STANDARDIZATION AS A PROFESSIONAL CONVERSATION - THE NEED FOR AUXILIARY MEANS

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ABSTRACT

Standardization is a particular kind of professional conversation negotiating meaning among stakeholders who would like to inscribe their interests into abstract, formal and often technical specifications of technology. This paper examines the need for cultural tools to facilitate this negotiation. In the design of learning technologies the teachers are often alienated by the technical lingo of the educational technologist. On the other hand, the technologists get very bored by the abstract and often imprecise terminology used by the educational community. However, if the communication between these two communities is not good, we do not get the tools and learning technology we need to support teaching and learning.

The paper will look into different theoretical and practical aspects of the professional conversation in the learning technology and standardization field. Use cases might be such a tool to enhance communication, identified by an standards body as well suited to represent user needs that often have not a voice of their own in the standardization process. A case study of an international meeting presented in the paper, indicates that the introduction of such tools will not be easy. Inductive down up approaches, e.g. use cases, might be more difficult to implement than top down approaches with abstract concepts as boundary objects.

1.   INTRODUCTION – THE STANDARDIZATION PROCESS – WITH TRANSPARENCY AS A GOAL…

When standardization is successful there is nothing to discuss. In the age of mass production we are daily met with thousands of standards we do not notice. Buying a new photo printer to your PC does not bring up the question of paper size; listening to a CD does not highlight the issue of sound track formats. It is easy to forget that most standards have a long and demanding making.

If you try to read a standard you will certainly find a technical specification written in a value neutral tone, littered with "three letter words", - clearly the domain of the technologists. Even if the end result is technical, the beginning of a standardization process is far from being characterised by words as formal, abstract, bureaucratic, value neutral. The process leading up to an international standard is grounded in real problems, fierce competition, academic ambitions, multicultural exchange, conflicting interests and lengthy negotiations.

Standardization is a complex negotiation of meanings and interests. It is a social process of aligning different interests, with communication and interaction among diverse and often conflicting parties as the central activity. How is this process facilitated? What are the characteristics of a professional discourse that is able to inscribe partly opposing interests into specifications that after a short time nobody questions?

We will raise these questions looking into the field of learning technology standardization. This study is based on personal observations during participation in a few standards committee meetings and work within the field as a project coordinator of the Norwegian eStandard project (Hoel, 2003; www.estandard.no).

1.1 ... and conflict of interests as a starting point

"Standardization, in the context related to technologies and industries, is the process of establishing a technical standard among competing entities in a market, where this will bring benefits without hurting competition" (http://en.wikipedia.org/wiki/Standardization). This encyclopaedia definition of standardization highlights the value based, instrumental aspects of the process. The aim is to come up with practical solutions that benefit as many stakeholders as possible, without prolonging the negotiating process.

Within learning technologies there is a wide range of standardization activities, some are part of official organizations

recognized by governments, and some are part of consortia initiatives organizing industry and other stakeholders. Although the activities are international, multicultural and spanning many sectors of society, they are upheld by a relatively well defined Community of Practice (Lave and Wenger, 1991; Wenger, 1998) with members who often meet in a number of standardization bodies, "wearing different hats".

Typically, the process starts with user needs and/or input from a research community active in a related area. During the entire process from problem scope, specification work, testing and finally approval of an official standardization body as a standard, there is a problem of representation. The end users for learning technologies are the learning community, students, teachers and a workforce eager to expand their knowledge. However, there are very few educators present in standardization meetings. So one interesting area of study is to learn more about how different interests are represented and gradually inscribed into specifications of technology.

To expand on what is meant by representation we will briefly turn to my observations of an IMS SIG meeting on ePortfolios in May 2003[1]. The task was to come up with the scope of a future ePortfolio specification, and this was the very beginning of such an endeavour.

One representative of the US labour authorities was pressing very hard to limit the scope to quality assurance of the learner's competencies reflected in the ePortfolio (ePortfolio being something you show to others to prove what you are capable of). Another representative from the academic sector was equally determined to capture that ePortfolios should (also) give the learner the opportunity to reflect upon their own work, to learn more about their own learning (ePortfolio being a learning tool). It was obvious to me as an observer that the two participants here acted as representatives of particular stakeholders. They (and other participants as well) seemed to rely on relative strength of their constituency and their organization to include or exclude from the scope elements that the ePortfolio specification should solve. The arguments were head-on, in the form of "We think this or that should be within or out of scope...". It was strikingly little use of "discussion artefacts", like reference to pilot implementations of ePortfolio solutions or documentation of user needs.

A shared understanding was reached the next day, when a rather abstract definition of an ePortfolio reconciled the two positions. However, the group was not quite satisfied with their progress. The SIG coordinator voiced a proposal to gather use cases to learn more about the needs the specification should meet.

It is my interpretation of the call for use cases that the SIG (or at least the coordinator) felt there was a need for better representation of interests, to do the specification work properly. And the group specified their need of a representation artefact as being of the type of use cases.

The integration of use cases in the IMS work process - which the public was made aware of when the consortium re-launched their web site late 2003 (IMS, 2003b) - tells us that use cases as a means to facilitate the negotiation of meaning during a standardization process, is worth a closer study. Use cases could be a cultural tool (Lave & Wenger, 1991; Candlin et.al., 1999) that used for mediation between the various "cultures" that take part in learning technology specification.

2 REPRESENTATION OF INTERESTS - UNDERSTANDING STANDARDIZATION ON A MACRO LEVEL

To examine what role cognitive artifacts (Hutchins, 1995, cited in Måseide, 2003), cultural tools (Lave & Wenger, 1991) or boundary objects (Star, 1989) plays in the standardization process you need transcripts of conversation. We do not have such data and have to ground our study on personal observation from participating in meetings, written reports etc. This study therefore only serve as a preparation for a more thorough research based on a range of data sources. Even if we do not have enough data to give a thick description (Sarangi & Roberts, 1999) we should be able to describe some of the dynamics of the professional discourse of learning technology standardization.

Before we try some analysis of a particular meeting, let us then contextualize the activities we observe going on in the initial phases of scoping for a specification. It is self-evident that participants in international standardization have a multi-cultural background. The working language is English, and even if their command of English is good, language problems are bound to cause misunderstandings and need for "repair". Even if meetings very often are open to all experts who want to contribute, most participants have met each other before, or know the work of each other. Most of the actual specification work is done between meetings. And the meetings are used to test positions, build alliances and mark directions for further work.

As already said, many participants "wear different hats" in different organizations. Some time they represent their institution (e.g. a company, a university, governmental body), and some time they are present as experts in some

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[1] IMS Global Learning Consortium has a range of Special Interest Groups (SIGs) organizing the discussions leading up to draft specifications. IMS is an American dominated consortium of academia, industry, government and others that is very much geared to producing specifications in demand from their stakeholders, that could be implemented within a reasonable short time - ref. http://www.imsproject.org/

academic capacity. So when a person makes a proposal in a meeting, it is very likely that it is weighed against a host of interests and positions that the man (women are not well represented in these fora) has represented in the past.

A talk-in-standardization-setting is a special form of professional discourse, well suited for Critical Discourse Analysis (CDA). Sarangi and Roberts (1999) contrast CDA with Conversation Analysis (CA) and note that CDA uses analysts' categories to make sense of their object of study, while CA methods use participants' categories. "Whereas CA derives its theory from the interaction order, CDA draws on social and philosophical theory to read into text" (Sarangi & Roberts, 1999).

One social theory that often is being used to understand socio-technological systems is Actor- network Theory (ANT) founded by the French sociologists Bruno Latour and Michel Callon. Hanseth and Monteiro (1997) found ANT very useful analysing the activity of standardization. They use a "minimalist" version of ANT with the core concepts of inscription and translation to describe how technologies, e.g. e-learning specifications, become embodied with interests. Inscription describes how concrete anticipations and restrictions of future patterns of use are involved in the development and use of technology (Hanseth & Monteiro, 1997). Translation is the multifaceted negotiation where different actors construct definitions and meanings and re-interpret, re-present or appropriate other's interests to one's own. With translation one and the same interest or anticipation may be presented in different ways thereby mobilizing broader support. A translation presupposes a medium or a "material into which it is inscribed", that is, translations are "embodied in texts, machines, bodily skills [which] become their support, their more or less faithful executive" (Callon cited in Hanseth & Monteiro, 1997).

Design is in ANT terms translations. The designer – and in some respects participants in standardization meetings play the role of designers – works out scenarios describing the use of the systems, and some scenarios are inscribed into the system or in our case, the learning technology specification.

Faced with the actual proceedings of a standardization meeting, ANT gives only an overall picture of what is going on. The dangers of trying to answer the why question before you have described how the discourse took place, is quite evident. ANT invites you to identify the different interests sitting around the table and encourage you to follow the different steps and positions taken on a backdrop of commercial, organizational, personal and other interests. It is for example very easy to attribute the points made by the labour department representative and the university representative in the case we introduced as mere reflections of position and affiliation.

Given the introduction of use cases as a means to ground the ePortfolio specification process more closely to the different user communities, we might seek instances of standardization where use cases are brought in as cultural tools or boundary objects. Boundary objects are those objects "that both inhabit several communities of practice and satisfy the informational requirements of each of them" (Bowker & Star 1999; see also Wenger 1989).

A use case is designed to serve as a boundary object. It might be an informal narrative description of user needs related to a particular task or problem area, outlining the players involved, assumptions and a scenario of activities (IMS 2003a, 2003b). The main point is that everybody should be able to write a use case. And once written, it should make people outside your own community, e.g. members in a standardization committee, understand your needs and visions.

In December 2003 uses cases was meant to be used in a session arranged by CETIS, the British Centre for Educational Technology Interoperability Standards. Even if we do not have transcriptions of the proceedings, we have data that allows us to analyse the use (or lack of use as it turned out) of use cases as tools for understanding stakeholders' needs.

3. THE MEETING ON GLOBAL IDENTIFIERS - WHAT WENT WRONG? TOWARDS AN UNDERSTANDING ON A MEZZO LEVEL

The need for global identifiers within learning technologies raise from the fact that learning resources are more and more distributed around the entire globe.

"Sometimes you want an identifier to unambiguously refer to a resource: punch in a loved one's phone number, and you expect their phone to ring, and no other. Much the same identifier - resource functionality would be desirable for learning objects, but that has not been sorted yet. CETIS organised a meeting with a broad swathe of stakeholders to address the issue." (Kraan, 2003)

The meeting was well prepared, and the participants were the top names in the field, coming from Australia, Great Britain and USA. To help us understand the meeting we have several written documents, some presented beforehand: A discussion paper (Powell, 2003) that had generated the interest that led to CETIS agreeing to convene a working meeting; a call for use cases addressing the need for identifiers; an issues memo enclosed to the agenda presented in a mail to the participants where the convener states the intention of the meeting.

As a freshman to this kind of meetings, I kept a low profile making observational notes. I was sitting beside the note taker, seeing that he made very detailed minutes tracking the sequence of the discussion. This is to a large extent

reflected in the final report of the meeting (Campbell, 2003).

A few days before the meeting took place the convener stated in a mail message: "I've deliberately left the agenda for the afternoon very flexible in order to give participants the opportunity to prioritise topics for further discussion". No doubt the morning was well planned, which the next clause stresses:

"Also attached is a summary of issues which I've distilled from your homework. Thanks to all of you who submitted papers and use cases, this is an extremely valuable body of work. All contributions have been uploaded to the identifiers resources page on the CETIS website at http://www.cetis.ac.uk/static/identifiers I would strongly encourage all of you to read over the contributions of your colleagues prior to the meeting. (..) I'd also like to draw your attention to two other new resources on the website..." (Mail from Campbell prior to the meeting).

The telling touch to the wording is toned down by using words "out of context" like "homework", and humour ("...and Scott Wilson has produced two diagrams which provide a very interesting comparison (seriously!) of identifiers for learning objects and identifiers for tins of beans"). However, all participants knew that the agenda for the morning of October 21st was well laid out.

3.1 Presentation of use cases
The meeting started with an overview of the uses cases, after welcoming and housekeeping remarks and introduction of all participants. The 12 use cases showed that a great number of identifiers are needed when learning objects are aggregated and disaggregated, and the different parts are spread throughout the educational community, each part with an owner who wants credit and would not like her work mixed up with others.

The complexity of the question at hand seemed overwhelming, when the chairwoman embarked on the next item on the agenda, Issues overview. This was just another go at the structuring of the working meeting. The Issues paper was read by all before the meeting. At the end of the walk through the chairwoman stresses the point on reality check ("Need solutions that are simple, workable and easy to manage."), points to the use cases as a good starting point, adds that any issue is in scope of discussion (indirectly alluding to what she said earlier on that the only issue out of scope was human identifiers). And the floor was declared open.

3.2 First phase of the discussion - footing and struggle over frames

A professional discourse of this kind is like a game of chess: The initial "moves" could be decisive. With 23 participants it is a bit of "footing" to do before the course of the discussion is clear to all. Let us first describe what happened, which is well recorded in the report (Campbell, 2003).

An issue is drawn from problems inventory (cost). Two participants make factual comments:
1 A: - legal issues need to be distinguished from cost issues
2 B: - need to discuss cost benefits...
Another issue is drawn (rights management):
3 B: - we can not analyse the business model unless.....
4 C: - there will be different business models...
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5 D: - we need a set of rights management use cases.
A third issue is put on the table by C (local vs. global identifiers):
6 C: - some repositories may be ephemeral (e.g. individual's file space), and may not need identifiers for external use. We need to ask when identifiers are needed.
7 E: - all content starts off in ephemeral repository, identifiers should be assigned at this stage.
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8 The chairwoman: - we need use cases to identify at what point a global solution is necessary.
9 A: - we have vastly underestimated the scale of the problem .... If there are $5*10^9$ people worldwide, $5*10^7$ eLearners (1%) will require $5*10^{10}$ identifiers.

The initial contributions are part of a struggle over frames (Goffman, 1974). Even if the organizer of the meeting had been very particular about which discussion frame to use, this is not taken for granted when the floor is opened. Due to the nature of deference and demeanor (Goffman, 1967) within standardization settings frame struggles are often posed as "to the point" contributions. Positions are demarcated as single statements about aspects of the issue under discussion. The first excerpt above is an example. When the frame struggle escalates you get a typical discussion on scope. (There was a reference to scope in the issues paper, where human identifiers were put out of scope.) What follows the part cited here is a very marked discussion on scope. It is interesting to see what might lead up to this.

Line 1 - 4 could be read as an effort to decide the context of discussion. Are we talking about the generalized concepts, or do we want to discuss concepts in context. In line 5 D is pointing towards use cases. One might think that D, being the author of the initial position paper and related to the host organization of the meeting, wanted to strengthen the

frame position of the chairwoman. In line 8 she repeats "we need use cases"; and then A, the first speaker in the discussion, take the opportunity to span the discussion (line 9) from the local and ephemeral context to the global mind-blowing abstraction as a number like 5*1010 is.

3.3 The abstract turn

What happens next stands out from the rest of the discussion. It is very seldom that experts in these settings talk on behalf of other experts being present in the same meeting. This is in breach with the moral order of professional discourse and actualizes Goffman's concept of demeanour (Goffman, 1967). The incident is so recorded in the report from the meeting:

> "Given the scale of the task and the limited time available NN [name withheld, author's remark] suggested that the scope of the morning's discussions should focus solely on the abstract concept of identifiers within the domain of education. However some participants felt it was too early to exclude experiences and solutions from other domains. Use cases, implementation issues and the type of resource being identified were ruled out of scope until the afternoon although all participants agreed that, in terms of resources, it is important to distinguish between the concepts of a work, a manifestation and an instance." (Campbell, 2003)

What happened was that one expert, the only one representing an organization that had a particular solution to the problem at hand, proposed that another expert should be allowed to present a limitation to the scope of discussion so that we could develop a unified concept of an identifier within learning technologies.

A discourse refers to spoken language beyond the sentence, as it occurs in any context and any form (Tannen 1989, cited in Måseide, 2003). "Reading" the discourse in sequence we see that the contribution in line 9 above could be interpreted as a pre-emptive move to undermine the use of use cases as a discussion facilitator and steer the line of arguing in a more abstract direction. However, we would need more evidence, e.g. video recordings of gestures, eye contact etc., to justify this theory.

3.4 The nature of an abstract object of discussion

Now that it was decided to follow an abstract path, what happened with the utterances and the flow of conversation? Again we lack good transcripts to justify such an analysis, which will change focus from the footing activities more to the relation between the object of discourse and the utterances made. The frame is set; the use case angle prescribed in the agenda is ruled out. The meeting tries to relate to the proposed dimensions of an abstract identifier (Uniqueness, Persistence, Scalability, Interoperability, Readability, Digital and perhaps Actionable). How does the discourse flow? How easy is it to stick to the agreed key (Goffman, 1974)?

> "Participants discussed what the term "unique" refers to: the identifier or the relationship of the identifier to an entity? It was agreed that it is the relationship of the identifier to the entity that is unique." (Campbell, 2003)

The minutes of the meeting is now changing to a more indirect report. This might indicate that the discussion is more vague and difficult to follow. It does not give meaning to attribute points of view to different persons. Some argumentation could also be accused of being circular or tautological, like the two sentences cited above. Uniqueness is more or less implied by the very concept of an identifier. Further, an identifier implies that there is something to identify, which is something else than the identifier itself. Then it is hardly any surprise that it is the relation of the identifier to that entity that is unique. You do not need to go beyond logics to draw that conclusion.

> "Participants also agreed that while uniqueness should be the intention, in practical terms this is difficult to enforce." (Campbell, 2003)

This sentence shows us that it is difficult to keep a discourse on an abstract track. It is tempting to relapse to the world of concrete objects:

> "Commenting on S. Wilsons's diagram comparing learning object identifiers to product identifiers (Appendix 2) one participant remarked that while products such as tins of beans may have a complex series of unique identifiers a shop keeper will ignore these and simply stick a price ticket on the top." (Campbell, 2003)

One observation we would have liked to have documented in transcripts during this part was the frequent discussions about scope. Framing activities seem to be sparked when you could suspect a contribution to be a downkeying (Goffman, 1974) to deal with implementations or use of different identifier schemes. Use of examples could be interpreted in this way.

> "It was generally agreed that the relationship of the identifier to the entity must persist even if the entity itself ceases to exist. For example an ISBN number will persist and will not be re-allocated even though the book it refers to is out of print." (Campbell, 2003)

Here the example is used as a cognitive tool to clarify the persistence aspect of an identifier.

At this phase of the discussion you did not need video recordings to tell that the whole group was not at ease with the way the discussion went on. The chairwoman was struggling to sort out what was in scope of the discussion, asking for new contributions. Now the oldest member in the group, the CEO of IMS, stepped up to assist the chairwoman taking notes on a flip over. It seemed that the more abstract the issue under debate was defined, the greater need to have some reification of the talk on paper.

This part of the discussion was summarized in two tables written on the flip over. The report reads NN: "summarised the discussions by stating that if we are referring to identifiers only, and do not require them to be unique, then we do not need semantics. However in the real world the only way to achieve uniqueness is to add semantics that limit scope." (Campbell, 2003)

The discussion was not allowed to divert from "identifiers only". When the participant who proposed this approach, summarizes by indicating that the discussion has been in another world than "the real world", he is bringing to the fore the hidden layer of discussion, the struggle of scope and of which tools that should facilitate the discussion. Again we would like to have video data to confirm my impression that this was noted by the participant as I remember it by exchange of glances, change of body positions etc.

According to Jon Heritage (1997) "Conversation Analyses are ... simultaneously analyses of action, context management and intersubjectivity because all three features are simultaneously, but not always consciously, the objects of the participants' actions". At the point when it was time to conclude the "abstract discussion", the participant were very conscious of the multiplicity of levels of the discourse, and they made themselves ready for the next part, which according to the agenda after lunch should look into Use cases, Requirements, Solutions and Best practice guidelines.

The report captures the new scope discussion well:

"A. Powell suggested that as the top down abstract analysis had indicated that URIs are a logical format for identifiers the group should now take a bottom up approach to identify the functional requirements from the use cases and ascertain whether URI or other candidate schemata meet these requirements. URI has the advantage of providing a governance scheme and rules for establishing uniqueness. NN [name withheld, author's remark] agreed and suggested that URI should first be matched against the abstract requirements." (Campbell, 2003)

From top down abstract to bottom up? The proponent of the abstract turn agrees, - and suggests that they stick to the abstract route.

3.5 Abstraction fatigue

After the break there was a certain feeling of fatigue. You could see the participants looking more often at their watches, checking flight schedules and that like. The report says that "the final task undertaken was an attempt to highlight contentions issues and identify core qualities for identifiers within the domain of education as represented by the use cases". However, the use cases were never more referred to. Instead the participants explored the abstract concept of identifiers, trying to be more concrete, identifying "core qualities". An alternative to extract these core qualities from the use case or from the summary of use cases presented at the beginning of the meeting, the participants resorted to the discussion paper that started the process ending up with the London meeting.

As before lunch, the different concepts, e.g. uniqueness, persistence, resolvability etc., were described abstractly, by lexical definitions, not by example. The new approach was conducting of a "straw poll". The qualities were listed at the flip over, and every participant raised their hand to give their meaning of the concept being a core quality of an identifier, or if it needed further discussion or was contentious.

When that exercise was done, the time was nearly out, and one still had to agree on some actions. The report sums up: "Once the core qualities of identifiers have been listed and agreed it will be necessary to map them against the existing use cases. However more use cases are still required. Action: L. Campbell will circulate a request for further use cases to IMS, CETIS SIGs etc." (Campbell, 2003)

There are more actions, like working more with definitions, publish a report and liaison with other standardization bodies. Web journalist Wilbert Kraan has a rather laconic comment on the outcome of the meeting and what needs to be done:

"As the meeting has already addressed some of the more philosophical aspects of identifiers, the next steps involve gathering use cases from everyone with a stake in the issue. The participants themselves have already come up with a respectable list of cases, but the "global" and "forever" nature of the issue means that this really is one problem that needs thorough input from all concerned." (Kraan, 2003)

4 DISCUSSION

When we regard the outcomes of the meeting with the aims, we see that something went wrong in London[2]. There might be many reasons why this result, and we will not speculate on whom to blame or if there was any party that might be interested in a lesser outcome than intended. Our focus is the auxiliary tools participants in standardization fora use during translation of their interests into concepts and definitions that could be inscribed into learning technology specifications. We see that IMS and CETIS point their finger towards use cases. We have not really observed use cases in use, although the first point of the London agenda was presentation of use cases gathered from the discussants. What we did observe, was the use of abstractions as cognitive tools.

If a definition of concept will be inscribed into a specification, depends on it's grounding, either in recognizable practice or other well defined concepts. According to actor-network theory specifications are part of networks that are more or less stable. Standards (e.g. the A4 format) are such stable networks. Specifications[3] typically are part of unstable networks and generate a lot of adjustment activities and frame struggles. In this line of thinking you might talk about the stability of concepts. To use unstable concepts, e.g. the concept of an abstract identifier, as the single instrument of mediation of interests and meaning, is associated with considerable risks.

How risky this is, we observed in the London meeting. We experienced an "energy leakage" during the discussion, resulting in compromising the decision made at the beginning of the meeting, that the morning's discourse should follow an abstract route, with use cases as the entry point after lunch. It was not only the identifier problem itself that drained energy, we could observe a lot of footing activities, working with the context of action alongside acting on the subject matter itself. Cultural differences and different stakeholder interests of course add to the efforts of such meetings.

Would use cases have been a better facilitator? This is to be studied. We will end our discussion looking into the role use cases have to fill in a discourse, and see if the formula of a use case IMS recommends matches these criteria.

4.1 Boundary objects and use cases

Hutchin's concept of 'cognitive artifacts' might give a mentalist bias to the way we look at 'discussion tools'. However, his distributed cognition framework seems to provide a mechanism to bridge the worlds of social and cognitive behaviour, as well as technical and domain understanding (Ackerman & Halvorsen, 1998). We would prefer the concept of boundary objects that Susan Leigh Star introduced in 1989, defined as "objects that are both plastic enough to adapt to local needs and constraints of the several parties employing them, yet robust enough to maintain a common identity across sites". The use of boundary objects is one way of managing the tension between divergent viewpoints. Boundary objects capture well the role of objects that inhabit the space of negotiation at the interfaces and serve to support cooperation between participants without agreement about the classification of objects and actions. Yet boundary objects can inhabit several communities of practice and satisfy the information requirements of each of them. This does not mean that use of boundary objects requires that participants need to have a shared understanding to establish coordination. (Bowker & Star, 1999)

Star and Griesemer (1989) first introduced the concept in studying a museum, where the specimens of dead birds had very different meanings to amateur bird watchers and professional biologists, but 'the same' bird was used by each group. The dead birds allowed the bird watchers and biologists to coordinate their activities even though they had completely different understandings. "Boundary objects arise over time from durable cooperation among communities of practice. They are working arrangements that resolve anomalies of naturalization (at-homeness with categories or objects) without imposing a naturalization of categories from one community or from an outside source of standardization" (Bowker & Star, 1999).

Use cases in the generic form of the IMS definition are typical boundary objects:

> "A Use Case is a description of some activity usually involving a person and a computer system or between two or more systems. Use Cases can be informal, such as simple narrative descriptions, or very formal, such as those used in Software Engineering." (IMS web site)

IMS employs use cases to help capture information about the context, activity and requirements involved in an area of specification development. To write a use case should be so easy that lay people to learning technology and standardization should be able to write them with ease. The typical use case is no more than two pages; describing the

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[2] "The primary aims of this event were rather to collate the requirements outlined by participants and other bodies in an attempt to identify the basic characteristics of identifiers, to map these characteristics against use cases and, finally, identify which specific technological solutions were capable of meeting the diverse requirements of the various use cases." (Campbell, 2003)

[3] Before standards become standards, they are specifications. In some meanings of the term, standards are specifications that have passed formal standardardization bodies.

players involved in an act, assumptions; a narrative description, perhaps some examples of a transaction, and a short description of what possible error situations.

A good use case is also rather abstract. However it is related to a need of a stakeholder who wants to do something that cannot be done with the technology at hand. The idea is that experts sift through the use cases to see what is already covered by existing specifications, narrowing down the white spots on the map.

It is obvious that use cases may help focus a standardization discourse. The uncertainty lies in the grounding the limited number of use cases might give the specification process. In other words, when do you know that you have enough use cases, not to speak of the right ones? And if you are not sure of the quality of your use case, it might spark another loop into the abstract world of concepts yet to be defined.

5. CONCLUSION

Although this study would have been strengthened by having "micro level data", we have been able to demonstrate some characteristics of the professional discourse of standardization. We have spotted a "socially distributed cognitive system - which is 'visible through the window of social discourse'" (Cicourel 1990, in Måseide, 2003), or should we rather say professional discourse. By looking at the sequence of events we have examined how "members themselves invoke a particular context for their talk" (Silverman, 1999). We have seen that although a formal meeting is well prepared with strong efforts to focus on particular contexts, the dynamics of the particular community of practice and the interaction itself spur unexpected results.

The professional community itself has identified a particular kind of boundary object to be used as a cultural tool. In all conversation such tools are in use. We have not been able to establish if use cases are ideal tools to be used in standardization discourse. However, we have argued that relying on raw intellectual force by pure definition efforts using abstract categories, could lead to instability in established actor-networks, drain the discussants' energy and increase the need for repair work (Goffman, 1967).

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