT standardisation. Some of these factors link directly to a firm’s business strategy, as exemplified by the rather close correlation between types of organisational strategies and approaches to standardisation, as identified by Miles and Snow and Updegrave, respectively. Other aspects, like the importance of the skills and expertise of the individuals that do the actual standardisation work in the technical working groups of the SSOs, have also been highlighted. An adequate consideration of these factors, and appropriate implementation through a dedicated corporate standardisation management, should help standardisation managers to perform their tasks more efficiently and effectively.

Thus far, the paper looked at the actors ‘SSOs’, ‘Companies’ and ‘Individuals’ separately. Obviously, though, they are closely intertwined. Moreover, other influencing factors, not discussed in this paper, may be identified¹⁰. Plus, of course, a standard is not an end in itself. Rather, it needs to be diffused and, ultimately, adopted in order to be of any relevance for the market and, not least, its developers. Figure 3 puts it all in pictorial form.

The links between the individual entities are really quite obvious. Corporate strategies and technical preferences, for example, should to a considerable degree shape the goals of the work of the firms’ standards setters – provided that they are aware of them. Adequate internal structures, processes and information flows need to be in place to help actually provide the individual WG members with such relevant background

¹⁰ See e.g. [Brons, 2007] for a discussion of factors that may impact effective participation in standardisation.

knowledge. Moreover, firms might want to make sure that their representatives in an SSO actually promote their employer's interests (if applicable).

Both the technical and the non-technical (rhetoric, diplomatic etc.) capabilities and experiences of the individual representatives will have a considerable impact on the final standard. Which of these are more influential may vary between committees (ideally, WG members possess both, but such people are hard to come by). In any case, presence at meetings to defend one's own proposal or kill a competing one is a sine-qua-non.

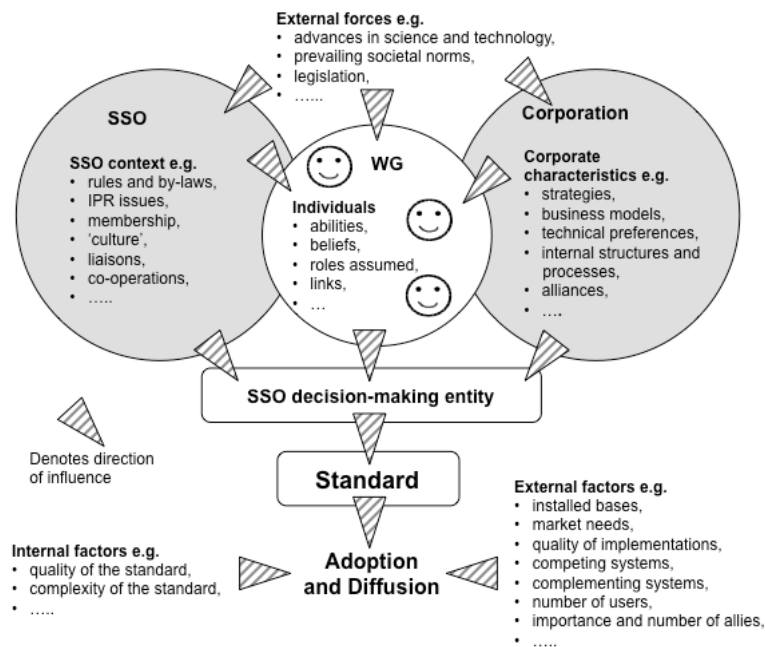


Figure 3: Some Factors That Influence Standards Development

'Success' is a tricky term in standardisation, with several dimensions. From a participating stakeholder's perspective, one dimension depends on its initial goals. For a Spectator, for instance, 'success' will simply mean improved intelligence. A Contributor may measure success in terms of the number and importance of his technical proposals that have been incorporated into a standard; this may give him a competitive edge in the development of the specified product or service. Moreover, the standard may be a potential source of royalties if the proposals were based on patented technology.

However, this is only part of the picture. The standard also needs to be actually implemented and incorporated into products or services. That is, adoption by the market is the ultimate success factor for those who contributed to its development. For Followers and Contributors, i.e. those who would typically contribute the most to the technical work, both dimensions are important. For Leaders, the fact that a standard has come into existence may be the most important aspect; they do not necessarily care about its technical nuts and bolts (but may well do: see also e.g. [Updegrave, 2003]).

In any case, stakeholders that want to excel in ICT standards setting need to be aware that all aspects discussed above need to be taken into account; their respective relevance will vary between categories. Followers and Contributors need to make sure that they have good technical proposals to be defended by equally good representatives. Leaders, on the other hand, will need to focus more on strategic aspects. In any case, representatives at all levels need to be well informed about their employer's strategic and tactical goals in the field. Obviously, this implies that the employer is very clear about his goals.

A number of potentially important aspects are not depicted in Figure 3. For one, a firm may very well have considerable influence on e.g. the structure and the by-laws of an SSO. This will be most visible in those cases where the firm is a founding member of a new SSO. Likewise, in the figure the direction of influence is from the firm and the SSO, respectively, on the working group. It might well be conceivable that it also works in the opposite direction – that individual WG members have an influence on, for instance, their employer's strategic direction as a result of their standardisation work. And finally, a quantification of the individual influential factors would be of considerable interest albeit probably next to impossible to achieve up-front.

E. References

- APEC Secretariat (2010): Choi, D.G.; Kang, B.G.; Kim, T.H. (eds.) Standardization: Fundamentals, Impact, and Business Strategy. Available through http://publications.apec.org/publication-detail.php?pub_id=1032 (accessed 8 May 2013).
- Betancourt, D.; Walsh, R. (1995): The Evolution of Strategic Standardization Management. *StandardView*, vol. 3, no. 3.
- Brons, T.F. (2007): Effective participation in formal standardization: A multinational perspective. Rotterdam, The Netherlands: Rotterdam School of Management.
- den Uijl, S.; de Vries, H.J.; Bayramoglu, D. (2013): The Rise of MP3 as the Market Standard: How Compressed Audio Files Became the Dominant Music Format. *Int. J. of IT Standards and Standardization Research*, vol. 12, no. 1.
- Dokko, G.; Rosenkopf, L. (2010): Social Capital for Hire? Mobility of Technical Professionals and Firm Influence in Wireless Standards Committees. *Organization Science*, vol. 21, no. 3.
- EC (2011): A strategic vision for European standards: Moving forward to enhance and accelerate the sustainable growth of the European economy by 2020. COM(2011) 311 final. <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2011:0311:FIN:EN:PDF> (accessed 8 May 2013).
- Egyedi, T.M. (2010): On the Implications of Competing Standards. In: Fredenberg, A.; Nyberg, S. (eds.): *The Pros and Cons of Standard Setting*. http://www.kkv.se/upload/Filer/Trycksaker/Rapporter/Pros%26Cons/rap_pros_and_cons_standard_setting.pdf#page=12 (accessed 8 May 2013).
- Egyedi, T. M.; Koppenhol, A. (2010): The Standards War Between ODF and OOXML: Does Competition Between Overlapping ISO Standards Lead to Innovation?. *Int. J. of IT Standards and Standardization Research*, vol. 8, no. 1.
- Grundström, C.; Wilkinson, I.F. (2004): The role of personal networks in the development of industry standards: a case study of 3G mobile telephony. *The Journal of Business & Industrial Marketing*, vol. 19, no. 4/5.
- Henrich-Franke, C. (2008): 'Cookies for ITU': The role of social networks in standardization processes. In: Schueler, J.; Fickers, A.; Hommels, A. (eds.): *Bargaining Norms – Arguing Standards*. STT, The Hague.
- Jakobs, K.; Procter, R.; Williams, R. (2001): The Making of Standards. *IEEE Communications Magazine*, vol. 39, no. 4.
- Jakobs, K. (2009): Real Standards for Virtual Worlds – Why and How? *Journal of Virtual Worlds Research*, vol. 2, no. 3.
- Jakobs, K.; Lemstra, W.; Hayes, V.; Tuch, B.; Links, C. (2010a): Creating a Wireless LAN Standard: IEEE 802.11. In: Lemstra, W.; Groenewegen, J.; Hayes, V. (eds): *The Innovation Journey of WiFi*. Cambridge University Press.
- Jakobs, K.; Wagner, T.; Reimers, K. (2010b): Standardising the IoT – Collaboration or Competition?. In: Proc. e-Democracy, Equity and Social Justice – EDEM2010, IADIS.
- Kang, B.G.; Jun, B.H. (2012): Understanding Standardization Strategy based on Miles and Snow Strategic Framework. In: Zelm, M.; Sanchis, R.; Poler, R.; Doumeingts, G. (eds.): *Enterprise Interoperability: I-ESA'12 Proceedings*. John Wiley & Sons.
- Kosek, J. (2008): From the Office Document Format Battlefield. *IT Professional*, vol. 10, no. 3, 51-55.
- Lea, G.; Hall, P. (2004): Standards and intellectual property rights: an economic and legal perspective. *Information Economics and Policy*, vol. 16, no.1.
- Miles, R.E.; Snow, C.C. (1978): *Organizational strategy, structure, and process*. McGraw-Hill.
- Rondinelli, D.; Vastag, G. (2000): Panacea, Common Sense, or Just a Label? The Value of ISO 14001 Environmental Management Systems. *European Management Journal*, vol. 18, no. 5.
- Rosenkopf, L.; Metiu, A.; George, V.P. (2001): From the Bottom Up? Technical Committee Activity and Alliance Formation. *Administrative Science Quarterly*, vol. 46, pp. 748-772
- Simcoe, T. (2008): Open Standards and Intellectual Property Rights. In: Chesbrough, H.; Vanhaverbeke, W.; West, J. (eds.): *Open Innovation: Researching a New Paradigm*. Oxford University Press.
- Michael B. Spring, M.B.; Grisham, C.; O'Donnell, J.; Skogseid, I.; Snow, A.; Tarr, G.; Wang, P. (1995): Improving the Standardization Process "From Courtship Dance to Lawyering: Working with Bulldogs and Turtles". In: Kahin, B.; Abbate, J. (eds.): *Standards Policy for Information Infrastructure*. MIT Press.
- Umamathy, K.; Paul, S.; Purao, S.; Bagby, J. W.; Mitra, P. (2007). Avatars of Participants in Anticipatory Standardization Processes. *The Standards Edge*. Bolin Group.
- Updegrave A. (2003): Survey: Major standards players tell how they evaluate standard setting organizations. *Consortium Standards Bulletin*, vol. 2, no. 6. <http://www.consortiuminfo.org/bulletins/jun03.php> (accessed 8 May 2013).
- Updegrave, A. (2006): Participating In Standard Setting Organizations: Value Propositions, Roles And Strategies. *The Essential Guide to Standards*, Chapter 2. <http://www.consortiuminfo.org/essentialguide/participating1.php> (accessed 8 May 2013).