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Lack of openness as a potential failure in standardisation management – lessons learnt from setbacks in European learning technology standardisation

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Abstract. Formal standards organisations (e.g. CEN and ISO) struggle to adapt to the work processes of the 21st century, especially within ICT standardisation where open innovation principles are promoted. European pre-standardisation activities in the field of learning technologies are now (beginning of 2014) put on hold due to resistance from CEN to allow for open processes and open distribution of documents free-of-charge. This paper analyse this case on the background of a holistic standards process and potential failure model. Openness is presented as a key factor in enabling pre-conceptualisation, scoping, negotiating, drafting, implementing and maintaining ICT standards. Insisting on a business model of selling standards documents could potentially hamper participation from research and restrict implementations and user engagement in a way that for this domain puts the whole standardisation system at risk.

Keywords: Standardisation Management, ICT standardisation, Open innovation, European Standardisation Organisation CEN, standardisation failure, open document policies

Introduction

«The policy officer [responsible for the implementation of the European Union Opening Up Education Action plan] made it clear that by open standards was meant free-of-charge specifications (which is clearly clashing with CEN's business model)…» [1]. This quote from a case document of CEN Technical Board shows that the main European standards organisation is finding itself at odds with a major European (and international) innovation policy trend, founded on openness [2,3,4]. It is not surprising that standardisation organisations, like other content industries, struggle to adjust to new publishing models. What is surprising, – in this case – is CEN's answer to the challenges: Instead of entering into a dialogue to learn about the new landscape with the rather limited community of learning technology stakeholders, the organisation just shuts down the main European focused learning technology standardisation operation and cancels projects.

CEN has had good time to prepare for this situation. Even if royalty-free standards are a recent phenomenon, dating from the late 1990s and early 2000s [5], CEN management could not have avoided reading the text on the wall coming out of a number of European projects looking into ways to improve the standardisation system [6,7], and the new EU policies of openness being inscribed in the Horizon 2020 program [8]. More importantly, CEN would know that they – especially within ICT standardisation – have fierce competition from a host of industry consortia. The time frame of royalty-free standards coincides with the growth of the World Wide Web, the use of open source, and the democratisation of standards and participation in standardisation [5]. Free-of-charge standards for use by anyone for any purpose are not primarily a question of the cost of buying the standards documents. It is not about pecuniary expenses, but loss of opportunities and creativity. For some developer and implementer communities, «open and free» have become markers for a number of factors that at the end define the qualities of the normative consensus process they are looking for. If *not* open and free, – people, ideas, processes, timing, market positioning – all the pieces that make up the complex ecosystem of ICT standardisation may not be there. And, as there are alternative standard setting organisations out there, why go with the ones that are stuck with yesterday's models of standard setting as a business of selling physical documents?

This paper is sparked by the current challenges in European learning technology standardisation. However, the CEN WS/LT case will be used to explore what could fail in standardisation of a domain that is so disruptive as learning technologies. By identifying what often goes wrong, the aim is to map the crucial enablers that could make standardisation in this field less prone for failures. The paper is experiential, with support of a case study, it relies on the author's observations over the last more than ten years in standardisation fora, most of this period in leadership positions as workshop chair or national delegate.

The research question of this paper is to identify the failure prone processes of learning technology standardisation, and to analyse what role openness could play to put theses processes right.

Related work

Standardisation is a poorly understood discipline in practice, claims Carl F. Cargill [5]. As a standardisation practitioner he sees himself working in an area of imperfect knowledge. Standardisation as a technical or economic phenomenon is analysed and praised for its contribution to innovation [3,9,10]. However, there are not many studies on why practical standardisation efforts fail, and what lessons could be learnt. This author has been concerned about quality issues of learning technology standardisation and has warned that this could impact the necessary legitimacy of the activity leading to lack of support to standardisation [11], ill scoped projects [12], or meta design choices that produce standards that are too complex or too difficult to implement [13]. As an ecosystem, standardisation can – if carefully balanced – foster innovation and serve as an incubator for emerging technologies [14]. «As with all ecosystems, some conflict is necessary in order to

sustain life and even to evolve» [14]. The current schism between European formal standardisation and the educational community has the potential to lead to a better understanding of what a balanced system is in the context of ICT standardisation. A better understanding must address the whole system, not only the rather isolated standards setting activities. Egyedi [15] has presented a simple model of the factors influencing the standards development and the factors influencing implementation of a standard. These are two different, but interacting settings, which engage a multitude of stakeholders and actors that should, but seldom are, well coordinated and integrated.

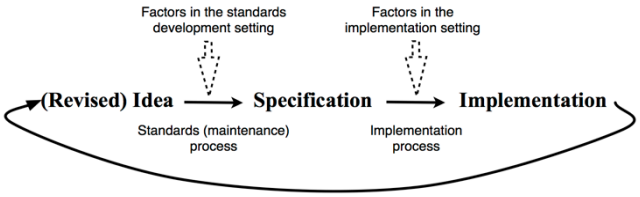

Figure 1 Simple model of standardisation phases, from Egyedi (2008)

The model resonates with the five stage model Cargill put together nearly 20 years ago [16] identifying the following stages: Pre-conceptualisation, Conceptualisation, Discussion, Writing, and Implementation. In a 2011 paper Cargill used this model to identify major categories of failure in standardisation. Based on the models of Egyedi [15] and Cargill [16], and previous studies by the author [11,12,13] the following matrix of potential failure points can be constructed.

Table 1 Stages of standardisation and possibilities for failures

Stage	Failure modes
Pre-conceptualisation [16] Idea phase: Input from Research & Practice [15]	The standard fails to get started [16] R & D community lacks motivation to interface with standardisation Requirement solicitation too weak to provide input from the market No prototype implementations available to demonstrate proposed concepts SSO without appeal to standardisation experts
Conceptualisation [16] Scoping of New Work Item	The standard fails to get started; the standards group fails to achieve consensus, and deadlocks. [16] Inadequate scope (e.g. too wide) too weak guidance for drafting Non-representative expert group

	Work based on misfitting meta design strategies
Discussion [16] Specification [15]	The standard suffers from "feature creep", and misses the market opportunity. [16] Time consuming specification process Diverting interests in the standards group prolongs drafting
Writing [16] Specification [15]	The standard suffers from "feature creep", and misses the market opportunity. [16] The standard grows too complex and difficult to implement
Implementation [15,16]	The standard is finished and the market ignores it. [16] The standard is finished and implementations are incompatible. [16] Too few implementations to feed maintenance and feedback loop The standard is accepted and is used to manage the market. [16]
Input / Feedback / Maintenance [15]	Users are not heard – requirements are not solicited SMEs do not relate to standards community – see no incentives to contribute to development or maintenance

The Cargill and Egyedi models described above address standardisation in general. When target domain is added to the analysis it becomes clear that timing is an essential determining success (and failure) factor. In an emergent and disruptive domain as learning technologies [17] standardisation has to be anticipatory [18]. Figure 2 shows the technology S-curve depicting the trajectory of technology, from idea to mature technology, and transition to a new technology. Anticipatory standardisation works hand in hand with product design; while participatory standardisation is initiated only at the stage when knowledge of the technology is shared and products start being brought to the market. Responsive standards codify knowledge already established in practice.

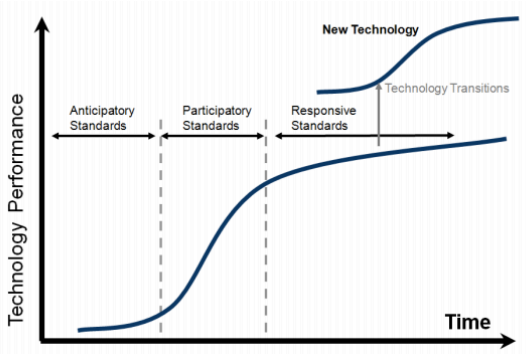

Figure 2: Timing of standards in relation with the technology S-curve (source: Sherif, A Framework for Standardisation in Telecommunications and Information Technology, IEEE Com. Mag. 2001)

One challenge of anticipatory standardisation is stakeholder engagement. To boost European industry, the European Commission has proposed to use standards as a way to leverage R&D results, which "inherently means 'early standardisation': standardisation takes place at a very early stage of technology development" [9]. However, it is not self-evident that the R&D community wants to work with the particular standards community or standard setting organisation.

The iterative and circular characteristic of the standardisation process is highlighted in the Egyedi model (Figure 1). Seen as an ecosystem, a standard project is not singular and isolated. Egyedi and Blind [19] speak of 'standards dynamics', referring to 'the changes to and interactions between standards, that is, what happens to standards once they have been set'. Van den Ende et al. use the term 'standard flexibility' for changes in a standard's contents over time applying an adaptation perspective, emphasising the abilities of standard-supporting networks to change the standard as well as the network over time [20]. These authors include in their analysis the processes that create path dependencies in the evolution of a standard, i.e., the processes that gradually narrow down the range of options, going through a pre-formation phase (pre-conceptualisation), a formation phase (conceptualisation/specification) and a lock-in phase.

The rest of this paper will look more closely to the failure of European learning technology standardisation using a single case study approach [21]. The aim is to identify critical failure points that could inform a more sustainable model.

The case of CEN WS/LT

The CEN Workshop for Learning Technologies was officially launched in February 1999 [22]. As a Workshop under the CEN umbrella, WS/LT has

published CEN Workshop Agreements, a kind of lightweight standards that reflect the consensus of the experts sitting around the table. The Workshop is open to all, without any prior endorsement from CEN Member Bodies. The outputs could be subject to formal standardisation through CEN technical committees. In 2007 CEN established a technical committee (TC 353), which has been working in close cooperation with the workshop, publishing some of its CWAs as European Norms.

The work in the Workshop work has fallen into two categories, projects funded by the European Commission, and unfunded projects. For funded work, the EC has mandated open publication free-of-charge of the resulting CWAs. However, for the last 5 - 8 years the EC funding has not kept up with the need for standards; and therefore, for some projects the Workshop members have been willing to engage in unfunded work in order to satisfy market needs. The CWA 15903 Metadata for Learning opportunities (MLO)[1] is one example of such unfunded work.

In 2013, after the finalisation of one of the most successful projects in the history of the Workshop, in terms of stakeholder engagement in development, (InLOC[2]), the CEN/CENELEC Management Centre (CCMC) put on the brakes. The CEN Standards Director and Program Manager were alarmed by the openness of the work procedures, e.g., by using a wiki for collaborative writing, commenting, and consultation outside the password protected wall of the standards setting body. The CCMC insisted on a work process restricted to the use of an e-mail reflector with a limited list of participants, and document exchange via their Livelink repository system.

> *«In the recent years, the Workshop has elaborated and published some unfunded project outcomes and has been under the false impression that the CWA are free-of-charge documents. CCMC recently discovered this inconsistency with the CEN rules and tried to redress the situation on several occasions by explaining the provisions of CEN-CENELEC Guide 10 'Guidelines for the distribution and sales of CEN-CENELEC publications' and CEN- CENELEC IR Part 2. The Chairs' position was strongly in favour of keeping the current status quo based on their personal interpretation of the CEN rules.» [1]*

'Redressing' is the word CCMC uses for their termination of the activities of the CEN WS/LT. December 12th 2013 the Technical Board of CEN, the governing body of the organisation with delegates from each CEN national member, met in Brussels to discuss the fate of the Workshop. A month later, conclusions of the discussion are not conveyed to the Workshop chairs. However, there is reason to believe[3] that the majority of the Technical Board is not in favour of continuing the Workshop.

Minutes from the Workshop meetings and e-mail exchange between CCMC and the Workshop chairs show that it is the «sustainability of the standardisation system» that is as stake. «CEN assumes the protection and legal responsibility for the copyright of its publications. CEN and its members are the only entities entitled to benefit from the exploitation rights on CWAs» [23].

In 2013 CEN also introduced a new policy that will impact on the ability of CEN workshops and committees to solicit input from external organisations, e.g.,

EU projects. CEN-CENELEC Guide 25 on «Partnership with European Organisations and other stakeholders» regulates that each organisation has to pay 500€ as an annual fee to participate.

While CCMC and the Workshop chairs were mapping the boundaries towards openness in formal standardisation the European Commission launched their new initiative Opening Up Education. On 25 September 2013 EC published a communication stating that all educational materials supported by EU projects should be available to the public under open licenses (EC 2013). EC states that open interoperability standards are necessary to ensure economics of scale, and «such standards must remain open». Therefore, the Commission will «promote the development of open frameworks and standards for interoperability and portability of digital educational content, application and services, including OER, in cooperation with European standardization organisations and programmes» [8]. When CCMC learnt about this key action in the Opening Up Education initiative, they requested a meeting with the responsible EC Directorate General (DC EAC). Obviously the CCMC met no understanding for their view in the EC [1].

> *«The technical work of the CEN WS LT has now been put on hold and the Workshop assumed the role of a discussion forum communicating Workshop expert positions and other activities not necessarily within the scope of the CEN WS LT.*
>
> *It is to be noted that CEN/TC 353 'ICT for education, learning and training' was created by CEN (see Resolution BT 2/2007) with a very similar scope of activities, namely the development of standards for vocabularies and frameworks, quality and competencies in the education and learning environment. In recent years, there was no clear delimitation of the responsibilities of the CEN WS LT and CEN/ TC 353 in this field.» [1]*

Elaborating on the consequences of the discontinuation of the WS/LT, the CCMC points to the TC 353. The argument seems to be that standardisation in the learning technology domain will be easily carried on by this technical committee. In assessing how realistic this is, the following observations from six years of TC work[4] should be noted:

The TC has not *drafted* a single standard, which is not based on work in the Workshop. (Some international ISO standards have been rubber stamped as European norms, not involving any technical work).

- The time frame for pre-conceptualisation and conceptualisation work in the TC is very limited if the deadlines in the CEN directives should be followed. The implication is that the TC is in need of a base document either coming from another standards organisation, from a National Body, or from a CEN workshop. The modus operandi till now has been pre-standardisation work in CEN WS/LT, as in the case of EN 15981:2011 Metadata for Learning Opportunities (MLO) Advertising, which was built on CWA 15903.

- Technical work needs technical experts. A large proportion of the National Body appointed delegates to TC 353 till now is standards bureaucrats whose professional prerogative is management of the standardisation process. In order for a technical expert to take part in TC standardisation, the expert needs to be recruited and appointed by a National Body, which brings a new group of actors to the standardisation scene for this particular domain.

Discussion

The breakdown of European pre-standardisation in the field of learning technologies had the immediate effect that a number of projects have been put on hold (e.g., e-Textbook, social metadata, widget store for educational content, learner mobility, etc.). The long term effects could be a setback to the ability of standardisation to contribute to innovation within the educational market. The European Commission seems to put a lot of trust in standards being able to «level the playing field for all market players» within education, provided they «remain open» [8]. A response by CEN, only focussing on the threat to their business model, seems to ignore what drives the innovation cycle within learning, education and training (LET). Resistance to pay for standards document is not due to lack of money in this sector, but the fact that a pay-per-document model conflicts with basic values in the education and research community that provides input to the standards development.

The learning technology standardisation ecosystem is fragile and needs to be carefully nurtured to prevent breakdowns. Behind the process models presented in this paper (Table 1) is a simple innovation model, where Ideas form Design, leading to Implementations, and then a feedback loop back to new Ideas.

Innovation in learning technology is driven by cultural and social trends, openness being one of them [2]. The closed model of formal standardisation has no appeal to the most innovative companies and research communities, and therefore, the most promising actors will not even enter the pre-conceptualisation stage of standardisation, let alone stay on through the more tedious phases of negotiations and drafting. And the standardisation bureaucrats cannot fill their place. Most of the contributions to European learning technology standardisation the last ten years have come from experts engaged in European projects. The European Commission has committed the projects to liaise with standards organisation as a means of dissemination. When the experts are university employees devoted to open research and open access, IPR barriers as pay-per-copy represents a dead end at the very beginning of a development process. Furthermore, when the European Commission mandates open access to all results of projects, it is no longer a question of the opinion of the individual, it is a matter of EU policy: «The policy officer made it clear that by open standards was meant free-of-charge specifications» [1].

Even if the research communities are reluctant to contribute, if there is a need one could expect the market, i.e., the industries, vendors and SMEs, to solve the problem. However, the market for learning technologies is very fragmented with a

mix of small enterprise players together with big institutional and even governmental actors - none of them seeing learning technology standardisation as their main field of interest. With a very rapid innovation cycle it is again the flow of ideas that is the challenge. Open innovation is an answer to this challenge, and the companies that manage to cope with the tension of knowledge sharing and protection are the winners [3]. The winners will not engage with closed systems organisations like CEN when there are some many alternatives.

If the project passes the first failure point and enters conceptualisation and drafting phase the need for openness prevails. And this need is observed by formal standardisation as well. CEN and ISO adhere to the principles of transparency and an open and due process, and would not like to be described as not embracing the principle of openness. However, Krechmer [24] have observed that different stakeholders in standardisation (creators, implementers, users) emphasise different aspects of openness (Table 2). Open documents are not an important requirement for standards creators, who are more concerned about the formalities of the process, like open meetings, consensus, due process, and open IPR (lack of patents). On the other side, implementers and users have more practical interests, and access to documents and functional aspects of the specification are more in focus.

Table 2 - Open Standards Requirement (Krechmer 2005)

Open Standards Requirements

		Stakeholders		
	Requirements	Creator	Implementer	User
1	Open Meeting	x		
2	Consensus	x		
3	Due Process	x		
4	One World	x	x	x
5	Open IPR	x	x	x
6	Open Change	x	x	x
7	Open Documents		x	x
8	Open Interface		x	x
9	Open Access		x	x
10	On-going Support			x

The 10 aspects of openness embrace the full circle of standardisation described in Figure 1 and Table 1, what could be described as the ecosystem of standardisation. The case study shows that CEN works from a more restricted

system perspective. When the CEN Standards Director maintains that «for the sustainability of the standardisation system, CEN assumes the protection and legal responsibility for the copyright of its publication», and «CEN and its members are the only entities entitled to benefit from the exploitation rights» [25], is clear that it is the organisational system they are defending, not the standardisation ecosystem as a whole. The business of formal standardisation organisations like National Body Bodies, CEN and ISO is to stage open and due processes and creating consensus documents. The bureaucratic and powerless ways these organisations usually solicit requirements and implementation results (e.g., calls for use cases and questionnaires to National Bodies) demonstrate that they do not take responsibility to support the ecosystem as such. Even with such a restricted core business one could ask if their applied business model is well aligned with their mission. Selling documents is only a means to acquire money, while the real business should be put the documents in use.

More than six years ago a EU study [9] recommended that new business models should be investigated by CEN. In the study on the specific needs for ICT standardisation it was urged that a coherent and harmonised (free) availability policy should be developed for Europe. Selling (paper) documents is not the only way to sustain an organisation in the 21st Century.

Also in the consensus and drafting phases of standardisation, openness is important. In the war stories of formal standardisation, 'the table' plays an important role. Who are sitting around the table, and what are the positions and how to they develop towards consensus? [26]. The challenge of managing consensus processes with active back channels will vary from project to project, and there is no one size fits all. For the learning technology standardisation, however, it has been extremely important to solicit inputs and comments alongside the drafting. Waiting for a formal consultation after the first draft will not be productive. Therefore, CEN WS/LT opposed being limited to document exchange via a password protected repository, not being able to do drafting in a wiki controlled by the project team. Within ICT standardisation open drafting processes are not unusual. Principles drawn up by the Open Stand initiative supported by IEEE, Internet Society, W3C, IETF, Internet Architecture Board and a host of organisations states the following about transparency:

> «Standards organizations provide advance public notice of proposed standards development activities, the scope of work to be undertaken, and conditions for participation. Easily accessible records of decisions and the materials used in reaching those decisions are provided. Public comment periods are provided before final standards approval and adoption.» [27]

Conclusions

Successful standardisation of technologies related to Learning, Education and Training is rare and depending on a lucky coordination of a number of unruly factors. In 2007, the European Office of Crafts, Trades and Small and Medium

sized Enterprises for Standardisation produced this simple list of key factors that could change the perception and the use of standards:

- Create better access to them,
- Effectively enable the users to participate in making them,
- Reduce the cost of using them,
- Make the text of writings simple and accessible to the unqualified (not standard specialist) reader. [9]

The SME interest group (www.normapme.eu) mapped reasons why people like or oppose use of standards, and they all centred on rather mundane aspects of running a business. It simplifies life to work with the same format all the time; it provides security for safe use fit for purpose. On the other side, multiple solutions to the same purpose are not good; neither is the suspicion that one commercial business solution is privileged. More transparency and lower barriers to use are two recommendations that could improve legitimacy of standards.

The fragile standardisation ecosystem with different actors playing different roles in different phases of the standardisation cycle is prone to failures. When a project is initiated by university researchers, scoped and conceptualised by standardisation managers, drafted by standards experts, and implemented by SME entrepreneurs – and they all are partly different persons, coordination and knowledge exchange become imperative. In the days of the Internet, any barrier to flow of information between different actors of ICT standardisation may impact on the quality and even the sustainability of the project. This study shows that the European Standardisation Organisation is moving in the wrong direction by establishing barriers that are not easy to understand or accept by the stakeholder communities. More closed working processes, price barriers to dissemination of results, and asking fees to allow expert provide gratuitous input are all actions that are breaking with the innovation model now being promoted by entities like the European Commission [8].

More research is needed to explore why a standard setting body like CEN feels that their business model is threatened by free-of-charge CWAs from a rather peripheral Workshop like CEN WS/LT. «The commercial exploitation of the Publications is fundamental to the maintenance of the CEN-CENELEC system as a whole», states the guidelines on distribution and sale of CEN publications. It seems that CEN has manoeuvred the organisation into a corner where the tiniest crack could crush the whole building. This author doubts that CEN members ever have sold a CWA on learning technologies, simply because there is no market for such documents. There is a need for the standards, but the market expects such documents to be free, and will have its ways to get them for free. The ICT industry is not like the building industry that is willing to buy a complete set of building standards for each new building project.

When a «substantial part of the standardisation work is financed by voluntary and gratuitous participation from businesses, through their participation in committees, financing of projects, etc.» [25], and there is no market for these standards and no sale, one would think the «obligation to protect the [commercial] value of these Publications» should be irrelevant, and other values of the CEN system could come into play. The same Guidelines 10 promotes the

principle of «the widest possible dissemination and use of [25] Publications throughout the world». After all, the sales of documents are only a means to an end; and CEN should look for solutions how to cover its developing cost through other schemes than sale of paper copies. This would imply that formal standardisation acknowledge that they are part of a content industry that need to update their business model to serve the needs for innovations in a new and digital economy.

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[2] InLOC stands for «Integrating Learning Outcomes and Competences» - CWA 16655-1 ftp://ftp.cen.eu/CEN/Sectors/List/ICT/CWAs/CWA%2016655-1.pdf
[3] The author has acted as vice-chair of the CEN WS/LT since 2007. The conclusion of the Technical Board meeting is from a undisclosed source attending the meeting.
[4] The author has been participation at national delegate expert since the beginning of the committee.