Has the time come to discuss technical affordances of standards?

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Abstract: Formal standardization communities are searching for ways to improve their approach. Process improvement is often the primary focus for this discussion. This paper explores the possibilities to put more emphasis on the technical affordances of standards. A case study is presented of a proposal to reform European standardization practice. Technical quality issues are now put forward as important metrics. However, the technical quality criteria are still vague and more research is needed to come up with the dimensions for a quality discourse on technical aspects of standardisation.

Keywords: standardization, process improvement, technical standards quality

1. Introduction

Doubt is raised about the positive contribution of standardization to the development of the emergent field of learning technologies [1]. Also, looking beyond this particular domain stakeholders acknowledge the need to improve the standardization system, especially in the field of ICT [2]. In times of crisis and self-scrutiny, one gets a chance to ask the more fundamental questions of how standardization is handling issues of quality related to processes and outputs. The purpose of this short paper is to create awareness of this discussion, and to use a small case study of a proposal from the European Commission (EC) as a foundation for suggesting some directions this new discussion might pursue, particularly in the domain of IT for Learning, Education and Training.

According to the World Bank standards "increase productive and innovative efficiency" [3]. EC concludes that "the benefits of standards for the European industry are tremendous" [4]. Therefore, the incentives to improve the standardization system are strong, and the EC has launched an "EU standardization proposal" to be implemented from 2013. The EC wants to speed up the time it takes to make standards; to expand the remit of standards to cover services, management systems, environmental and social issues; and to make sure that appropriate standards developed outside the Europe are being implemented and used [5]. Similar initiatives are seen also in other parts of the world, e.g., in Australia [6].

The proposed new EU regulation draws up principles and rules to ensure broader representation, increased transparency, better financing, etc. [5]. The Australian initiative focuses on the need to demonstrate 'net benefit' on Public health and safety; Social and community impact; Environmental impact; Competition; and Economic impact [6]. These initiatives seem to take the technical quality of the standard as given; it is the market relevance and uptake that are identified as challenges to be addressed. However, a good purpose and justification for a standard is no guarantee for the standard to be well scoped and designed [7]. Therefore, the question raised in this paper is whether we see any opening for discussing technical affordances of standards in the current initiatives. If so, how should this discussion be structured?

2. Related work

Hoel and Mason [8] have argued that qualities of standards should be addressed both in relation to process and product. With 'process' is meant the activities setting up the work towards a standard, i.e., choosing the right standard setting body, organizing a transparent process, ensuring stakeholder engagement, etc. With 'product' is meant the outcome of the standardization process, the standard itself. An improved process is not possible without a better understanding of the relationships between the three parts that make up standardization: process, product, and domain [9]. The last part influences and is influenced by both process and product, as e.g. the domain supports certain processes and is best served by certain standards.

Much of the standardization research has been focused on the process aspects of standardization [10]. The process is also pivotal in the Directives that governs formal standardization [7]. The Directives specifically warn against discussing methodologies or technical issues that is not directly related to the standardization project at hand. This is called the 'performance approach', which is designed to leave maximum freedom to technical development: "Whenever possible, requirements shall be expressed in terms of performance rather than design or descriptive characteristics" [8, 11].

The quality of the standardization product, especially within the ICT domain, has often been discussed from a top-down perspective focussing on principles like correctness, clarity, relevance, comparability, economic efficiency, and systematic design [12]. However, another bottom-up perspective is also possible, discussing if the standard is well-formed, understandable, of the 'right size', etc. [13]. A third approach would be to discuss quality in relation to adoption, market uptake and software quality [14]

Quality issues are brought to the fore when a community is invited to accept as their own product that are developed by 'outsiders'. This is exactly what is happening within European formal standardization, where one of the proposals to speed up processes is to recognize technical ICT specifications of non-European standardization bodies. In the following this paper will do a qualitative document analysis of an annex to an EC proposal regulating how this recognition process should be done [5].

3. Case study: Accepting the work of others – adapting European standardization

A two page annex draws up the "requirements for the recognition of the technical specifications in the field of ICT" [5]. Three classes of requirements are identified, which this paper terms Relevance, Process and Technical Quality. Besides the Relevance, requiring that the specification is accepted in the market and does not hamper interoperability with the implementations of existing standards, the requirements fall into the main categories of Process and Product discussed above.

Process. The Process requirements deal with openness, consensus, and transparency, in addition to the mandate and aim of the organization that has developed the specification. These are known operational directives of the international standards bodies. "Most national or regional bodies employ similar principles of fairness, adherence to procedures of due process, reasonable notice, openness, inclusion of stakeholders, and decision by consensus" [15].

Product. The six requirements in the EC proposal related to the Product, i.e. the technical specification in question, pick up themes from the international standardisation discourse, but seem otherwise to be framed more by the context of improving European standardisation. Maintenance, availability, and intellectual property rights relate back to the process and the operational qualities of the organization that publishes the specification. These requirements pertain to the standard as a document: Will we have an updated version in the future; will we be able to use it on reasonable terms; and are the IPR issues sorted out?

The last three EC requirements to externally developed standards relate directly to the technical characteristics of the specification: 1) relevance; 2) neutrality and stability; and, 3) quality. It is noteworthy how far the requirements venture into a discussion on technical design principles for the standard.

The *relevance* criterion has two parts: (i) the specifications should be effective and relevant; (ii) specifications need to respond to market needs and regulatory requirements [5]. The first part is partly redundant (defining relevance by being relevant). However, it is noteable that the two parts are not merged, leaving a space related to effectiveness that is separate from the market and regulatory relevance space. This could be interpreted as an invitation to identify and discuss characteristics of the specification in question that are related to how the designed artifacts, e.g., information model, vocabularies, etc., works in a technical implementation.

The *neutrality and stability* criterion has also a mix of market and technical concerns, with three parts, one more concrete than the others. (i) "Specifications do not distort the market or limit the possibilities for implementers to develop competition and innovation based upon them." Even if it is may be difficult to prove violations, it clear what is meant by this requirement. However, it is less clear what is meant by the requirement that (ii) specifications whenever possible should be "performance oriented rather than based on design or descriptive characteristics"; and (iii) "based on advanced scientific and technological developments". The latter is an ideal goal, based on an assumption that technological development in the ICT field progresses steadily in a more beneficial direction. The part about performance orientation, seems to invite to a discussion about principles of Information Systems Design, preferring specifications that 'work' to specifications that are 'developed the right way'.

The last criterion on *quality* is split in two parts, one more specific than the other. It may be easy to judge whether "standardized interfaces are not hidden or controlled by anyone other than the organizations that adopted the technical specifications". The part on "quality and level of detail" leaves on the other hand more room for discussion. The quality and the level of detail should be "sufficient to permit the development of a variety of competing implementation of interoperable products and services". Here the level of detail points directly to the design characteristic of the specification. What is the right level of detail? Is it "just enough" or is it necessary to strive towards a level of "correctness", giving an extensive and fully covered representation of the domain in question?

4. Discussion

The backdrop for this study is participant observation over a decade from both European and international ITLET standard groups, and a study of Directives setting up procedures for formal standardization [7]. When setting up ITLET projects in CEN and ISO there is nothing in the procedures that encourages discussions on approach, methodologies and general technical aspects of standards. This may be explained by the Directives [11], which stress methods neutrality. However, it could be argued that more emphasis on questions like rationale and scope, technical approach, base standards, technological context, etc. could strengthen the technical quality of the output of standardization. Therefore, it is interesting that EC requirements raise discussion about the technical affordances of standards as part of an effort to define what a good standard is. Even if the main focus is on acceptance in the market place, e.g., through a due process, technical design qualities are not seen as out of scope or in breach with methods neutrality.

5. Conclusions

This study has described standardization as an interrelationship between the standardization process, the outcome of standardization, and the domain served by standardization. Standard governance has mostly been concerned with process aspects of standardization and to a great extent excluding technical aspects from a discussion of what provides quality in standardization. This case study shows that the issues related to acceptance in the market space seem better defined than technical issues, which points to the need for more theoretical work in this area. When a dominant stakeholder as the European Commission opens up for questions related to technical affordances it gives an impetus to explore new avenues for a standardization discourse. What lies in an "effective" standard and the optimal "level of detail" [5] are questions that should be put forward for further research.

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