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Drivers and Inhibitors Impacting Technology Adoption: A Qualitative Investigation into the Australian Experience with XBRL

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Abstract

eXtensible Business Reporting Language (XBRL) is an XML-based innovation which has the potential to play an important role in the production and consumption of financial information. In this paper, in-depth interviews are used to explore a range of issues surrounding the adoption of XBRL in Australia. Drivers that promote successful adoption of XBRL are discussed, together with inhibitors that obstruct it. We find that the current members of the XBRL community are waiting for a critical mass of either users or solutions to appear. Combined with other inhibitors and unfulfilled drivers, this has adversely affected XBRL adoption in Australia. While government agencies may play a significant role in breaking this deadlock through making XBRL use mandatory, we identify some important implications associated with this strategy.

1.   Introduction

This paper is concerned with the adoption of a technological innovation. Adoption occurs when an organization invests in and uses an innovation. This adoption occurs in two stages. Primary adoption constitutes the organization-level decision to adopt an innovation, while secondary adoption involves adoption of the innovation by individual users in the organization (Zaltman et al., 1973, Russell and Hoag, 2004). Organizational and individual adopters are, therefore, two separate concepts. The focus of this paper is

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on primary or organizational adoption. We use the term 'innovation adopter' to signify adopting organizations. However, before an innovation can be adopted, it has to be supplied by an 'innovation supplier'.

The innovation considered in this paper is the eXtensible Business Reporting Language (XBRL). XBRL facilitates and improves intra- and inter-organizational information supply chains, potentially enhancing e-business collaboration and integration. In this paper, we examine the adoption of XBRL in the Australian context. We identify and analyse the drivers and the inhibitors that Australian organizations are facing when adopting XBRL. We accomplish this by exploring the perceptions of a range of XBRL stakeholders in the Australian context.

This study is important for several reasons. XBRL is unique as an innovation (Bergeron, 2003) which suggests that findings of other similar studies may not be readily applicable to its adoption. As Wolfe (1994) argues, "the determinants of the adoption of innovations differ as the characteristics of the innovations differ." (p. 415). Published work on XBRL has mainly focused on the expected benefits of using XBRL and the technical mechanisms by way of which XBRL works (Doolin and Troshani, 2004, Bergeron, 2003, DiPiazza and Eccles, 2002, Boyd, 2004b, Deshmukh, 2004, Jones and Willis, 2003, Abdolmohammadi et al., 2002). Negligible research has been conducted on the factors that facilitate and inhibit XBRL adoption, either in general or in Australia in particular.

A deeper understanding of what encourages and constrains XBRL adoption is important because it has policy implications which help regulatory authorities and innovation suppliers formulate effective strategies to facilitate XBRL adoption. In addition, this understanding can help identify critical success factors which can then be incorporated into adoption programs, and therefore, enhance their effectiveness (Wolfe, 1994). Further, awareness concerning adoption drivers and inhibitors is likely to influence the attitudes of decision makers towards XBRL adoption. Current research suggests that these constitute a strong driver for adoption (Fillis et al., 2004, Au and Enderwick, 2000).

This paper is divided into seven main sections. The next section provides an overview of XBRL, its benefits, its stakeholders as well as some working definitions. The literature on drivers and inhibitors of innovation adoption is examined in the third section. We then discuss the method used and some validity issues. In the two sections that follow, the results of the study are presented and then discussed. We conclude with some general recommendations concerning the adoption of XBRL in Australia.

2.   The XBRL Innovation: An Overview

XBRL is an Internet-based non-proprietary open standard which is used for the preparation, exchange and publishing of financial information among disparate computer platforms, software applications, and accounting standards (Hannon, 2003, Hasegawa et al., 2003, Jones and Willis, 2003, Willis et al., 2003). XBRL eliminates time-consuming, labor-intensive and error-prone practices which are currently used for generating and exchanging financial reports (DiPiazza and Eccles, 2002). In addition, XBRL facilitates continuous auditing, thereby maximizing the transparency with which financial information is reported while also facilitating the enforcement of corporate accountability legislation (Rezaee et al., 2001, Roohani, 2003). In general, with XBRL, the efficiency of the entire information supply chain is considerably enhanced (Boyd, 2004a, Boyd, 2004b).

XBRL is a derivative of XML[1] (eXtensible Markup Language) and as such it takes advantage of the 'tag' notion which associates contextual information with data points in financial statements. When formatted with tags, financial statements are called XBRL instance documents. The tags themselves are based on accounting standards and regulatory reporting regimes and are defined in XBRL taxonomies (Pinsker, 2003, Richards and Tibbits, 2002). These are developed for specific countries, accounting jurisdictions, and even specific organizations (Deshmukh, 2004, Wallace, 2001). Sometimes, multiple instance documents produced using different taxonomies need to be processed by the same software tool. Capabilities of this nature are enabled by the XBRL specification, which constitutes the technology platform determining how XBRL works. This specification is central to the operation of XBRL (Willis et al., 2003).

XBRL was developed under the auspices of the XBRL International, a consortium which oversees the evolution of the XBRL specification and coordinates the efforts of the local consortia. The latter cover local jurisdictions based on countries, regions or internationally recognized business reporting regimes (Doolin and Troshani, 2004). The aim of the local consortia includes the promotion of XBRL to organizations in their respective jurisdictions and the development of local taxonomies. The local consortium for Australia is XBRL Australia Ltd.

XBRL is very complex, and producing instance documents manually is a practical impossibility. Consequently, the benefits of XBRL cannot be delivered without automated software tools. These are developed by software developers and distributed by vendors. Taken together, XBRL International, the local consortia, and software developers and vendors are, therefore, the suppliers of the XBRL innovation.

With XBRL, there are several different potential innovation adopters. These include individual organizations, accounting firms, investors and analysts, stock exchanges and regulatory authorities (Bergeron, 2003, DiPiazza and Eccles, 2002). These adopters are different in the way they deal with financial reports, and therefore, in the way they benefit from XBRL. Generally, some of these adopters produce financial reports, while others consume them. Producers and consumers are, therefore, connected through information flow requirements. For instance, in Australia, individual organizations are required by law to submit financial reports regularly to regulatory government authorities, such as the Australian Stock Exchange, a consumer. This suggests that, generally, adopters require two types of automated software tools: tools which produce instance documents, and tools which consume them with the aim of carrying out further processing and analysis. Combined together, suppliers and adopters of XBRL constitute its community (Markus, 1987, Markus, 1990).

Issues such as coordinating the efforts of the local consortia, motivating first movers, and managing XBRL complexity are expected to be challenges when implementing XBRL. These factors are associated with the innovation environment, the nature of the adopting organization, and the technology upon which the XBRL innovation is based. We now briefly review the vast literature on innovation adoption with respect to these three aspects.

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1 XML has been widely adopted in various areas including conventional and web publishing, data interchange and accessibility Kay, M. H., (2003): XML five years on: a review of the achievements so far and the challenges ahead, 2003 ACM Symposium on Document Engineering, Grenoble, France, ACM Press: New York..

3. Literature Examination

Innovation adoption is a mixture of push and pull influences (Warren, 2004). Further, Wolfe (1994) argues that innovation adoption is complex and context-sensitive. Environmental and organizational context factors as well as technology or innovation related ones play a significant role (Wolfe, 1994, Elliot, 2002, Al-Qirim, 2003). According to Tornatzky and Fleischer (1990), the environmental context constitutes the arena in which adopting organizations conduct their business, and includes the industry, competitors, regulations, and relationships with government. The organizational context includes characteristics such as quality and availability of human resources, availability of financial resources, and managerial structures. Technological or innovation related factors focus on how characteristics of the technology itself influence adoption (Tornatzky and Fleischer, 1990). Some of the most important involve the perceived benefits and costs of adoption, and the difficulty of integrating the innovation into the exiting organization. Table 1 summarizes some of the factors which were expected to be relevant to the adoption of XBRL in Australia.

Environmental Context Factors	Organizational Context Factors	Innovation Factors
External pressures	Human capital and employee education	Perceived relative advantage and benefits
Culture	Management attitudes	Perceived costs
Legal issues	Resources	Compatibility and complexity
Government		Observability and trialability
Industry associations		
Successful adoptions		

Table 1: Summary of environmental, organizational and innovation factors

3.1 Environmental Context Factors

The literature on innovation adoption has identified several environmental factors which can influence adoption decisions. According to Tidd et al. (2001) critical factors for successful innovation adoption include the ability of organizations to predict and respond to market and industry changes, while sometimes external pressures, such as competition, globalization, and new customer value propositions, may also favor innovation adoption (Cragg et al., 2001, Kalakota and Robinson, 2001).

Using the case of Internet banking adoption among corporate customers in Thailand, Rotchanakitumnuai & Speece (2003) argue that cultural dimensions can have a strong impact on the adoption of innovations. At the same time, legal issues, including privacy protection and authentication are other major concerns likely to arise when innovations are associated with the Internet (Rotchanakitumnuai and Speece, 2003).

In their study of Australian SMEs, Lawson et al. (2003) propose that government and industry associations can play a vital role in innovation adoption by raising awareness, training, and funding (Lawson et al., 2003). In the UK, Simpson & Docherty (2004) find significant similarities to the Australian context, but without the desired outcomes, which leads them to conclude that government role and industry associations are necessary but not sufficient for successful innovation adoption.

An environment with success stories and adopting champions can be conducive in innovation adoption (Gharavi et al., 2004). Every successful use of an innovation leads more users to strongly consider it as an option for adoption (Grant, 2004). Also, champions can strategically motivate other potential adopters because they are seen as industry leaders who define adoption trajectories and "provide blueprints for organizing [innovation adoption] by specifying the forms and procedures an organization of a particular type should adopt if it is to be seen as a member-in-good-standing of its class" (Gharavi et al, 2004, p. 763).

3.2   Organizational Context Factors

Organizational factors also play an important role in the adoption of innovations. For example, there is a positive relationship between employee education and the propensity with which innovations are adopted (Warren, 2004). Education consists of the skills, knowledge, and confidence required in operating innovation-related applications successfully. Therefore, education is important because not only affects innovation acceptance but also because it affects human capital by determining its competencies which in turn determine the speed and the coverage of the adoption in organizations (Warren, 2004, Fillis et al., 2004).

Management attitudes towards innovations as well as their perceived benefits are of primary importance to adoption (Rotchanakitumnuai and Speece, 2003). For example, managers who have risk-averse orientations towards innovations are more likely to exhibit negative attitudes towards their adoption. A possible consequence of such attitudes is the failure to allocate necessary resources (Fillis et al., 2004, Basu et al., 2002, Rotchanakitumnuai and Speece, 2003, Tidd et al., 2001), also a significant barrier to innovation adoption (Rotchanakitumnuai and Speece, 2003, Simpson and Docherty, 2004).

3.3   Innovation Factors

The perceptions of the characteristics of an innovation can affect its adoption. As many as thirty distinct characteristics have been found to significantly affect adoption (Tornatzky and Klein, 1982). However, some are more consistent than others in their relationship to innovation adoption. These characteristics include the relative advantage the innovation offers compared to the costs involved in adopting it, its complexity and compatibility with the adopting organisation, and how observable the results of the innovation are (Al-Qirim, 2003, Rogers, 1995, Russell and Hoag, 2004).

Innovations are expected to generate competitive advantage via practical benefits including increased levels of quality and service, efficiency, reliability, etc. (Fillis et al., 2004, Gilbert et al., 2004, Warren, 2004, Taylor and Murphy, 2004, Rotchanakitumnuai and Speece, 2003, Lee and Turban, 2001). An awareness of benefits is a pre-condition for innovation adoption (Flanagin, 2000, Elliot, 2002 Simpson, 2004). A lack of awareness of them is likely to fuel concerns about an innovation. In addition, Rotchanakitumnuai & Speece (2003) imply that innovation adoption is likely to be accelerated as more adopters start experiencing its previously perceived benefits.

On the other hand, perceived set up and on-going costs, technical difficulties and innovation complexity are likely to make innovations unattractive, adversely affecting their adoption (Gilbert et al., 2004, Bodorick et al., 2002, Simpson and Docherty, 2004, Taylor and Murphy, 2004). Simpson & Docherty (2004) also maintain that the integration of innovation-related applications to existing legacy systems may not necessarily be readily and easily carried out without some resistance. The combination of positive and

negative perceptions concerning an innovation represents an organization's readiness to adopt it (Parasuraman, 2000), which may vary by industry sector and organization size (Simpson and Docherty, 2004, Bodorick et al., 2002, Frambach, 1993).

4.   Method

The research reported in this paper in exploratory in nature and utilizes qualitative evidence. We are concerned with the extent to which interpretations of XBRL adoption drivers and inhibitors are sensible in the Australian context (Neuman, 2000). Given the uncertain and intricate nature of innovations like XBRL, we believe that their adoption can be better understood by examining the interpretations of the relevant community members (Wolfe, 1994, Van de Ven and Rogers, 1988, Boonstra, 2003). Finally, as XBRL is still at its infancy in Australia, it was expected that the reliability of quantitative results would be adversely affected by low statistical power effects (XBRLAustralia, 2004, Baroudi and Orlikowski, 1989).

Qualitative empirical data were collected via semi-structured interviews (Shanks et al., 1993), which were used because of their flexibility. Interviews provide rich insights for exploring, identifying, and understanding viewpoints, attitudes, and influences (Healy and Perry, 2000). Moreover, they also allow greater control over the interview situation (e.g. sequencing of questions) while providing the opportunity for making clarifications and collecting supplementary information (Frankfort-Nachmias and Nachmias, 1996, Walsham, 1995, Hannabuss, 1996).

All 27 organizational members[2] of XBRL Australia Ltd. were approached via the XBRL-AU user group and by phone calls. Eleven key informant representatives of these organizations agreed to be interviewed. To maintain anonymity, only the categories of these organizations have been identified in Table 2.

Organization Category	No of Key Informants Interviewed
Large Accounting Firms	4
Software Developers and Vendors	3
Regulatory Agencies	1
Local Consortium (XBRL Australia Ltd)	1
Tertiary Accounting Educators[3]	2
Total Interviews	11

Table 2: Categories of organizations and number of interviews

To allow informants maximum freedom in expressing their viewpoints and give them time to prepare for the interview, they were provided with the same set of open-ended questions a week before the interviews (Flick, 2002). Interview durations varied, ranging from a minimum of 35 minutes to a maximum of 95 minutes. In all, 11.5 hours of interviews were recorded and transcribed. The interviews were focused on perceptions of the drivers and inhibitors of XBRL adoption in Australia, although occasionally supplementary issues arose and were covered. The contents of the interview transcripts were analyzed thematically. Codes were developed which provided the basis for cross-

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2 The current members of XBRL Australia Ltd can be found in http://www.xbrl.org.au/members/
3 The interviewed academics had both been involved in teaching XBRL in tertiary institutions in Australia and they were also members of XBRL Australia Ltd.

case analysis and helped identify and analyze emerging patterns of themes (Carson et al., 2001, Patton, 1990, Rao and Perry, 2004).

We believe that construct validity has been adequately addressed. First, multiple sources of information were used (Yin, 1989). While interviews constitute the primary source of information, some of the informants provided supporting documentation which is comprised of white papers, software, and web resources. In addition, the investigators themselves identified additional supporting documentation including materials located at the websites of the informants' organizations or in publications associated with the industry. Second, as shown in Table 2, the informants belong to different categories of the XBRL community, and therefore, would provide different perspectives. Considering different perspectives constitutes an important type of triangulation of qualitative information sources (Patton, 1990). Third, two investigators conducted ten of the eleven interviews, and both analyzed all of them (Patton, 1990, Denzin, 1989). This kind of triangulation reduces the potential bias which is commonly cited as a limitation of interviews (Frankfort-Nachmias and Nachmias, 1996, Yin, 1989). Finally, the chain of evidence, tracing the conclusions to the interview summary and to the interview transcripts was also maintained. According to Yin (1989) these enhance the construct validity as well as the reliability of the research, thereby boosting its overall quality.

Clearly, the study reported in this paper is based on the Australian context, and therefore, we accept its external validity cannot be ensured. Consequently, our findings may not be readily generalizable beyond this study (Shanks et al., 1993). To ensure generalizability, further research is required, both in Australia and in other contexts.

5   Results and Analysis

5.1   Environmental Context Factors

Local Adoption Strategy

There was consensus among the interviewees that Australia lacks an effective, flexible and responsive local adoption strategy. Such a strategy needs to be in touch with the current local business trends and culture, while also congruent with the global adoption strategies of XBRL International. For example, all informants agreed that awareness campaigns concerning XBRL functionality and its benefits that specifically target potential adopters should be the first step of the local adoption strategy. This would help generate local demand for XBRL and XBRL-enabled software products. The representative of XBRL Australia reinforced this view, indicating that there is little understanding of XBRL in Australia, and in many cases, misunderstandings.

The local adoption strategy needs to take into account the culture of the local XBRL community. For example, one of the academics interviewed argued that accountants, the major group of potential adopters, "are not known to be innovators or leaders in technology adoption". Likewise, informants were consistent in indicating that the general business culture in Australia tends to be of a "wait-and-see" nature, which is not very conducive for adoption:

> "I think it would be fair to say Australia is very keen on take up of technology but not keen to be the first to do it. Always keen to be fast follower. You know, show me where it's been done well elsewhere and I'll be really keen to pick it up and do it as quickly as possible, but not super keen to be the guinea pig… That's a

general comment about the business environment here and the way business sees technology here." (Large Accounting Firm interviewee)

Other factors that were considered important for consideration in the local adoption strategy include geographical location, market size and the size of potential adopters, global adoption pressures and taxonomy maintenance issues. Arguably, being geographically isolated combined with the fear of being left behind can both contribute to push adoption in Australia. Yet, being a relatively small market[4] with relatively small-sized organizations is seen to be negatively related to XBRL adoption:

"[Australian XBRL adopters] are not particularly large targets right now. In the grand scheme of things Australia is a small economy and the budget is much bigger and the amount of effort is the same, so why would we go there [to Australia] first." (Software developer/vendor interviewee)

On the other hand, global pressures can have a positive impact on local XBRL adoption. For example, widespread XBRL adoption in the US and UK would be a strong driver for XBRL adoption in Australia, since Australia's economy is closely tied to those of the US and UK.

Limited Local XBRL Success Stories and Champions

There have been only limited success stories and XBRL champions in Australia. This has restricted the extent to which practical XBRL benefits can be observed in the local context. With this, XBRL enthusiasts may find it difficult to convince the decision makers of their organizations to adopt it. Most informants were consistent in their view that local success stories involving large reputable organizations such as banks, major accounting and auditing firms, and government regulatory agencies (e.g. Australian Taxation Office[5]) would be a significant catalyst for XBRL adoption. These adopters are likely to be regarded as champions, and therefore, generate peer pressure. Some informants argued that one possible reason for the limited number of known success stories in Australia is that some of these are deliberately kept secret to avoid "tipping off" competition concerning emerging solutions. If this is indeed the case, XBRL adoption is negatively affected in three ways. First, potential adopters cannot observe local XBRL benefits live; second, non-standard forms of adoption are likely to emerge; and third, the XBRL development and adoption effort is likely to lose its focus.

Dominant Design of Accounting Standards: The IAS Priority

Currently, XBRL adoption has been adversely affected by other pressing priorities that potential adopters face. The local accounting industry is under pressure from the Australian Financial Reporting Council (AFRC), and are "running at break-neck speeds" to adopt the International Accounting Standards (IAS) by 2005. In XBRL, accounting standards constitute the basis for taxonomy development. Consequently, XBRL adoption has been pushed back. However, a similar argument also applies to other larger world economies which suggests a lesser global XBRL adoption pressure for Australia. This in turn, contributes to a slower local XBRL uptake. In addition, when IAS is eventually in

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4 Together Australia and New Zealand constitute 2% of the world market for XBRL solutions.
5 In 2003, the Australian Taxation Office (ATO) announced its intention to adopt XBRL ICAA, (2003): ATO Adopts XBRL, Accounting and Auditing News Today (ANT), The Institute of Chartered Accountants in Australia, Vol. 38/2003.

place, existing XBRL taxonomies are likely to become irrelevant and obsolete. Clearly, this hinders current XBRL development efforts and slows down adoption. Therefore, the successful adoption of the IAS both locally and globally is a prerequisite which would facilitate the creation of an Australia-wide single taxonomy, and subsequently encourage XBRL adoption.

5.2 Organizational Context Factors

Employee Education

Employees who use XBRL functionality and take advantage of its benefits do not need to be highly knowledgeable in XBRL, since its incorporation in applications and XBRL solutions means that its workings are relatively transparent to them. However, the informants we talked to concurred with the view that these employees need to have some basic understanding of XBRL's functionality and benefits. They also need to be fluent in the applications driven by XBRL:

> "It's easier to use a[n XBRL-enabled software] tool when you understand the fundamental technology underneath it because you know what it can and can't do when you try to push it." (XBRL Australia interviewee)

However, specialized technical tasks such as taxonomy development and maintenance, and the configuration and set-up of XBRL-enabled applications, would be the domain of specialized IT professionals.

Limited Resources

XBRL adoption has been adversely affected by the limited resources available for promoting its adoption. Time, expertise and funding are required for various development efforts, including national adoption strategy formulation, taxonomy development, software support, marketing and awareness campaigns, and training. Currently, contributions to XBRL's implementation in Australia have been largely voluntary and on a part-time basis by a small number of skilled individuals who maintain responsibilities in their regular employment roles.

Further funding and investment is required if XBRL is to move at a faster rate in Australia. Currently, however, it is difficult to make a case for management support and further funding since the payback of XBRL investment is difficult to quantify or demonstrate. Investors in earlier iterations of XBRL development may have become disheartened and reluctant to invest further due to the lack of justifiable returns:

> "They've [the investors] sunk a lot of money into it [XBRL] so far and they've had no return." (Software development/vendor interviewee)

This suggests that the risk of further investments is now higher. As explained by an interviewee from a large accounting firm, this may be one of the reasons why in Australia some of XBRL's original supporters have limited their involvement or even pulled back. It is difficult for investors to see that their earlier XBRL investments were actually part of a normal iterative process of development in which new innovations, like XBRL, are incrementally assessed and redeveloped until they mature.

5.3   Innovation Factors

Limited Software Tool Support

All informants were consistent in the view that there is limited software tool support for XBRL. Software tools were perceived to be important as they enable potential adopters to easily assess the characteristics of XBRL (Rogers, 1995), and therefore, determine the suitability of its capabilities for their needs. Two strands of tool support requirements emerged.

First, there was widespread agreement that off-the-shelf software vendors producing office applications (e.g. Microsoft[6]) and accounting packages (e.g. MYOB) can play an important role in triggering widespread adoption by providing XBRL-enabled extensions or add-ons that can produce XBRL instance documents. This allows potential adopters the opportunity to experiment with XBRL and experience its benefits. This is likely to help create a critical mass of users, and therefore, drive adoption.

Second, there was a consensus among our informants that supporting software tools need to be standardized in the way XBRL instance documents are produced and consumed. One of the software developer interviewees, however, argued that a distinction needs to be drawn between XBRL-enabled software tools and solutions. The latter includes technologies required to service XBRL, supporting teams of skilled people, as well as long term relationships with adopters. These, XBRL solutions involve high support costs which are passed on to adopters, resulting in higher adoption costs. This may affect XBRL adoption negatively. In addition, not all software developers have the expertise to provide quality solutions, again potentially slowing adoption.

Instability of the XBRL Specification

The XBRL specification has undergone significant changes before arriving at its current version. The earlier versions of this specification had serious deficiencies. While the progression through the various versions was considered by some informants as a normal iterative evolution, others viewed it as a major inhibitor to XBRL adoption.

> "We need [an XBRL Specification] that's going to be stable, won't change for a while, gives people the chance to actually evaluate it, get used to it, get things up and running properly." (Software developer/vendor interviewee)

XBRL-enabled software tools are based upon the XBRL specification. The software vendor interviewees, in particular, argued that even small changes in the newer versions of the specification raise serious compatibility problems between software tools that rely on previous specification versions and those that rely on newer ones. Costly redevelopments were necessitated, resulting in wasted effort, delays and non-standard software tools. All these combined, adversely affect XBRL adoption as suggested below:

> "Well the [major potential XBRL adopter] said, we're not going to get involved in this [XBRL]. We'll wait and see until it stabilizes and then we'll do [adopt] it." (Regulatory agency interviewee)

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6 In 2004 Microsoft has released its Office Solution Accelerator for XBRL which creates and analyses XBRL instance documents in Microsoft Word and Excel.

6. Discussion

In general, we find that the results of our qualitative study of XBRL adoption in Australia are consistent with the current innovation adoption literature. In particular, XBRL adoption seems to depend on environmental characteristics, organizational resources, innovation characteristics and readiness, and the process by which the innovation is communicated (Wolfe, 1994, Rogers, 1995, Tornatzky and Fleischer, 1990).

There was a general consensus among informants that the current status of XBRL adoption in Australia is deadlocked as both innovation suppliers and innovation adopters, as well as producers and consumers of financial reports, wait for the other to make the first significant move. As one interviewee suggested:

> "I think the software providers are very unkeen to invest in developing their software to be XBRL-enabled when their clients aren't demanding it. Because their clients would only demand it if the regulators were saying we need it [regulatory filings] in this [XBRL], but on the other hand you can probably see that the regulators are probably sitting back and waiting too." (Large accounting firm interviewee)

The software developers/vendors presented factors supporting their argument for the need to wait before addressing the Australian market aggressively. These factors include a perceived lack of demand bandwidth, a limited domestic market, the size of potential adopters, cultural factors, a relative lack of global XBRL adoption pressure, the IAS adoption priority, lack of managerial support in committing resources to XBRL implementations, instability of the XBRL specification and a lack of IAS-based taxonomies.

The viewpoint of XBRL adopters was slightly different. Generally, they emphasized factors such as lack of a local adoption strategy, a lack of widespread awareness of XBRL benefits, and the IAS priority as major factors justifying the slow XBRL uptake. They were consistent in arguing that demand for XBRL-enabled solutions will not increase until solutions are available that allow them to experience the benefits of XBRL.

A similar "wait-and-see" situation is occurring within the XBRL adopters themselves, namely, between the potential producers and consumers of XBRL reports. Put simply, report producers are reluctant to produce XBRL-based reports unless required by potential report consumers, while report consumers are unlikely to require XBRL-based reports unless producers can make them available.

Most informants forwarded the idea that consumers with legislative powers, including regulatory government bodies such as the Australian Securities and Investment Commission (ASIC), or the Australian Taxation Office (ATO), are the only stakeholders who have the potential to break these deadlocks. If bodies such as these mandated XBRL reporting through legislative requirements, XBRL adoption would be boosted significantly. Such a perspective places government in a critical enabling role in the adoption of technological innovations.

However, some likely implications warrant attention if this strategy is undertaken. First, if regulatory bodies and other adopters were to move their entire operation to XBRL, many of their employees would suddenly become redundant. Second, regulatory bodies can force adoption for their specific needs, which is likely to narrow down the focus of XBRL, and therefore, be a limiting factor to its widespread adoption. Third, making XBRL mandatory may be a labor-intensive and complex undertaking as it requires specific procedures to be followed. This includes ensuring that XBRL will not cause problems to adopters. It also requires amending the relevant legislation accordingly. All

this, combined with a democratic-styled economy and the Australian character which is "very suspicious of authority" would make mandating XBRL adoption time consuming and a highly intricate endeavor.

Although probably difficult to implement, the idea of mandating XBRL may sound promising for the future of XBRL in Australia. However, the counter argument should also be considered. For XBRL to become the standard language for financial reporting, it should be a desired standard rather than an imposed one. Therefore, having to mandate XBRL as a standard before the XBRL community demands it, may suggest that its use in Australia is premature. It is possible that the Australian market may not be ready for XBRL yet. Potential adopting organizations may not be ready to adopt because of lack of motivation which may be underpinned by limited awareness about XBRL benefits, functionality and related costs. These are important as they determine an organization's readiness to adopt an innovation (Parasuraman, 2000).

7.   Conclusion

In this paper, environmental, organizational, and innovation-related drivers and inhibitors influencing the adoption of XBRL in Australia have been discussed. Because of the potential role XBRL can have in enhancing intra- and inter-organizational information supply chains we believe that the findings of this paper constitute an important contribution to the area of e-business. In addition, these may have practical implications for the adoption strategies of local XBRL consortia in Australia and similar national contexts.

We suggest that a critical mass of both adopters and suppliers is required for widespread adoption of XBRL to begin (Markus, 1987, Markus, 1990). Qualitative evidence collected in interviews with members of the XBRL community in Australia suggests that at the present time this critical mass is lacking. While this continues to be the case, XBRL may not have a major future in Australia. However, with XBRL, it is probably practical for adoption to start with pairs of producers and consumers (Grant, 2004). Aggressive awareness campaigns featuring successful champions are likely to start bandwagon effects, enticing partners who are linked via information flow requirements to identify stronger reasons for adopting XBRL. As XBRL becomes more ubiquitous, it also becomes increasingly valuable. This is likely to pool further management support and necessary resources. Also, non-adopters are now likely to face the dangers associated with non-adoption, and therefore, have stronger incentives towards making decisions favoring XBRL. This is likely to spiral until the number of adopters in the XBRL community reaches a critical mass in order for its use to spread further.

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