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Translation in XBRL Standardization: An Actor-Network View

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Abstract

eXtensible Business Reporting Language (XBRL) presents new opportunities for integrating information flow within communities of diverse organisations thereby significantly enhancing the business information supply chain. Vital to XBRL success, its standardization is proving to be challenging. This paper investigates the phenomena that occur when heterogeneous actors interact in attempts to standardize XBRL. Drawing upon actor-network theory (ANT) we "follow the actors" participating in XBRL standardization efforts in Australia. Supporting qualitative empirical evidence was collected via interviews and reviews of XBRL technical documentation. By presenting unsuccessful and potentially successful focal actors side by side, we enhance current understanding of the role of focal actors in technology standardization networks. Specifically, focal actors require clear and indispensable value propositions and solid political and financial support to achieve effective translations in technology standardization networks.

Keywords

XBRL, actor-network theory (ANT), technology standardization, taxonomy standardization, Australia

INTRODUCTION

Conventional research assumes that rational technology design processes exist which represent linearly temporal sequences within orderly organizational contexts (Faraj et al. 2004). Moreover, complex technology research in general, and information systems (IS) research in particular have been criticized for conceptualizing IS artifacts as "relatively stable, discrete, independent and fixed" (Orlikowski and Iacono, 2001, p. 202). Recent IS artifacts have become increasingly ubiquitous, heterogeneous, and complex and result from continuous and complicated webs of interactions amongst different organizations (Garud and Rappa 1994). Channelled through networks that include software developers, user communities, and standard-setting bodies, these interactions can shape how and why complex IS artifacts are built, the social construction of their meaning, and the manner in which their properties evolve. Consequently, conventional approaches to IS research have become inadequate for studying complex IS artifacts (Lyytinen and King 2006; Orlikowski and Iacono 2001).

The standardization of complex IS artifacts represents "cooperative, multi-actor research and development" (Lyytinen and King, 2006, p. 405) and is vital for their successful development and subsequent management. Limited research exists that explains the underlying standard development processes including why and how standards emerge (Lee and Oh 2006; Lyytinen and King 2006; Yoo et al. 2005). To address this gap, we explore attempts at the standardization of eXtensible Business Reporting Language (XBRL) (Deshmukh 2004). XBRL enables the electronic communication of financial data. It aims to integrate information flow within communities of diverse organizations by standardizing the form in which data are exchanged. As participating organizations are likely to be different in terms of their internal systems, XBRL standardization decisions must be shared amongst them which may require complex interactions and negotiations. Although, XBRL is expected to address existing efficiency, accuracy, and transparency problems with financial reporting, limited research has explored its standardization, and the processes that shape it as an IS artifact (Debreceny 2007).

This paper explores the phenomena that occur when heterogeneous actors, such as firms, industry consortia, standard setters, software developers, and government, engage in complex interactions in XBRL standardization efforts. We illustrate this by using actor-network theory (ANT) to investigate XBRL standardization in Australia. ANT can provide detailed and precise descriptions of how networks of heterogeneous actors attempting XBRL standardization are built (Rodon et al. 2008). Specifically, by investigating unsuccessful and potentially

successful XBRL standardization networks, we attempt to address criticism on extant ANT accounts for providing limited insights concerning the roles played by actors in the complex collaboration dynamics of actor-networks (Lee and Oh 2006) and for focusing almost exclusively on "'heroes' (business leaders, successful organizations, major projects, etc.) to the exclusion of relevant 'others'" (McLean and Hassard, 2004, p. 501). Thus, the goal of this paper is to examine, identify, analyse and explain the processes of how various actors make alliances with other actors or compete against them and the extent to which they might succeed or fail to standardize XBRL in Australia. In pursuit of this goal, we use the process of translation, one of the basic ANT tenets, as a research framework and we hope to generate insights that enhance current understanding of why and how new technologies such as XBRL succeed or fail to become standardized. To achieve this goal, after explaining XBRL, we discuss ANT, the rationale for using it and its validity. Actor translation in XBRL standardization is analyzed before the paper is concluded.

XBRL

XBRL is a data formatting language that is used for the preparation and exchange of financial information among disparate computer platforms, and software applications. It does not replace existing accounting standards rather it enhances their usability. There are several different users of XBRL including, accounting firms, auditors, investment analysts, and regulatory authorities (Troshani and Doolin 2007). For XBRL to fulfil its potential as an effective communications medium, some users need to produce financial reports in XBRL, while others consume them in the same form. Producers and consumers are connected through information flow requirements. An XML derivative, XBRL takes advantage of the 'tag' notion which associates contextual information with data points in financial reports. When formatted with tags, financial reports are called XBRL instance documents. The tags themselves are based on accounting standards and regulatory reporting regimes and are defined in XBRL taxonomies which define data items, their relationships and processing rules (Deshmukh 2004). For example, the Standard Business Reporting Management Group (SBRMG), established by the Australian Federal Government, is standardizing an Australian taxonomy which enables reporting from businesses, i.e. the producers, to government agencies, i.e. the consumers.

Due to XBRL complexity, producing and consuming instance documents manually is practically impossible. Thus, the benefits of XBRL cannot be achieved without supporting software applications. These are developed by software developers/vendors and require a set of technical rules concerning how XBRL works. These rules are specified in the XBRL Specification which is central to the operation of XBRL (Turner 2005). Having reached a stable state of development, at version 2.1, the XBRL Specification is generally considered to be reliable by developers (Willis 2005). XBRL was developed under the auspices of XBRL International, a consortium that oversees the evolution of the XBRL Specification and coordinates the efforts of local consortia which cover local jurisdictions based on countries, regions or internationally recognized business reporting regimes (Doolin and Troshani 2004). For instance, the consortium of the Australian jurisdiction is XBRL Australia, and like other consortia, it has attempted to promote XBRL to organizations in its jurisdiction and to develop the local taxonomy. The diversity and complexity of various accounting standards and regulatory reporting regimes can be substantial. Therefore, "no single taxonomy can cover the world's diverse needs for financial reporting" (Deshmukh, 2004, p. 202). It follows that XBRL taxonomy standardization cannot be undertaken as a global initiative rather it is the responsibility of local jurisdictions. A current challenge is to standardize taxonomies for local jurisdictions. In this paper, we focus on the standardization of the Australian taxonomy which for simplicity is henceforth referred to as XBRL standardization.

ACTOR-NETWORK THEORY

ANT offers a framework for investigating how technical artifacts come into being (Allen 2004; Bijker et al. 1987; Latour 1999). It focuses on actors and their attempts to secure their interests by forming and strengthening alliances in actor-networks (Akrich 1992). Actors represent human or non-human entities that are able to make their presence individually felt by other actors (Law 1991). ANT provides a symmetrical treatment between the technical and the social aspects of technology, in that both human and non-human actors are treated alike. That is, technical artifacts are treated as genuine actors, in that, while not merely physical, technical artifacts constitute a dynamic embodiment of human actors' subjectivities, including their motives, intentions, interests and prejudices (Faraj et al. 2004).

There are two pivotal concepts underpinning ANT, namely, inscription and translation. Inscription means that actors that develop an artifact seek to embody or inscribe their interests into it. When inscribed, interests may be manifested as specific anticipations and restrictions concerning future usage patterns of the artifact (Hanseth and Monteiro 1997). The artifact, thus, becomes a genuine actor that has the ability to impose the inscribed interest onto other actors, i.e. the users of the artifact. Therefore, the technical aspects of artifacts, their roles and constitutions are profoundly social (Mähring et al. 2004). Translation constitutes a variety of negotiation

methods whereby different actors' interests are continually aligned to achieve a stable actor-network that is dedicated to constructing a technical artifact (Callon 1986a; Rodon et al. 2008). Translation comprises four stages: problematization, interessement, enrolment, and mobilization. During problematization one (or more) initiating actor(s), also known as a focal actor, defines a problem and how it affects its interests (Lee and Oh 2006). The focal actor also identifies other actors whose interests are consistent with its own and attempts to establish itself as an indispensable resource and an obligatory passage point for them to resolve the identified problem (Callon 1986b). Interessement consists of processes that attempt to "lock in" other actors as allies or supporters in the actor-network. During interessement, the focal actor attempts to convince others that the interests defined during problematization are aligned with its own. Successful interessement "confirms (more or less completely) the validity of the problematization and the alliances it implies" (Callon, 1986b, pp. 209-210).

During enrolment focal actors attempt to define and coordinate roles aiming to stabilize and strengthen the emerging network. It involves "multilateral negotiations, trials of strength and tricks that accompany the interessement and enable them [focal actor(s)] to succeed" (Callon, 1986b, p. 211). Successful enrolment in networks represents the alignment of the otherwise diverse interests of its actors which suggests that to maintain network stability actors must be willing to participate in specific ways of thinking and acting (Walsham 1997). During mobilization the focal actor employs methods for ensuring that allies operate in accordance with their agreement and do not betray its interests (Callon 1986b). Although temporarily, stability may be achieved in an actor-network when allies are mobilized at which point "the underlying ideas have become institutionalized and are no longer seen as controversial" (Mähring et al., 2004, p. 214). While using distinct translation stages facilitates theoretical discourse, analysis, and understanding, in practice, these stages can be interwoven (Mähring et al. 2004). Additionally, complete translation does not necessarily have to traverse all stages, it may, in fact, fail or stop at any stage (Callon 1986b).

Using ANT for investigating XBRL standardization can be advantageous for three main reasons. First, by focusing on actor-networks as the fundamental building blocks of technology standardization, ANT looks at the relationships between actors as complex social interactions comprising entrepreneurial and political activities and negotiations (Garud and Rappa 1994; Latour 1987). Therefore, ANT allows investigating such questions as how technology standards "come into being and how users and other actors conform, ignore, modify, or usurp the original designers' interests" (Faraj, 2004, p. 189). Second, ANT can help investigate complex actor interactions as they unfold which might otherwise be missed in post-standardization assessments (Hanseth et al. 2004; Latour 1987; Lee and Oh 2006; Walsham 1997). Third, ANT offers a rich language that allows technology standardization researchers "not to distinguish a priori between [the] social and technical" (p. 185), thereby encouraging "a detailed description of the concrete mechanisms at work which glue the network together – without being distracted by the means, technical or non-technical, of actually achieving this" (Hanseth and Monteiro, 1997, p. 185).

In this paper, we focus on translation which we employ as a framework for analysing and explaining the manner in which XBRL standardization is being carried out in Australia. We deem this to be appropriate for two reasons. First, technology-in-the-making involves "constant negotiation and renegotiation among and between groups shaping the technology" (Bijker, Hughes, and Pinch, 1987, p. 13). It is, thus, natural to focus on translation. Second, while translation aims at forming, strengthening, and maintaining networks of actor alliances, standardization is concerned with how actors and their goals are locked into patterns of interactions and in processes of continuous alignment of dynamic interests (Mähring et al. 2004). This suggests that there is a fit between actor translation and technology standardization (Lee and Oh 2006).

DATA COLLECTION

Latour (1999) describes ANT as a "very crude method to learn from the actors without imposing on them an a priori definition of their world building capacities" (p. 20). Given the evolving, uncertain and intricate nature of XBRL, its standardization can be better understood by examining the interpretations of actors as they interact and get tied together by mutual bonds of reciprocity in processes of constructing and maintaining XBRL standardization networks (Wagner et al. 2004). Qualitative empirical data were collected by interviewing human actors and reviewing supporting documentation including relevant publications, white papers, and other materials located at relevant websites. Following Wagner, Galliers and Scott (2004), information attributable to non-human actors (e.g. XBRL taxonomies) was obtained by interviewing spokespersons and reviewing relevant technical documentation. Interviews were conducted from April 2008 to January 2009. In all, 1087 minutes of interviews were recorded, transcribed, and analysed. To maintain anonymity, only the categories of the organisations of the interviewees have been identified in Table 1.

Table 1. Categories of organizations and number of interviewees

Organization category	Number of organizations	Number of interviewees

Large accounting firms	3	3
Software developers/vendors	6	7
Regulatory agencies/Offices of State Revenue (OSR)	6	9
Local XBRL consortium (XBRL Australia Ltd.)	1	4
Professional accounting bodies/industry associations	3	3
Standard Business Reporting Management Group (SBRMG)	1	4
Total	**20**	**30**

With ANT, one must closely "follow the actors" in order to understand how actor-network negotiations influence the form that technical artifacts will or will not take (Callon 1986a; Latour 1987; Law 1991). Thus, we used snowballing to identify actors (Aaker and Day 1990). That is, actors provided referrals to other actors who suggested yet others until actor-networks and their boundaries were roughly set though never completely identified. To decide "who to include and who to exclude" (McLean and Hassard, 2004, p. 499) we directed our investigative work at contextualizing XBRL standardization as the assemblage that we wished to chart (Miller 1996). That is, while following the actors, we stopped when the contextualizers (e.g. XBRL standardization negotiations, interactions, alliances) stopped. For instance, while following the actors, references to XBRL Specification 2.1 and its developers, XBRL International, "tend to melt from view" (Law, 1991, p. 11). As XBRL Specification 2.1 was generally considered to be reliable, it had become accepted and was no longer controversial (Mähring et al. 2004). Given the local taxonomy standardization focus of this investigation, the exclusion of actors such as XBRL International was, therefore, warranted. Focusing mainly human interpretations can provide a social bias of the technical. To minimise this risk, we followed Callon (1986b) who argues that "no point of view is privileged and no interpretation is censored" (p. 200). Thus, we followed all those involved in doing relevant XBRL standardization work, no matter how many and heterogeneous they were (Latour 1987). Specifically, our interviewees belong to different categories (Table 1) and, thus, provide different perspectives. In addition to providing triangulation of qualitative data, this also reduces the possibility of interpretations being locked into one mindset. Furthermore, data were collected from multiple sources. That is, while interviews constitute the primary source of information, technical artifacts (i.e. XBRL taxonomies) and additional supporting documents were also examined.

TRANSLATION IN XBRL STANDARDIZATION

In the following discussion technical actors are referred to by their names (e.g. XBRL). For simplicity and for maintaining anonymity, human actors are referred to by the category of the organization they represent. We found that multiple human actors belonging to the same organization have been translated to the same views and are, thus, collectively deemed to be a single actor. According to Hanseth and Monteiro (1997), this is justified as ANT "has a scalable notion of an actor" (p. 190) meaning that it "does not distinguish between a macro- and micro-actor because opening one (macro) black-box, there is always a new actor network" (p. 190). Both XBRL Australia and SBRMG have sought to become focal actors for XBRL standardization in Australia. They have both attempted to form their networks by translating actors in different ways, although their goals have been similar, that is, forming stable networks for standardizing XBRL.

Problematization

XBRL Australia Since its inception in 2001, XBRL Australia adopted a generic outlook in its problematization of existing financial reporting. The essence of its case was the lack of interchangeability and limited interactivity in the ways that financial data are reported. Whether on paper or digital formats (e.g. HTML, PDF, MS Excel), financial data can be read by humans, but cannot be easily used by applications to enable subsequent efficient and effective processing. Further processing requires extensive manual intervention, which can be time-consuming, labour-intensive, and error-prone. Additionally, opacity of financial reports, that is, their limited ability to facilitate auditing and corporate accountability, was also highlighted as a problem.

XBRL Australia proposed replacing existing financial reporting methods with XBRL as remedy in attempts to become its focal actor in Australia (Richards and Tower 2004). To fulfil this role, XBRL Australia set objectives for standardizing XBRL, establishing XBRL awareness, and developing educational materials. Together, participating in taxonomy standardisation by becoming member of the XBRL Australia network and paying membership fees were established as obligatory passage point. Having actors traverse this was important for both allowing enrolled actors to inscribe their interests into the XBRL standard, thereby achieving stability in the XBRL Australia network, and generating membership income which would be necessary for making XBRL Australia financially viable and capable of fulfilling its objectives.

SBRMG In response to increasing regulatory imposts on business, a comprehensive review of Australia's Federal Government compliance burden was initiated in 2005. It culminated with an extensive report that

identified "unnecessary burdensome, complex, [and] redundant" areas of government regulation (RegulationTaskforce 2006). The report findings provided a solid problematization basis for highlighting the excessive compliance burden that government reporting was imposing on business. In 2007, the Australian Federal Government formalized the Standard Business Reporting (SBR) program and appointed its Management Group (SBRMG) as the focal actor to set up the SBR network (SBR 2008). Free membership was established as an obligatory passage point. XBRL was selected as a technical solution for SBR as it was being adopted for the computerised sharing of financial data by many governments and accounting industries globally (O'Brien 2008; SBR 2008b). To legitimize its problematization and enhance SBR/XBRL understanding, to reiterate SBRMG legitimacy, and to recruit actors in its network, the SBR/XBRL Conference was also organized in 2007 (Treasury 2007a). SBR aims to provide government agencies with common sets of data definitions, thus, harmonising and rationalising inconsistent reporting items. It includes many government reporting forms[2] in its scope. Upon XBRL standardization, these forms will be automatically pre-populated with data stored in businesses' accounting software and sent electronically directly to relevant government agencies. This is expected to result in significant benefits including time and effort savings in report preparation, filing, error handling and save businesses approximately A$800 million annually (SBR 2008b).

XBRL Australia versus SBRMG XBRL Australia and SBRMG have both claimed the focal actor's position for standardizing XBRL. However, since its beginning the XBRL Australia claim remained weak and was weakened even further with the establishment of SBRMG. Clear strategic and domain focus as well as strong government backing have at least partially contributed to establishing SBRMG as the prevailing focal actor while simultaneously overshadowing the XBRL Australia claim to this position, thus, undermining its ability to create a network. Having taken a generic outlook on problematization, XBRL Australia is perceived to lack strategic and domain focus for XBRL standardization:

> *"But it does worry me that if they [XBRL Australia] continue not to have a business and strategic focus on the product [XBRL]. It means that it [XBRL] can meander all over the place." (SBRMG Interviewee)*

In contrast, SBRMG has positioned itself with a clear strategic focus on the government reporting domain and measurable benefits that XBRL standardization can provide for their purpose (SBR 2008; XBRLAustralia 2008).

Another drawback in XBRL Australia's approach concerns its excessive focus on the technical aspects of XBRL. The jargon used in presenting XBRL to potential actors may have polluted the rationale for enrolling in its network as XBRL Australia is "very technically oriented" (SBRMG Interviewee) and their problematization separated the technical from the social:

> *"There is just a big disconnect between what I call technology boffins and the accountants. The technology boffins are not doing this [XBRL standardization] with a view for application." (Large accounting firm Interviewee)*

Conversely, SBRMG has attempted to encapsulate the technical and the social in their problematization:

> *"[SBRMG] is looking at it [XBRL] from the point of view of the user." (Software developer/vendor Interviewee).*

Furthermore, aside from a small start-up government grant, XBRL Australia lacked sponsorship. As government is perceived to be a credible sponsor, interest in XBRL was stimulated and renewed when the Australian Federal Government announced its sponsorship of SBR and support for XBRL as its underlying technology. Additionally, the SBR program involves a sweeping range of government departments at federal and state levels which, together, are considered credible champions of both SBR and XBRL. SBRMG has systematically publicised government support to strengthen its claims for focal actor position for XBRL standardization.

Interessement

Lock-in to existing financial reporting methods can undermine effective participation in XBRL standardization. Actors need to be convinced that XBRL standardization will lead to more effective and efficient reporting relative to existing alternatives. Until XBRL Australia relinquished its claim for the focal actor position and after SBRMG prevailed in 2007, they have both attempted to make actors interested in their XBRL standardization networks amongst potential actors.

[2] Examples of these forms include Business Activity Statements submitted to the Australian Taxation Office (ATO), Quarterly Business Indicators Surveys submitted to the Australian Bureau of Statistics (ABS), Financial Statements submitted to the Australian Securities and Investment Commission (ASIC), and Payroll Tax statements submitted to Offices of State Revenues (OSRs).

XBRL Australia interessement With problematization weaknesses, XBRL Australia was ineffective in generating a compelling business case to achieve widespread interest for potential actors to become part of its network:

> *"When we have workshops it is still the same old people that have been coming since 2001 and not many new ones…" (Local XBRL consortium Interviewee)*

With paid membership, XBRL Australia network actors could access mailing lists and training materials in addition to the entitlement to inscribe their interests into the XBRL standard. Interviewees unanimously argue that this was a poor proposition to generate interest as it did not offer real business value. Moreover, actors that have become interested are not representative of the population of potential actors as "more of them are actually small companies rather than large companies" (Local XBRL consortium Interviewee), others are XBRL enthusiasts, and yet others have expressed ulterior motives for becoming members. For instance, some have become members only to have firsthand access to XBRL intelligence with hopes of gaining first-mover advantages in their industry. With motives of this nature, these actors are likely to be passive in the network and provide limited or no contribution in XBRL standardization. Additionally, after its creation XBRL Australia has only relied on limited membership income and volunteer work which has circumvented its ability to fund and run activities allowing it to become a focal actor and pursue its XBRL standardization objective (XBRLAustralia 2007).

We argue that efforts of XBRL Australia to translate actors in its network have failed at the interessement stage which is, at least partially, the outcome of ineffective problematization and lack of credibility for XBRL as its solution. Currently, XBRL Australia has relinquished its claim for focal actor position and has become an SBRMG supporter. This is unambiguously acknowledged in the XBRL Australia Business Plan 2008-2010 (XBRLAustralia 2007). In the SBRMG network, XBRL Australia is fulfilling supporting roles which include developing XBRL educational materials and promoting XBRL awareness (e.g. industry publications). Although unsuccessful on its quest to become focal actor, interviewees argue that XBRL Australia has been contributing to building XBRL awareness in Australia which has facilitated SBRMG efforts for generating interest in its SBR/XBRL solution. XBRL Australia members recognise the focal role of SBRMG in its XBRL standardization network and XBRL Australia's supporting roles within it.

SBRMG interessement Owing to underlying federal government drive for and sponsorship of SBR, government agencies and Offices of State Revenue have crossed the SBRMG obligatory passage point. Furthermore, because the SBR/XBRL solution aims at improving business reporting across government, these agencies have become interested in it. However, these actors represent the consumers of business information. Interest from producers is also required for the SBRMG network to become complete and stable. SBRMG has faced challenges in generating interest amongst some producers but has designed strategies for addressing them. The SBR program is driven by a strong business case, clear objectives, quantified benefits, and clearly defined standardization processes. This has facilitated XBRL standardization interessement amongst large accounting firms. However, interviewees, including those from professional accounting bodies/industry associations that represent Small and Medium Enterprises (SMEs), argue that motivating SMEs to participate in the SBRMG network, and subsequently, adopt both SBR/XBRL may be challenging:

> *"I just can't see people willing to invest, apart from big organizations. They probably will, because they would be able to look at the strategic level of some of this stuff …. But at a smaller organization level, I'm not sure that they're going to be motivated." (Professional accounting bodies/Industry associations Interviewee).*

This is substantiated further in industry publications:

> *"For small practitioners and entities that may only report to one or two of the relevant government agencies, the [SBR/XBRL] cost savings aren't quite as obvious." (O'Brien, 2008, p. 37).*

These interessement challenges may be influenced by at least two factors. First, existing compliance reporting for SMEs is relatively straightforward which has made XBRL standardization benefits hard to see. Typically, SMEs are required to make quarterly submissions of Business Activity Statements to the Australian Taxation Office. These submissions entail providing information concerning few data fields in paper-based forms. Second, standardization benefits are not expected to be immediate, rather accumulate overtime. This was confirmed unequivocally in all interviews:

> *"… there are benefits but they're not in year 1, they're in year 2 onwards. And people find it hard to see beyond year 1." (Professional accounting bodies/Industry associations Interviewee).*

To address interessement challenges, SBRMG has organised pilots, trials, and high level design testing with users from large, medium and small organisations. Interest for SBR/XBRL standardization as credible solution for the SBRMG problematization may, consequently, be emerging as evidenced in (SBR 2008h) and in interviews:

> *"… the accountants are starting to see the benefits." (Professional accounting bodies/Industry associations Interviewee).*

Although all interviewees unanimously agree that government should bear XBRL standardization costs, it is currently unclear if adopters will be required to absorb post-standardization adoption costs. These costs include purchase of or upgrade to XBRL-enabled accounting applications, data transfer and renewable digital certificates costs. While these costs may be absorbed easily by large well-resourced actors, they may be non-trivial for others including SMEs. Additionally, the current stance adopted by government is that SBR/XBRL will be an option amongst existing web- and paper-based reporting alternatives suggesting that SBR/XBRL adoption will be optional. Together, these may affect interessement amongst potential actors adversely.

Enrolment

All interviewees except those from SBRMG and government agencies unanimously argued that enrolment in the SBRMG network should be compulsory. Three reasons were provided. First, compulsion would shorten XBRL standardization timing by quickly enrolling diverse actors and aligning their efforts in the SBRMG network. Second, compulsion would reduce uncertainty associated XBRL as a new technology. Third, using successful examples from elsewhere in the world as a basis for arguing that XBRL standardization and subsequent adoption in the regulatory realm has occurred by compulsion, most interviewees concluded that the same should occur in Australia. However, interviewees from SBRMG and government agencies reject compulsion as enrolment means. Using consultation as a "reality check" to "stay in touch with the needs of Australian businesses", SBRMG is attempting to enrol actors in its network and achieve stability by aligning their XBRL standardization efforts (SBR 2008d; SBR 2008g). To facilitate consultation, SBRMG has created collaborative environments for enrolled actors to inscribe their interests by incorporating feedback into the emerging XBRL standard (SBR 2009). Actors review XBRL content and structure for compliance with their policy, regulatory, legal, conceptual, and technical frameworks. To date, actors have inscribed their interests incrementally in five versions of the XBRL standard either by introducing new business data definitions and information classification structures or by improving the adequacy of existing ones. XBRL Australia has supported this process by providing XBRL viewing tools and educational materials for actors that lack XBRL understanding (SBR 2009).

Mobilization

Software developers/vendors are considered to be strong mobilization candidates. Since XBRL was introduced in Australia, developers have exhibited strong interest which diminished before XBRL Australia relinquished its claims for the XBRL standardization focal actor role but has subsequently become restored after these claims were taken over by SBRMG. However, while some developers are providing XBRL-enabled prototypes using non-standard XBRL taxonomies, others expect XBRL to become standardized and user demand to materialise (ATO 2008) before developing applications commercially:

> *"It is important that from the vendors point of view that we do actually get some business. We've put all the investment in, here in Australia. We need to start seeing some benefits. Otherwise we have to run our skills down and focus in on other areas." (Software developer/vendor Interviewee).*

To mobilize software developers, SBRMG is conducting surveys, workshops and periodic focus groups to determine their needs (ATO 2008; SBR 2008f). At least partially, these strategies may have contributed to stimulate mobilization as several developers, including those that provide accounting software for prospective SBR/XBRL users, are signing up for SBR pilots. Aside from SBR/XBRL awareness promotion (e.g. websites, industry publications) undertaken by professional accounting bodies/industry associations actors and XBRL Australia no evidence has been found suggesting that further mobilization has occurred as yet in Australia. This aspect of translation remains, therefore, incomplete at this stage.

CONCLUSIONS

Using ANT, we have examined attempts at XBRL standardization in Australia. We conceptualise it as a process of creating stable relations amongst actors that are tied together by mutual bonds of reciprocity in networks. This conceptualisation helps improve current understanding of how and why new technologies succeed or fail to become standardized. We find that actor translation has stopped at the interessement stage in the efforts of

XBRL Australia to establish its network. Focal actor references to XBRL Australia start to "fade away, no longer making significant appearances" (Latour, 1999, p. 307) in the collected data. Conversely, translation has progressed under SBRMG auspices. References to SBRMG "continue to dominate" and have become "matter of fact – something so ingratiated within [the XBRL standardization] community… that its presence is indisputable and obvious" (Latour, 1999, p. 307).

In attempts to establish its network, XBRL Australia separated the technical from the social. In contrast, SBRMG provided a specific social setting, namely government SBR, for the technical, namely the XBRL standard, thereby encapsulating the two as "twin results" of network building efforts. SBRMG is attempting to strengthen and enlarge its network further by enrolling new actors in it and mobilizing existing ones. SBRMG translations are becoming increasingly permanent and tangible as actors inscribe their interests into incremental versions of the XBRL standard, thereby enhancing stability in the SBRMG network. Our ANT account highlights the critical role of focal actors in achieving effective translations in technology standardization networks. Focal actors require clear and indispensable value propositions and solid political and financial support. Furthermore, the manner in which they conceptualise problematization determines how interessement unfolds which can affect translation effectiveness and network stability. In presenting SBRMG and XBRL Australia side by side, we look at the fates of unsuccessful and potentially successful cases (Latour 1992), and thereby address criticism of ANT accounts for focusing on 'heroes' to the exclusion of relevant 'others' (McLean and Hassard 2004).

The main contribution of this paper is that, using ANT as a basis, we built a framework through which technology standardization occurs. Specifically, we learnt that by drawing on the four translation stages we can analyse and explain the process of XBRL standardization in the Australian setting (Lee and Oh 2006). This paper contributes by highlighting the value of ANT as a compelling method for illuminating the complex interests, the emergent causality, the reciprocalities and the social interaction processes through which technical artifacts such as XBRL can be standardized (Ramiller 2007; Smallman 2006). Using ANT in XBRL standardization, we learnt that ANT can generate "situationally rich[er]" (Smallman, 2006, p.776) accounts of technology standardization efforts relative to "tool-based" perspectives and diffusionist models that take technology as a given. (Orlikowski and Iacono 2001; Ramiller 2007). Another contribution is to fill a gap in existing research concerning how and why standards emerge and in the process improve current understanding of technology standardization (Faraj et al. 2004; Hanseth et al. 2004; Hanseth and Monteiro 1997; Lee and Oh 2006; Lyytinen and King 2006; Yoo et al. 2005). Organisations in an increasing number of industries seek to collaborate using technical artifacts in order to support their business relations. Standardization of these artifacts is, therefore, extremely important if collaboration efforts are to succeed (Rodon et al. 2008). Thus, there is a significant need for these organisations to understand how standardization processes unfold given the idiosyncrasies of the industries they belong to. By focusing on the standardization of XBRL in financial reporting this paper therefore contributes by adding to prior literature (Smallman 2006). Although, we call for further research that investigates XBRL standardization both in Australia and in other contexts, we believe that this paper contributes to the existing body of knowledge by improving current understanding of the role of focal actors in achieving effective translations in technology standardization networks.

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