Abstract
This paper examines the development of eXtensible Business Reporting Language (XBRL) standards. XBRL is expected to become the global data standard for financial statement information over the Internet. We follow the early phases of XBRL development for external financial reporting in the US. We detail the issues around gaining the momentum of change to develop the standard among a heterogeneous group of stakeholders. These stakeholders have to undergo an implicit institutional change themselves in order to develop and adopt the standard successfully. This paper contributes to the standardization literature by examining change dynamics among the actors developing the standard.

Keywords: information systems standards, XML, change processes, pace

Introduction
XBRL is an information technology data format (i.e. standard), based on eXtensible Markup Language (XML) that provides for the standardization of financial statements (e.g., balance sheets) over the Internet (Weber 2003). Our interest here is the development of XBRL. We report on a case study that sheds light on the complexity of successfully developing a standard that requires institutional changes within a heterogeneous group of stakeholders. We examine how different stakeholder groups became motivated to change and how they began to gain the capacity for change in order to develop the standard. We consider the stakeholders in the development process to be those firms that provide financial reporting services (e.g., accounting, auditing) as well as regulators such as the Securities Exchange Commission (SEC) and the Federal Depository Insurance Corporation (FDIC) along with software providers.

Compared to many other XML-based standards, XBRL has made significant progress (Gartner Research 2004). The Australia Prudential Regulation Authority (ARPA) was the location of the world’s first XBRL implementation, which took 14 months to complete from the decision to implement the standard to the first system rollout (Fahy et al. 2003). The banking regulator worked with the Reserve Bank of Australia (central bank) and the Australian Bureau of Statistics to modernize and reengineer the reporting process for 12,000 Australian super funds, insurers and banks so that they could submit just one set of figures to meet the needs of all three agencies. Since then, regulators around the world (e.g., UK, Japan, Netherlands, Denmark, Ireland, China and Germany) have plans to develop the necessary schemes and documents to allow the submission of regulatory reports using the standard (www.xbrl.org, Smith and O’Kelly 2005). The progress so far is of course no guarantee that XBRL will be fully accepted in the long run.

Yet, the developments are noteworthy because of the number of stakeholders and the complexity of the change necessary for the development of the standard in different regulatory jurisdictions. The XBRL development requires broad collaboration not just within, but also across the groups of stakeholders in the financial reporting supply chain.
Different autonomous regulatory agencies need to coordinate to remove barriers. Regulators must also closely collaborate with the XBRL standards organization to ensure that XBRL specification (software code) and regulations (law) work together rather than against each other. In addition, regulators must work closely with software vendors that operate in the regulatory reporting markets. Members of the supply chain – from regulators to large software vendors of financial management software, to financial publishers and various other information providers – must see XBRL as supporting their collective interests in the disclosure of financial information. This is no small task given the very different objectives, values and histories of these groups of organizations.

A number of articles point to the difficulties of eliciting participation of different stakeholder groups in information technology standardization processes (e.g., Graham et al. 2003; Kotinurmi et al. 2003; Markus et al. 2003; Wigand et al. 2005). Stakeholder representation is particularly a problem when a standard crosses as many different actors as XBRL does. Krechmer (2005) describes the inherent conflicts among standards creators, implementers and users. Under-representation results at least partly because some groups do not comprehend the payoff and are not motivated to contribute (Graham et al. 2003). Another challenge to participation is that in XBRL the scope of the standard is broad and the stakeholders are in constant influx due to the political and social turmoil within the field (McCausland 2003).

In this paper, we examine the dynamics of those developing the standard. We limit our inquiry to the US regulatory reporting that includes quarterly Call Reports submitted by depository institutions to regulators such as the Federal Depository Insurance Corporation (FDIC) and the Federal Reserve Board (FRB). This is because progress in the US is concentrated on the Call Report Modernization Project of the FDIC. The case of XBRL implementation sheds light on the challenges of facilitating collaboration and sustaining momentum when developing an information technology standard.

**XBRL AS A DISRUPTIVE INFORMATION TECHNOLOGY INNOVATION**

XBRL is a language for preparing business reports that contain financial statements (balance sheets, statements of cash flows). XBRL uses XML schema to describe the vocabulary for the reports. The vocabulary lists the elements and attributes and describes the valid content in a report. The XBL Schema with XBRL extensions is called XBRL taxonomy. There are two components in XBRL taxonomy document: (1) elements and (2) relationships between elements. XBRL taxonomy is able to capture metadata to enable validation of the reports (contains data about the internal controls and related information such as assessment of internal controls). For basic understanding of XBRL taxonomy documents, a reader is referred to: http://www.kpmg.com/xbrl/XBRL_Home.asp. XBRL supports internal accounting functions and transactions as well as external reporting, although the general ledger functions of XBRL are beyond the current scope of the paper. We will focus only on external financial reporting.

Even within the external financial reporting, XBRL development community includes many different actors – financial publishers, software vendors, auditors, professional accounting associations, technical standards groups and regulatory agencies. XBRL potentially produces disruptive innovation in system development processes, services and regulatory processes in the external financial reporting. Lyytinen and Rose (2003: 563) define ‘the disruptive IT innovation as a necessary but not sufficient architectural innovation originating in IT base that radically and pervasively impacts systems development processes and services.’ As we will discuss shortly, XBRL entails changes in the software development processes and financial services. In the case of XBRL, services support the administrative core of the organization such as accounting and influences business functions or core business processes of the organization. XBRL also affects processes within the regulated public sector (regulatory processes). Regulatory processes involve state and federal agencies (e.g., the Securities and Exchange Commission) as well as various oversight boards (Public Company Accounting Oversight Board) and professional associations (AICPA³). We cluster the stakeholders into four groups and discuss the impact of XBRL on each group.

**The standards organization**

The standards organization, XBRL International, is a not-for-profit consortium of approximately 300 members that develops and approves the XBRL specification (see the organization chart in Figure 1).⁴ The XBRL International Steering Committee (ISC) sets the technical, financial and operational strategy for XBRL development. Specific working groups, one on requirements and the other on specifications, are in charge of the development of the standard itself. XBRL International, like many technical standards organizations, is a business-led nonprofit organization whose committees are comprised of volunteers from its member organizations. Members include software companies such as Microsoft and UBMatrix, accounting organizations like KPMG and PricewaterhouseCoopers and financial institutions such as Bank of America. Both small and large organizations are involved. Although the XBRL standards organization is business-led, it includes regulators as members. The standards organization deals
with widely varying and conflicting interests among the different groups of organizations as well as disparate rules and regulations across various jurisdictions.

The software development organizations

XBRL requires that the preparers of financial documents change from document-centric to data-centric processes. Data-centric processes focus on generating the necessary business facts and leave the presentation decisions to the end user. This change entails a new cognitive frame for software developers that produce the applications to prepare the documents, and has implications for the competitive landscape of software vendors serving the financial reporting marketplace. On one hand, XBRL potentially results in software applications such as Call Report applications becoming less differentiated that have been the core, and perhaps the only, business of small vendors in the business reporting market place. On the other hand, standardization offers opportunities to develop new value-adding, highly user-customized financial information services. As, many niche software vendors might not have the necessary industry, accounting and financial competencies to offer such services, radical changes are also expected in the structure of the vendor community.

Financial services organizations

Traditionally, external financial reports have been either word processing or spreadsheet programs. The documents have used inconsistent formats and often contain inconsistent data, which makes it difficult and expensive to consolidate and validate financial information at the firm level. Additionally, this process often requires manual re-entry of data. XBRL standardizes business semantics, data definitions, and item descriptions, and thereby promotes the transparent communication of financial information. XBRL will increase the efficiency of financial statement preparation and ease the extraction of financial information for analysis and decision-making purposes (Hodge et al. 2004). XBRL brings opportunities for more timely information disclosure (Hodge et al. 2004). XBRL also presents an opportunity for financial service providers to broaden their service offerings and expand the potential audience for their information services by supplying data in an international, universally understood XML-based format.
Regulatory organizations

Regulatory organizations involve state and federal agencies (e.g., the SEC) as well as various oversight boards (PCAOB) and professional associations (AICPA). Currently, companies incur the costs of preparing different reports for different agencies, and then the agencies must re-enter much of the incoming data manually because their information systems are incompatible with those of the companies. XBRL implementation not only transforms how regulatory agencies operate, but also alters the relationships between regulatory agencies and other entities in the financial reporting supply chain. The regulators are no longer forced to re-enter information or expend resources on the problems that arise as a result of incompatibilities between their own information technology platforms and those of the businesses that fall within their jurisdiction. XBRL implementation may also speed up the implementation of harmonized international business reporting standards.

MANAGING CHANGE DYNAMICS

Any type of change is complex and challenging with many different and diverse stakeholders. All the different groups must be motivated as well as capable of embracing the change that the standard facilitates. Gaining the necessary participation in the development and implementation processes is particularly challenging in the financial reporting field for a number of reasons. First, the financial reporting field is a complex institutional field and institutional fields are unlikely candidates for major change (Scott 2001). An institutional field is a ‘set of organizations that, in the aggregate, constitute an area of institutional life; key suppliers, resource and product consumers, regulatory agencies, and other organizations that produce similar services or products’ (DiMaggio and Powell 1983: 148). In the case of XBRL, the institutional field is comprised of very different groups of organizations – software vendors, accounting organizations, regulators, financial services firms, investors – that have very different histories, expectations and values. The existing relationships, pressures and norms constrain institutional change (Meyer and Rowan 1977; Oliver 1992; Scott 1987).

Organizations are motivated by a search for legitimacy, not just by the goal of rent-seeking. The search for what is appropriate, proper and desirable can engender resistance or avoidance to new ways of operating. Second, the regulatory financial reporting field is also subject to many different state and federal regulations (Greenwood et al. 2002). Regulations legitimize relative power imbalances that can in turn discourage change (Frooman 1999). Third, the field has not historically embraced technological advances (Weber 2003). There is little understanding of what dynamics are necessary to legitimize technological change (Orlikowski and Barley 2001). The role of information technology in institutional change is a big unknown (Robey and Boudreau 1999).

Yet, although difficult, change is often most needed in an institutional field (Burke 2002). Greenwood and Hinings (1996) proposed a model that posits factors that affect the pace and nature of change processes in an institutionalized field. To keep momentum for change from becoming engulfed by the momentum for the status quo, they argue that change requires that powerful groups of organizations are dissatisfied with the way that their economics interests are currently being met (interest dissatisfaction). Often, declining performance, crises or other ‘pains’ act to trigger the dissatisfaction. Change also requires that an entity be convinced that the current ways of operating are economically and politically disadvantageous (power dependencies). The organizations must also be able to conceptualize a new template that ties the change to outcomes that are beneficial to its interests in both the short and long term (value commitment). The capacity for change requires that the organizations have: 1) sufficient understanding of the new conceptual destination; 2) the skills and competencies required to function in that new destination; and 3) the ability to manage the journey to that destination. Figure 2 summarizes the change model.

The four dotted circles inside the boxes in Figure 2 represent the key stakeholders of XBRL: regulators (government, accounting firms), standards organization (XBRL International), systems development organizations (vendors) and services (financial services firms). For example, in terms of interest dissatisfaction and power dependencies, the current manual, paper-intensive procedures and disparate systems that characterize the financial supply chain must not only be seen as inefficient and ineffective, but also as a major social and political liability for corporate management, regulators and investors. Entities may indicate Interest Dissatisfaction through communication activities such as newsletters, outreach symposia, workshops and discussion sessions. Publicly endorsing XBRL or recognizing XBRL’s benefits also conveys dissatisfaction with the current ways of operating. Value Commitment is characterized by an organization’s investment – such as funding a pilot project or forming a committee or working group – before fully committing to XBRL. Power Dependencies are characterized by collaborative activities, such as forming alliances, because these groups will need to work together in order to complete the project. Capacity for Action is characterized by formal XBRL adoption, releases of XBRL product offerings and taxonomy development. Note that the four circles are interconnected, indicating that each stakeholder group has an effect on the rest. These interdependencies make change ever more complex as well as potentially contentious.
RESEARCH APPROACH

We chose the Greenwood and Hinings (1996) model to guide our analysis of the case data. The case encompasses the key events from the initial development of the XBRL data standard to the current progress of FDIC’s Call Report Modernization Project that involves XBRL implementation in the US banking sector. Our analysis is at the macro level. Our data consist of observations, interviews and archival analysis (Table 1). The first author worked on an XBRL implementation project for two years (from 2001 to 2003) as an analyst. Both authors were involved in interviews conducted between Spring 2004 and Spring 2005. Interviewees included 27 key informants (Table 2), which were participants from the standards organizations, software vendors, regulators and financial services firms. The interviews were qualitatively coded following the change model in Figure 2. Since our focus was on developing XBRL, we did not interview those who had only interests in adopting the standard but not developing it (e.g., investors). During the time of our study, corporate management showed lacklustre interest in adopting the standard without a regulatory mandate. They showed even less interest in devoting resources to developing it. Interview questions are listed in Appendix A.

Our case analysis is based on a variety of sources. We browsed the XBRL International website for overall organization history and XBRL development milestones. We read progress reports published by XBRL International to develop a chronology of key events around the world (such as conferences, symposium, adoption news, taxonomy development progress, etc.). We also added events discussed in press releases, journals, whitepapers, interviews, the XBRL Liaison Report and internal newsletters. Finally, we searched XBRL discussion forums for additional significant events, including one restricted to those individuals involved in the development of XBRL and forums that were open to the public. The closed forum is limited to 156 subscribers and as of 03/01/2005 contained 6,234 messages. The weekly meeting minutes of different stakeholders are available online.

Table 1. Data sources

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Number of Interviewees</th>
<th>Average XBRL Involvement (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standards board members</td>
<td>3</td>
<td>5.0</td>
</tr>
<tr>
<td>Regulatory agency staff</td>
<td>10</td>
<td>3.2</td>
</tr>
<tr>
<td>Financial services firms</td>
<td>2</td>
<td>1.4</td>
</tr>
<tr>
<td>Software vendors</td>
<td>10</td>
<td>2.9</td>
</tr>
<tr>
<td>Other – Consultants</td>
<td>2</td>
<td>1.8</td>
</tr>
<tr>
<td>Total</td>
<td>27</td>
<td>2.8</td>
</tr>
</tbody>
</table>

Figure 2. Change in an institutionalized field
Source: adapted from Greenwood and Hinings (1996)
working groups as well as requirement documents and specification documents are archived in the forum.

As a way to validate our documentation of timeline and key events, we asked a number of key people whom we had interviewed earlier and who had played strategic roles in the development of XBRL to review the draft. We made some small changes as a result of their feedback.

Next we discuss and analyse the key events of the XBRL implementation in the US so far.

**TIMELINE OF KEY EVENTS**

XBRL started in 1998 when Charlie Hoffman, a CPA with the firm Knight Vale and Gregory in Tacoma, Washington, became troubled by the inefficient manual process of financial reporting. Hoffman developed a prototype of financial statements and audit schedules using XML. AICPA, which initially funded XBRL development and the standards group (XBRL International), was the first participant to get on board in 1998. In July 2000, the standards group, XBRL International, was established as a non-profit, volunteer-based organization with no full time paid staff and the four largest international accounting firms (The Big Four) joined. By February 2001, membership in XBRL International had grown to 85, and included regulators, corporations and software vendors. At the end of 2004, membership was 298. By 2004, there were more than 15 XBRL jurisdictions around the world. Hence, rather than push forces and pull forces working simultaneously, the different groups of organizations became involved at different times. Figure 3 illustrates the time of different events.

Of the regulators – the US Securities and Exchange Commission (SEC) and the Federal Deposit Insurance Corporation (FDIC) – were interested in XBRL development as early as 1999. FDIC joined XBRL US in 2001. Interested in using XML language to address its inefficient operations, the FDIC contracted with several consulting firms to explore the feasibility of an XBRL-based Call Report system. In June 2003, it announced that it would develop a new $39 million Call Report system. When the system is completed, approximately 9,000 banks operating in the US will submit quarterly financial status and performance data in XBRL.

In 2001, XBRL International actively established liaison relationships with the financial services industry (e.g., Morgan Stanley, Bank of America). Among software vendors, Microsoft had early on joined XBRL International. By August 2000, Bill Gates suggested that XML would be the next revolution on the Internet and announced the .net strategy, which includes XML tools in upcoming Microsoft products. Then in 2004, Microsoft released Office Tools for the XBRL Prototype, enabling Microsoft Office Word and Microsoft Office Excel users to create and analyse documents in the global XBRL format. UBMatrix was also an early vendor participant and was the only player who has been consistently focused on XBRL-only solutions. However, the majority of software vendors (including the Call Report vendors) did not become involved until much later (during 2002 and 2003). Many software functionality announcements have addressed the Enterprise Resource Planning space that
caters to global public corporations, but few public announcements have addressed migrating functionality downward to software offerings for small and mid-sized businesses.

ANALYSIS AND DISCUSSION

The Greenwood and Hinings model (1996) laid the foundation for understanding the elements necessary for change in an institutionalized field. These elements are interest dissatisfaction, value commitments, power dependencies and capacity for action. These elements appear to be necessary (we cannot make any statements about sufficiency) for the participation of different stakeholder groups in the development and implementation of standards. The different stakeholder groups have varied widely in terms of the timing of their involvement. The complexity inherent in the four factors of the Greenwood and Hinings model (1996) help illustrate why the differences in timing of participation have occurred.

Uneven interest dissatisfaction

XBRL grew out of the dissatisfaction that one accountant had for the inefficient financial reporting processes that burdened corporate management and complicated auditing and other financial assurance services. The founding members of XBRL International shared similar dissatisfaction with regulatory process inefficiencies, data non-reusability and transparency. XBRL provides an alternative, more efficient template to comply with financial reporting requirements and offered financial analysts and investors a ‘search-facilitating technology [to] improve the transparency of financial reporting’ (Hodge et al. 2004: 687).

However, as time progressed and additional groups of organizations began to embrace XBRL, some groups felt that the benefits were indirect or distant. For instance, some software vendors did not see any immediate new sources of revenue or cost savings to counteract their resource investments in XBRL. Open source-based software standards also blurred the proprietary lines of their products and introduced fears of commoditization. There were deep divisions among software vendors in terms of the impact of XBRL on their competitive advantage; while some saw future new lines of services in financial reporting, others were concerned about protecting their proprietary technology. In the current FDIC project, the software vendors frequently see each other more as competitors instead of collaborators. The competitive atmosphere has slowed down the information exchange between the vendors and the regulator. These types of conflicts can undermine efforts to create a more tightly linked institutional field. One interviewee noted, ‘There is some cooperation, but we do most everything alone. During a conference call with the FDIC, we have to be very careful about what we say because we don’t want our competitors to know where we are in the process. The competitive atmosphere has also limited opportunities for joint training and education as well as collaboratively investing in new development processes and tools’ (personal interview 14 May 2004).

Similarly, corporate management saw little relief in XBRL to meet the urgent need to comply with the new accounting regulations mandated in the Sarbanes-Oxley Act. Moreover, they have been swamped with issues surrounding disclosure practices that diverted attention away from XBRL or initiatives not directly linked to establishing investor trust. Although, corporate managers, along with software vendors, agree that in the long run XBRL should reduce the costs of compliance with reporting regulations and data quality assurance services (e.g., audits), they were also concerned that reporting costs were likely to increase initially due to start-up and training issues with the new technology. Management was also worried that with the regulatory expectations for the quality and quantity of reporting, the new technology may, in fact, increase these expectations and therefore increase the costs of producing more and better information. Hence, a critical stakeholder, corporate management at large (with some exceptions), has still not embraced the technology.

Lack of a clear problem

Although Hoffman designed XBRL with a clear sense of the problem, XBRL International seemed to rally around a sensed opportunity and a grand idea rather than a specific problem. The lack of a specific problem focus made it difficult for many software vendors to influence and support this effort until FDIC formally committed to it with the Call Report project. The lack of a problem focus may have slowed commitments from corporate management as well, particularly when other prolonged initiatives like Sarbanes-Oxley drew attention away. One interviewee commented, ‘Most developers and users have smaller problems or more constrained problems, so some features of XBRL look like overkill from that perspective.’

It should be noted that in 2001 and 2002 XBRL International worked successfully to involve corporate management in demonstrating the viability of XBRL. Importantly, these corporations were central actors and hence could have provided compelling justification in terms of results. However, the pilots were communicated more as proofs of technical concept rather than as solutions to urgent problems that had positive impact on the operations of the organization. Also, following the
pilots, there were few timed announcements and updates demonstrating sustained gains.

**Shifting power dependencies**

XBRL implementation has been affected by power shifts among different groups of organizations that have occurred largely because of accounting scandals and their aftermath rather than because of, or in support of, XBRL. These shifts have reduced the power of actors that were strong early supporters of XBRL, particularly the AICPA and the large accounting firms.

In the US financial system, the SEC is looked upon as having high status and power because of its ability to enact and enforce new regulations, yet it has not made an official commitment to XBRL implementation. One interviewee commented, ‘The SEC is busy now with all the scandals. It is faced with many things at this time and XBRL is not required now. In the US, XBRL adoption has to compete with other things such as the Sarbanes-Oxley enforcements’ (personal interview 23 April 2004). Another remarked, ‘It needs to be driven by the SEC’ (personal interview 28 May 2004). Of the regulators, FDIC is the only one who has made a formal commitment to XBRL. Even the power of this commitment is diffused, as different regulatory agencies own parts of the process (FRB, FDIC and Office of the Comptroller of the Currency). Additionally, there is no central institutional authority that coordinates across agencies to ensure that barriers are removed so that banks can submit one set of numbers for different regulators.

One FDIC representative commented on the initiative: ‘It is rather unusual for a federal agency to make such a decision since federal agencies are supposed to be neutral towards any new technology until it is mature. FDIC really had an agenda in mind in pushing XBRL forward, mainly because it knows what its problem is, and XBRL seems to be the best solution that would be most beneficial to FDIC’ (personal interview 14 April 2004).

Large international accounting firms have also traditionally held a lot of high institutional power. The firms’ power has been tied to their credibility, their client base and their role as agents of change in the industry. Recent scandals have reduced public confidence in the firms. What’s more, the accounting firms’ role as agents of technology-based change was affected by the accounting regulatory changes that stripped them of their consulting businesses. All these changes help to explain why, over time, several large accounting firms, and particularly the accountants in those firms, have not taken an active role in driving the developments of XBRL. Small accounting firms are not prone to having a vested interest in technology-based change. Again, while there has been involvement from some accounting firms, participation by this group has not been widespread.

Why some particular firms versus other firms participated appeared to have more to do with the leadership and the other strategic ongoing initiatives rather than XBRL specifically.

The professional accounting association, AICPA, derives its power from its membership, particularly the large accounting firms. Some of its power also comes from its rule-making privileges, although this is limited by the lack of enforcement power. Enforcement of public accounting principles is highly decentralized in the US, resulting in highly disparate principles in different states. AICPA’s strength is in its educational programmes and marketing/lobbying efforts on the behalf of the accounting industry. The Big Four and AICPA are seen to operate in close concert; however, their interests have recently begun to diverge because of changes within the Big Four, which has adversely affected the power of the AICPA. These changes have further affected the standards groups operations.

The board newly created to enforce Sarbanes-Oxley, PCAOB, has both rule-making and enforcement power. At this point, the board has no official stand on XBRL. Also, it is too early to tell how PCAOB will affect the power and status of groups of organizations in the implementation of XBRL. This will depend largely on its ability to concentrate power and enable change. One interviewee remarked, ‘We have been trying to get cooperation from the accounting standards setting board, but have so far been unsuccessful. They do not have resources to support XBRL. But the accounting standards setting board is comprised of so many “leaders” from different organizations (business, academia, etc.), and have “traditional ways” of doing things, so it takes time.’

Finally, the composition of the XBRL International Steering Committee has shifted over time away from accountants and toward technologists. The initial steering committee in August 1999 consisted of 13 member companies, primarily the large international accounting firms. The membership has grown to approximately 300, with 50% of the members being software vendors, 10% to 15% government regulators and about 10% CPA organizations. As the XBRL International community has become increasingly technically oriented, so has its focus. This shift in focus has created a potential conflict between software and regulation, where technology is progressing ahead of regulatory development. When technology leaps too far ahead of regulatory development, it ultimately slows down the process because misalignments that later appear will lead to reversals of decisions and commitments.

In terms of corporate management, the ongoing power struggle between publicly held companies and their investors has probably also had an effect on the pace of XBRL implementation. Investors (especially institutional investors) are demanding greater amounts of timely, high-quality information from businesses, and
some argue that businesses should report continuously on their operations. XBRL facilitates such reporting by enabling capture, integration, processing and reporting of disparate information in common formats. Nonetheless, many businesses are reluctant to report on a continuous basis. Managers argue that they must be able to control the nature and timing of reporting, at least to some extent. Otherwise, competitors may acquire important information that will negatively impact their businesses. Investors also may make inappropriate decisions because they lack full knowledge of the context in which the businesses are operating.

**Limited capacity for change**

For implementation of standards to actually take place simultaneously, the entities must have the necessary skills and resources, or capacity, for change. The lack of a problem focus and the small community of experts involved in the base technology weaken this capacity for change. Few entities in the financial reporting supply chain appear to grasp the long-term conceptual destination of XBRL. Without the ability to theorize about the change, the firms have a difficult time developing the resources and capabilities. Corporate management faces much uncertainty in managing investor/analyst expectations under a near real-time reporting environment. They want to manage their risks and proceed cautiously. Software vendors lack the in-house experts in XBRL as well as the development tools to build XBRL applications. They might also lack the skill set for new services. It was only recently that the XBRL-DEV Online Forum was launched so that developers can share technical expertise and expand the knowledge base of existing and new developers.

Much of the limited capacity for change arises from the emergent nature of XBRL standards development and implementation. Emergent work processes share three characteristics (Desouza and Hensgen 2002; Markus et al. 2002). First, in emergent knowledge processes, problem interpretations, deliberations and actions unfold unpredictably. Second, the various stakeholders are unsure of their roles. There is uncertainty in terms of when and why the process is performed, who’s involved and what practices should be deployed. Requirements tend to change over time as the context and roles change. Finally, knowledge is distributed among many different people who are brought together in local design activities, involving significant tacit knowledge that is difficult to share.

The XBRL specification development has not proceeded predictably or linearly. Rather, the standard development itself has gone through iterations of change, between problem finding and solution evaluation. For instance, in December 2001, an attribute was added to the XBRL specification to signal whether or not a complete set of data was included. This attribute was removed in the next version V 2.1 released in December 2003. When the attribute in question was first designed, it was only to define facts within one single document (e.g., Balance Sheet), but as the technology evolved, it became possible to link multiple documents (e.g., Balance Sheet and Cash Flow Statement). Therefore, the problem of data inconsistency across multiple documents arose and the initial solution was no longer adequate. As one member said, ‘Our understanding of what the attribute can convey seems to be evolving away from informing instance users about what calculation links can be processed (because they can determine that for themselves without the attribute) toward something more akin to a “DRAFT” watermark on the instance.’

**MAINTAINING MOMENTUM THROUGH FOSTERING TIGHTLY LINKED COLLABORATION**

The purpose of this paper is to present a case study on the initial phases of developing and implementing XBRL in the US financial reporting sector. Many have noted the challenge of aligning the interests and business practices of a large number of different stakeholders in standards development and implementation and the resulting slow progress (e.g., Kotinurmi et al. 2003). Here we describe the dynamics of some of these challenges.

First, an institutional change is often about changing the nature of the field. What has been a highly fragmented institutional field has to become tightly linked and interlocked. Changes in one part of the field (accounting standards) must now flow through the other parts of the financial reporting system (software vendors, corporate management, financial services) much faster than before. For example, once FIDC implements XBRL, banks and their software vendors can take advantage of new technologies (e.g., rule based processing) and possibly redesign their development approaches to allow faster cycle times. However, technology by itself cannot accomplish these major changes in the relationships. Policy and organization changes must co-evolve with technology changes.

Second, collaboration needs to cut vertically and horizontally in the financial reporting value chain. As one software vendor put it, ‘Whilst [other technology] standards like DOC, RTF, MP3 could have been set and put into practice by one software producer mainly, XBRL’s development and adoption needs a cooperation of both producers and consumers.’ Regulators must closely collaborate with the XBRL standards organization to ensure that XBRL specification (software code) and regulations (law) work together rather than against each other (Lessig 1999). In addition, regulators must work closely with software vendors that operate in
the regulatory reporting markets. The corporate management and financial institutions must invest in their internal systems to make them XBRL compatible. There must also be increased cooperation and coordination within each of the groups of stakeholders. Before corporate management can submit one set of numbers, different autonomous regulatory agencies need to harmonize their requirements. Such cooperation will emerge slowly and be contentious at times because of the different expectations and interests of the groups.

Third, collaboration requires commitment for the change. The different stakeholder groups – from corporate management to large software vendors such as SAP and Oracle, to financial publishers and analysts, to investors and various information providers – became involved in XBRL at different times. Although the membership in XBRL International may be representative of all the different stakeholder organizations, it is often the case that an individual himself, rather than the stakeholder organization that he represents, is truly committed to change. Early on, these individuals have to convince their respective organizations that the change is in their best interest. Later, the change may occur because entities see that the new way of operating as legitimate. Commitment, particularly early on, rests on the organization’s understanding of the alternative template of operations and how the XBRL standard yields benefits to its interests. This commitment needs to be amplified by external pressures. Such pressure might come in the form of regulatory mandates, publicity from other countries’ developments and well-articulated expectations of change from strong and visible leaders who are well positioned within the financial reporting system. When the internal and external forces are aligned, the commitment and the prospects of sustained change are strengthened.

Fourth, the turmoil in the structure of the institutional field can undermine change. XBRL has faced changes in the mediating organizations. Damsgaard and Lyytinen (2001) discuss the critical role of trade organizations in the implementation of EDI standards. Attewel (1992) notes that when knowledge about the technology is limited and complex, mediating organizations play a critical role in development and implementation. With XBRL, AICPA has been a highly active member and has played a key role. However, other events unrelated to XBRL have eroded the power of AICPA. Power relationships can rapidly change as a result of unrelated events, particularly those that weaken the groups most dissatisfied with the current ways of operating. When that happens, it takes time to bring other powerful groups into the change process. XBRL potentially ‘gives’ power to financial intermediaries and investors and hence it is important that those groups of organizations participate in the unified front to promote XBRL. Positive relationships need to be actively developed among these groups, regulators, auditors and standards organizations.

It should be noted that the above analysis and initial inferences are limited in many ways. Our focus was external regulatory reporting in the US. We did not examine the effects of XBRL on internal accounting activities. Those activities are also likely to be transformed as XBRL development and acceptance progresses. Our study also suffers from the idiosyncrasies of a particular national context. Our analysis is not deep enough to make any substantive changes to the Greenwood and Hinings framework. Finally, because the implementation is still in progress, we cannot provide a full story or make any assessments of the potential for long-term success.

Looking forward to the future, there are ample research opportunities to examine institutional change processes in the context of information technology standards development and implementation. Many architectural and process standards require agreement on issues that come with built-in tensions and collaborations between competitors in institutional fields that are politically and socially fragmented. The Greenwood and Hinings (1996) model is a robust starting point for examining change in an institutional field. It can be extended, for example, by examining the recursive nature of the effects over time. While XBRL implementation has achieved major milestones, the progress has been at times painstaking. The change process has not been linear nor sequential. Will the current pace and recursive nature of the change lead to a disruptive IT transformation in the external financial reporting field?

We also encourage research on issues that we did not cover. The notion of the individual investor (end user) has not been so far very salient in the XBRL development and implementation. Future research should examine the value proposition from the end-user perspective. We also recommend expanding the scope to include the internal accounting activities as well as privately held firms. The private firms are not required to file financial reports to their investors and regulators. Yet, they can use XBRL’s general ledger functionality for their internal accounting books and transactions.

We have also not examined the industry restructuring, particularly among the software vendors. One interesting question is how newcomers might use standards to challenge the existing incumbents and the potential implications to market dynamics? So far, the new players are niche software vendors and none of the new comers have received enough traction to have a dominant role in the development and implementation of XBRL. But, we do see the new players consolidating and gaining greater client base and efficiencies as well as being acquired by the dominant vendors (Microsoft has acquired NetVision and NBS-FRX).

We also note the possibility of using other alternative theoretical frameworks. Reviewers to this paper noted
that the actor-network theory (e.g., Callon 1986, 1991) might shed new understanding to the dynamics of actors in standards development and implementation.

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Notes

1. XML is the eXtensible Markup Language. XML is now viewed as the standard information exchange system in environments that do not share common platforms [www.xml.org/xml/aboutxml.shtml]. It is designed to improve the functionality of the Web by providing more flexible and adaptable information identification. XML is actually a ‘metallanguage’ – a language for describing other languages – which lets you design your own customized markup languages for limitless different types of documents [www.ucc.ie/xml/#acro].

2. Financial publishers are information providers whose value-added services consist of aggregating, archiving, structuring and providing secure and reliable access to business information that has been brought together from many heterogeneous sources, to be presented to financial markets and other users.

3. American Institute of Certified Public Accountants (AICPA), a professional organization for certified public accountants in the US


6. The complexity of financial systems forces us to categorize organizations and describe events in such a way that much of the richness is lost. Hence, they can be criticized as overly simplistic or naïve. Nevertheless, we find it necessary to render the process manageable.

7. The SEC provides regulatory oversight for all public companies and the FDIC supervises almost 5,000 FDIC-insured state-chartered banks that are not members of the Federal Reserve System.

8. Federal Reserve Bank (FRB) publishes the Micro Data Reference Manual (MDRM), which includes a description of each Call Report data element and historical definition. The FDIC publishes an edited copy of each institution’s Call Report on the Web on a quarterly basis. Once Call Reports are prepared by banks, they are submitted to one central collection agent – EDS (Electronic Data Services). EDS ensures that the data is in a consistent format acceptable to the FRB bulk data transfer requirements, and it verifies receipt of the report to the submitting bank. Data is then sent to the FRB, which, in turn, sends a copy to the FDIC to begin the data quality validation process. When each agency receives the data, it is validated using that agency’s proprietary structures and processes.

References


XBRL.Org [accessed on 15 July 2005].
Appendix A. Interview Script

I. Questions pertaining to overall XBRL adoption

1. What is your background related to XBRL?
2. From your perspective, what is the value (benefits) of XBRL to your organization?
3. How will various stakeholders make a business case for XBRL? How can those benefits be quantified?
4. What are the key two to three recent developments that are accelerating the adoption of XBRL?
5. What are the key barriers to the adoption of XBRL at your organization?
6. What do you think of the technical complexity of XBRL?
7. Has technical complexity changed overtime?
8. Will XBRL require new competencies or organizational changes from your organization?
9. How will XBRL change the relationships between various entities on the supply chain, if any?
10. How will XBRL affect your organization’s underlying business processes, if any?
11. Has there been a lot of collaboration between various stakeholders?
12. Are any of the organizations considering adopting XBRL?
13. Why is international adoption faster than the US?
14. How is the adoption approach in your home country different from other regions of the world?
15. What does it take to achieve wide adoption in the US?
16. There is leadership by regulators to adopt XBRL abroad to adopt XBRL. How critical are mandates to adoption?
17. Is the Sarbanes-Oxley Act making adoption of XBRL slower or easier?
18. What pace do you see the adoption of XBRL going forward and why?
19. Are there new challenges in the future?
20. Will the use of XBRL at your organization lead to new risks (such as security risk)?
21. Who is pushing or leading the adoption?
22. Who else do you recommend us to speak with?

II. Questions pertaining to FDIC Call Report Modernization project

1. What is the XBRL project progress up to date?
2. What types of banks are currently using your Call Report software? How many banks?
3. Has there been any client shift due to FDIC's XBRL requirement?
4. Has XBRL affected your firm's other lines of products or services?
5. What would be the shakeup of the Call Report software industry in large?
6. Has XBRL created any additional business opportunities for your firm?
7. What are some of the project challenges? Has XBRL been a smooth transition?
8. Did you make changes to your existing development processes for this project?
9. With the complexity of XBRL, has there been collaboration among software vendors?
10. What happens after FDIC integration? How will the technology trickle down?