Improving Information Transparency and Accountability in the Financial Sector:
A Comparative E-Government Implementation with XBRL*,**

by

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Abstract
This paper examines the e-government implementation of the eXtensible Business Reporting Language (XBRL) to increase accountability and transparency in business and financial information. The business and financial information gathered in XBRL format is machine-readable and interoperable, improving its ease of public dissemination and analysis. This paper focuses on identifying and examining the determinants of successful XBRL implementation. It draws from bodies of literature, including e-government, institutionalism, collaborative public management, regulatory compliance, and management information systems to identify determinants of successful implementation. This study selects four diverse implementations: the Netherlands, Australia, the United States, and Singapore. Empirical analysis follows a comparative case study method. The preliminary findings underscore the importance of program goal and strategic alignment in achieving accountability and transparency, the advantage of strategy correlating to institutional setting, the critical need to provide incentives for adoption, and the usefulness of incremental implementation. The managerial and theoretical implications of these findings as well as future research opportunities are explored.

Introduction
The lack of financial transparency was one of the main causes of the financial crisis of late 2008. The magnitude of the financial meltdown drew the attention of public administrators and public managers around the world. Complex financial instruments, such as mortgage-backed securities and their derivatives, masked underlying risks. Motivated by financial incentives, investment institutions in the financial sector hid and passed on these risks via the creation of complex financial instruments designed to maximize short-term profits.

Government has the responsibility and is well-positioned to safeguard the health of the financial sector (Khademian, 2009). Government is accountable to citizens and businesses insofar as it is responsible for maintaining the financial health of the country. Citizens and businesses regard government as the last line of defense in times of financial crises. More broadly, citizens hold government accountable for spending tax monies effectively and efficiently when providing public services such as monitoring and maintaining a healthy financial sector. Government has the unique role of safeguarding the interests of the general public, rather than the financial interests of a few. Government has played the role of monitor, regulator, and rescuer in the evolution of the financial market. Thus, debates center more on how government should best be involved, not whether it should be involved (Peretz & Schroedel, 2009).

This notion of government accountability over the general financial health requires that it go beyond improving transparency of investment activities; it must also guarantee the effective and efficient monitoring of a country’s economy and its implications for financial health. Many governments have passed regulations and/or administrative rules requiring that businesses and
citizens report business and financial data to gather information needed for monitoring. However, the increasing number and complexity of reporting requirements have created undue administrative burdens for reporting entities and reporting costs can have substantial impacts on the economy. At the same time, the increasing amount of information collected and inconsistency in reported data may further weaken the effectiveness of government trying to understand the financial sector and economic activities.

Thus, collecting, analyzing, and disseminating information to improve transparency and accountability in the financial sector is a fundamental challenge facing government. Accurate and timely financial information is the foundation of any informed financial and economic decision, whether made by individuals, institutions, or government. One challenge is the lack of data standards for business and financial information. For government, the lack of a standard business identification numbering system for various government agencies impedes the ability to make sense of financial and business information submitted by businesses. On the business side, compiling business and financial reports for various government agencies with differing data definitions and rules is burdensome. For investors, it is difficult to compare the financial performance of two businesses when, for example, the definition of “expenditure on equipment” differs across agencies. Another information challenge arises when one tries to extract financial information from various reports and try to aggregate it into a systematic/sector overview. Clearly, manually processing data extraction from paper or PDF reports is time-consuming and error-ridden. Even when financial information is collected electronically, the integration of data elements from various data sources is difficult without a common data standard.

Recent developments and implementations of a standard business reporting language known as eXtensible Business Reporting Language (XBRL) have shown some initial success in addressing these challenges. At the heart of XBRL is a data dictionary (taxonomy) that standardizes the financial terms used. Such standardization allows for meaningful comparison of financial information across businesses and allows for the aggregation of financial information across a business sector for monitoring purposes. Moreover, such a taxonomy enables the development of software applications to make the financial information machine-readable. Once stored in XBRL format, businesses can transmit the information electronically to government for reporting purposes. Hence, the burden of manual processing can be significantly reduced.

Government, when using XBRL as a standard, can be more efficient in gathering and analyzing financial and business information. XBRL also allows for business rules to be embedded, which enables automatic validation of business rules in financial reports. Such automation is a significant efficiency gain, as seen, for example, in the FDIC’s implementation project.
Advancements in information technology offer opportunities for improving the collection and dissemination of financial and business information. For example, Web 2.0 technologies allow citizens to share information on financial institutions and government accountability. The U.S. government’s website Recovery.gov tracks the spending of government funds disbursed under the American Recovery and Reinvestment Act and allows citizens to report fraud. Moreover, the development of the semantic Web (Web 3.0) lets citizens analyze and evaluate financial risks of government policies by combining relevant government data sets. XBRL is viewed as a Web 3.0 technology, where financial information is machine-readable and standardized for meaningful comparison. Once XBRL is made available on the Web, it has the potential for introducing a new era of open government.

To date, there has not been enough scholarly attention focused on the obstacles to improving transparency and accountability in the financial sector, though transparency is regarded as a basic requirement for informed citizen participation in a democratic society. As a policy tool, targeted transparency can be effective in improving product safety (Fung, Graham, & Weil, 2007). While scholars recognize the importance of transparency in preventing financial crises (Khademian, 2009), there has not been enough discussions about how to address the information technology dimension of transparency. Scholarly attention on accountability has dealt with identifying various dimensions of accountability (Dubnick, 2008; Romzek, 2000) and complexity and conflicts in implementing accountability (Koppell, 2005). There is comparatively less discussion on information requirement and management—both of which clearly would lead to improvements in accountability.

To fill this knowledge gap, this paper will focus on the information technology dimension of improving transparency and accountability in the financial sector. The focus is on XBRL implementation. The research question is “What are the determinants of successful government use of information technology and data standards to increase financial transparency and accountability?” Answering this question would contribute to both the information technology dimensions of financial transparency and accountability and the implementation of e-government and data standards.

The next section begins with a basic definition of information transparency and accountability and then explores the factors affecting successful e-government implementation of XBRL. The empirical investigation of these factors starts with data and methods, then four cases of XBRL implementation are examined to explore the relevance these factors and their nuances have for different contexts. Discussions and conclusion focus on the implications of the findings and opportunities for future research.
Improving Information Transparency and Accountability with e-Government XBRL Implementation

This section first delineates the scope of information transparency and accountability with regards to business and financial data. This study defines e-government as the development and use of information and communication technology to advance public services. Next, it develops an understanding of the factors contributing to successful e-government implementation for XBRL, drawing insights from a range of relevant literatures.

Transparency and Accountability in the Financial Sector

Transparency in government has roots in the notion of democracy. Democracy requires that citizens be informed of government activities in order to participate in governance. Transparency, by design, addresses the information asymmetry between government and citizens, where government can monopolize policy information. For example, the United States’ Freedom of Information Act aims to remedy some of this asymmetry. Over the past decade, the notion of open government has begun to gain recognition. During the last five years, countries like India and China have recently passed freedom of information laws to provide a higher level of government transparency. The Obama administration’s Open Government Initiative regards transparency as the first pillar that enables citizen participation and collaboration.

Government transparency in a broad sense is about making information available to advance public interests. A conventional sense of transparency is communicating government performance information to the public as a means to make government accountable for its spending of tax revenues. Truthful information on organizational performance is the essence of such communication (Koppell, 2005, p. 96). A more contemporary notion of transparency includes using transparency as a regulatory policy tool. Targeted transparency is effective, for example, when citizens (consumers) are given relevant information that enable them to drive the market and advance the public interest (Fung et al., 2007, p. 3). For example, the publication of motor vehicle safety ratings has been used as a regulatory tool to improve vehicle safety as a public interest (Fung et al., 2007, p. 3).

The present study adopts a broad notion of transparency with regard to the financial sector; it is understood as government making information accessible and available in order to improve the general financial health (a public interest). The relevant actions include collecting, analyzing, and disseminating business and financial information, as well as organizational performance on such functions to further ensure the health of financial systems. The collection aspect may encompass, for example, setting data standards for financial reporting to generate useful information for transparency. The dissemination aspect may encompass making business
and financial information available to the public. With advances in information technology, dissemination is done increasingly online via government websites.

Public accountability is a complex concept. Dubnick (2008), in a recent review of the scholarship on accountability, recognizes the complex and often confusing notions of accountability. A basic way to disentangle accountability is to ask accountability to whom, for what, and how (Romzek, 2000, p.415). Based on an analysis of source of control and level of discretion involved in accountability mechanisms in the United States, Rozmek (2000) articulates the accountability relationships that a public administrator needs to address. These include: hierarchical, legal, professional, and political relationships. Achieving public accountability for an organization is usually challenging when trying to balance and maximize multiple dimensions of public accountability (Koppell, 2005). For example, there exists an inherent tension between responsiveness and controllability--the former maximizes speed and the latter aims to maximize quality through multiple layers of review and analysis.

A traditional notion of accountability centers on compliance with rules and regulations to limit bureaucratic discretion (Light, 1993, p.12). It grew out of the context of exercising political control over bureaucracy as a way to ensure the proper production and delivery of public service. A contemporary notion of accountability places more emphasis on outcomes of public services and external communication (Kearns, 1996).

This study focuses on two contemporary aspects of accountability that are relevant to the use of information technology in advancing public interests in the financial sector. First, this study emphasizes accountability in the sense of performance for the general public. Efficiency is the focus: efficiency in gathering, managing, and disseminating financial information. Second, this study emphasizes the information aspect of accountability, with a focus on external communication. Of course, both of these aspects overlap and are intertwined.

**Determinants of E-Government Implementation Success**

The literature review below organizes various insights from diverse bodies of research literature, showing how these insights shed light on electronic government implementation success. These bodies of literature cover diverse topics, such as e-government, institutionalism, collaborative public management, regulatory compliance, and management information systems.

**Addressing Institutional and Structural Contingencies**

Institutional context matters in e-government implementation. Seidman (1970) argues for the importance of institutional settings and organizational structure and processes in determining the relative power and influence of various actors in a policy or program. Institutions, in the sense
that they consist of a set of rules, affect organizational and individual behavior via the force of isomorphism (DiMaggio & Powell, 1983) and reputational control (Ostrom, 1998). Fountain’s (2001) examination of U.S. federal agency adoption and use of information technology further highlights the influence of institutions and organizations in the implementation of technology.

The history of institutional development also constrains or enables e-government implementation. Douglas North (1990) has highlighted the path-dependent nature of institutional change. A federal administrative system is more conducive to consensus building and collaboration in e-government if a more centralized administrative system prefers central planning and implementation of e-government. The high cost of system change usually prevents administrative reform until the existing system collapses. Change in the level of constitutional rules is far more difficult than rules at the operational level, since the former kind of change can alter the distribution of resources and power (Ostrom, Gardner, & Walker, 1994).

The role of institutions becomes more pronounced in comparative studies of e-government. Institutions are an important explanatory variable for the variation in e-government practices as shown in several comparative studies of e-government (Chen & Knepper, 2005; Heeks, 1999; Hernon, Cullen, & Relyea, 2006; E. Welch & Wong, 2001). For example, a country that has a set of facilitating laws and regulations for transparent government is more likely to make unfiltered public service performance information online than one that does not have such laws (Chen & Hsieh, 2009).

Implementing e-government as institutional change presents both a challenge and an opportunity. The historical and contextual nature of institutional change requires an enhanced understanding of the rules and norms involved. Ostrom et al.’s (1994) classification of constitutional, collective-action level, and operation-level rules are instructive in anticipating the changes required and effectiveness of incentive systems. Opportunities exist for public administrators and citizens alike to be agents of change in making strategic choices in the area of e-government (Yang, 2003).

E-Government implementation is more likely to succeed when a strategic implementation choice addresses the unique characteristics of the structural and institutional context. The experiences of information integration projects underscore the importance of addressing the institutional, organizational, and technical contexts (Pardo & Tayi, 2007). Realizing effective implementation involves a network of organizations, and Provan and Kenis (2008) offer some preliminary recommendations for better governance that can address the unique configuration of key structural and relational contingencies. For example, a lead organization is more likely to be
an effective governance structure than one that is participant-governed, especially when there is only moderate/low goal consensus and the need for network-level competencies is high.

The above discussion points toward both the importance of understanding the institutional and structural contingencies surrounding an e-government implementation and the proper configuration of governance structure addressing these contingencies. Empirical analysis of e-government implementation requires identification of these institutional and structural contingencies and an assessment of the extent to which a proper governance structure is put in place. In this paper it is assumed that the better the governance structure addresses the key institutional and structural contingencies of the e-government implementation, the more likely such an implementation would be successful.

**Strong Management and Political Support**

A successful implementation of a large-scale complex information technology/system project usually requires strong management support. The literature on management information systems emphasizes the role of top management support. Top management support is able to address resistance to change accompanying the introduction of new information technology and can provide the needed resources for implementation. Several studies of complex information system implementation, such as Enterprise Resource Planning or Executive Support systems, underscore the importance of top management commitment (Bingi, Sharma, & Godla, 1999; Poon & Wagner, 2001; Willcocks & Sykes, 2000).

Political commitment in achieving public service goals via electronic means is also critical because e-government projects tend to modify and change existing practices. Studies of bureaucratic politics suggest that governmental actions are a product of bargaining and compromise among various units of government (e.g. Allison, 1971). In many ways, the introduction of new information technology can pose challenges to the existing political and institutional structure of the public organizations involved (Fountain, 2001). The adoption and use of information technology is as much a managerial decision as a political decision; the decision usually occurs against the backdrop of administrative reform (Ho, 2002; Tolbert, Mossberger, & McNeal, 2008). One empirical study in e-government has underscored the importance of political support; this case study focused on the support of county supervisors for the adoption of a website (Ho & Ni, 2004).

Political commitment is likely to play a more critical role in the context of an e-government implementation that requires a high level of cooperation and coordination. Consideration of turf is important in understanding the success and failure of any policy implementation that involve multiple government agencies (O'Toole, 1997; O'Toole & Montjoy,
Any implementation that requires cross-boundary collaboration is likely to run into turf issues (Bardach, Kettl, & Milward, 1996). For example, who owns data and who has control over data are usually highly debated issues in information system projects that cut across multiple agencies (Dawes, 1996). Sometimes, political commitment can come in the form of a legal mandate that requires government agencies to adopt a new information system. Such a scenario would be a useful way of facilitating the implementation of a public sector knowledge management network driven by information technology (Dawes, Cresswell, & Pardo, 2009).

**Proper Incentive Scheme for Technology Adoption**

Research on adoption and use of information technology shed light on the conditions under which an individual user is likely to adopt new information technology. The technology acceptance model identifies perceived usefulness and perceived ease of use as two overarching factors determining a user’s intent to adopt a new piece of information technology (Davis, 1989). One example of usefulness is assistance in improving job performance. Perceived ease of use relates to the usability of the information system as well as the technical capacity of the user. The Unified Theory of Acceptance and Use of Technology (UTAUT) further examines the conditions leading to the perception of usefulness and ease of use (Venkatesh, Morris, Davis, & Davis, 2003). It synthesizes other theoretical perspectives, such as those that can be gleaned from literature on innovation, to understand the social dynamics involved in human perception of technology. The perception of usefulness can be fostered by a trusted peer who is able to show the benefits of using a new system. The perception of usefulness can also be changed by a mandate stipulating the use of a new information system. Moreover, of course, actual improved usability can improve the perception of usefulness.

Various studies of organizational adoption of information technology have highlighted a number of organizational characteristics. Technical capacity of a government has a positive relation with the adoption of information technology. The technical capacity of the key decision makers in an organization is likely to shape the decision for the adoption of information technology for that organization (Lee, 2008). Moreover Moon and Norris (2005) have underscored the importance of managerial innovativeness in the adoption of e-government websites for local government in the United States.

Policy tools are available to change the cost-benefit analysis of technology adoption and use. On the individual level, incentive systems can be designed to increase the perceived benefits of technology adoption and use, while also reducing the cost by improving usability. On the organizational level, government can design incentives for organizational adoption. Which is to say, government can change the perceptions of benefit by articulating the benefits for the
participating organization and reducing the cost of technology through providing technical assistance.

Policy tools can be voluntary or mandatory in nature. The lessons from implementing voluntary programs in the United States are instructive. Usually limited effectiveness is observed when there is a lack of rigorous regulatory structure in the background. Welch et al.’s (E. W. Welch, Mazur, & Bretschneider, 2000) empirical investigation of the Climate Challenge program underscores this argument. Nonetheless, opportunities exist when firms can associate participation in these voluntary programs with the benefits of branding. Requiring by mandate the use of a particular technology solution or standard can significantly affect the adoption decision because it would make the cost of non-compliance too high. Nevertheless, a wide range of options is available between the two extremes of requiring by mandate and merely encouraging participation in a voluntary program.

**Competent Incremental Implementation with the Creation of Public Value**

Managerial capacity is important for successfully implementing an e-government project (Brown, O'Toole, & Brudney, 1998; Chen & Perry, 2003; Melitski, 2003). The lessons from network management also point toward the importance of managerial capacity. For example, McGuire and Silvia’s (2010) empirical research support the importance of managerial skills in managing intergovernmental collaboration at the local level. Specific to e-government projects, IT management capacity, as a significant portion of IT services, can be delivered via service contracts with IT service companies. Reddick (2004) suggests that IT management capacity at the state level has a positive effect on the adoption of state e-government transactions.

Project and change management skills are critical for successful information system implementation. Complexity of e-government projects increases with expansion of the types and number of organizations participating in them; in such cases, social, technical, and behavioral issues all come into play (Pardo & Scholl, 2002). This implementation complexity lies in mapping the resource dependence of organizational relationships and resolving issues related to addressing these interdependencies (Pfeffer & Salancik, 2003; Rethemeyer & Hatmaker, 2008). Project management is an essential skill in managing large information system projects (Yardley, 2002). The failure of government IT projects also highlights the need for better project management skills.

Phase-in implementation is one of the main strategies for change management. A phase-in implementation has several benefits. First, it increases the return on resource investment by focusing on high-value components. For example, digital security policy will begin with the identification of high-value digital assets and then focus organizational resources on these assets.
Second, it allows for more time for maturing and developing technology for e-government implementation. This is particularly germane to cases wherein the development of a new software program is part of the implementation. Lastly, such strategy helps lower the implementation cost of small organizations when they are phased-in after large and medium organizations.

Focusing on the creation of public value should be at the core of project and change management. What separates e-government projects from information system implementation is the attention to public value. The focus on public value also implies certain trade-offs, because government tends to pursue multiple policy objectives rather than a single one at a time. A proven strategy that can help focus project management on public value is the Earned Value Management (EVM) approach which was introduced by the U.S. Office of Management and Budget. This strategy is based on clearly articulating certain earned values, such as improved adoption rate, data quality enhancement, and improvements in service quality (as related to e-government projects and for a particular period). Public value should also guide change management. Initiating reporting compliance with large firms makes sense when one of the policy objectives is to lower the burden of compliance on small firms.

**A Comparative Case Study of XBRL Implementations**

This section covers the data and methods of this four-country comparative case study of XBRL implementation. The case description provides the rationale, context, and a brief history of each case. Then, the comparison will examine and discuss four factors for e-government implementation success.

**Data and Methods**

A multiple and embedded case study approach can help us address the present study’s primary research question. Yin (1994) suggests that the case study method is a fruitful strategy when posing “why” and “how” questions. This is especially the case for studies that have no control of contemporary events. Over the past several years, XBRL implementation has been seen as “contemporary events” which university scholars have little control over. Moreover, the determination of success factors in XBRL implementation as an e-government implementation requires a good understanding of “why” and “how” questions.

The choice of multiple cases follows the replication logic rather than a sampling logic (R. Yin, 2003, p. 21). The cases chosen for the present study involve XBRL implementation completed with varying degrees of success (i.e., with regard to transparency and accountability in the financial sector). The aim is to see whether some of the factors contributing to implementation success can be replicated in different institutional contexts. The case study research design
features an embedded approach; efforts have been made to examine critical events and the behavior of key participating organizations inside a particular implementation case. This embedded strategy utilizes multiple units of analysis. Specific programs, historical events, and participating organizations and individuals can all serve as sub-units of a case (R. Yin, 2003, pp. 35-55). The embedded case-study approach allows for the introduction of natural experiment. Moreover, this strategy is consistent with the advice on increasing the number of observations in making valid inferences (King, Keohane, & Verba, 1994), especially for implementation studies that tend to confront the small “N” issue.

Data sources include official documents, journal and magazine articles, case studies, presentations, and interviews. Most of the data is obtained either via the XBRL International website, a non-profit organization that serves to provide resources and assistance for the development of XBRL, or the program office for each of the implementation site. Interviews with the key managers of these implementations serve as an important source of information. The interviews shed light on the strategic considerations underlying the critical events and determinants of success, as well as serve as essential documentary sources.

The data collection process began with talking with several individuals who had knowledge of government XBRL implementation in various countries. This served as the point of departure for identifying the resource sites and the basis for building technical knowledge about XBRL. Then, an extensive review of the documents was conducted, focusing on the four selected XBRL implementation cases. This generated an in-depth understanding of the implementation cases, including the history, political and organizational contexts, scope, project leader and organizational participants, management strategies, and results. Then, the researcher conducted interviews with project managers to understand the implementation strategy and strategic considerations.

Data analysis is a combination of testing theoretical propositions and building grounded theory. The researcher used the theoretical propositions developed via literature review as a guide for identifying and cataloging key factors; this followed the suggestions of Yin (2003) and Miles and Huberman (1994) with regard to data analysis. Data analysis involves pattern matching, explanation building, process-tracing and recommended tabulation techniques. Data analysis also allows for the introduction of new concepts or relationships as revealed by empirical evidence and when consistent with the grounded theory approach (Strauss & Corbin, 1990). Yin (2003) considers exploring alternative interpretations as a cornerstone of quality data analysis for case study research. In the present study, efforts were made to consider alternative explanations to improve the rigor of analysis.
Case Description with Structural Characteristics

This section is a brief description of the context for each implementation. Attention is paid to motivations, implementation agency, stakeholders, and implementation strategy. The key structural characteristics are summarized in Table 1.

[Insert Table 1 Here]

The Netherlands

The Netherlands’ effort to implement XBRL is arguably one of the first implementation conducted on a national scale. The Netherlands began its comprehensive national taxonomy project with XBRL as the default taxonomy. The open-source platform and its supporting international community were two main reasons for selection of XBRL. The taxonomy project was the crucial step toward reducing the administrative costs incurred by businesses when they interact with government. The Cabinet regarded this project as one of its top priorities, especially with the goal of achieving “cheaper, easier, and high quality regulatory reporting for business”.¹

The Ministry of Finance and the Ministry of Justice formed a partnership in 2004 to initiate the project and they provided the necessary resources (The Dutch Taxonomy Project, 2008). The project office has been housed in the Ministry of Finance. The Ministry of Justice’s responsibility for business reporting compliance issues made it a natural partner. The Ministry of Economic Affairs, the Tax and Customs Administration, the Chamber of Commerce, Statistics Netherlands, and the Advisory Board for Administrative Burden are other main governmental agencies participating in this project. Three main groups constitute the organizational players in the business community. The first group consisted of reporting businesses and their trade associations, notably the Confederation of Netherlands Industry and Employers and the Royal Association MKB Netherlands.² The second group consisted of the intermediaries that handled the reporting, including the Dutch Federation of Accountants. The last group was the software developer industry that held the keys to translating the taxonomy into software code. Overall, approximately 1.5 million businesses will be affected on the reporting side, 30,000 accountants will serve as intermediaries, and 180 software developers will work on XBRL solutions.³ The 1.5 million reporting businesses encompass all sectors of the economy.

³ Information was collected from Madden, Paul, 2009, Standard Business Reporting.
The XBRL implementation in the Netherlands went through two main phases. The first four years of implementation from 2005 to the end of 2008 focused on building the XBRL-based taxonomy (The Dutch Taxonomy Project, 2008). It has narrowed standards and harmonized data elements and received recognition from the Dutch government for filing business and financial information. In early 2009, the Dutch Taxonomy Project became the Standard Business Reporting program; it better reflects the overall mission of reducing the business reporting burden and increasing government efficiency. This SBR program was assigned to the “Central Government Reform Program” (Standard Business Reporting NL (HNTP), 2009). Regulatory reporting using XBRL by business is voluntary. The Dutch SBR program and its predecessor, the taxonomy project, do not mandate the use of XBRL. Businesses can base their XBRL adoption decision on their own cost/benefit analysis.

### Australia

The Australian Standard Business Reporting (SBR) using XBRL as the default standard began in 2006 and received broad-based support. The primary reason Australia’s SBR chose XBRL was because it could minimize the regulatory reporting burden on businesses while maximizing the protection of public and private interests via regulation. Other methods can result in a reporting burden that may cost senior management up to 25 percent of their time. XBRL can reduce and even eliminate such inconsistency resulting from various regulatory reporting requirements that use different definitions.4

The Ministry of Treasury has led the SBR initiative. Starting in August 2006, the ministry worked and consulted with key stakeholders to expand to all levels of government and all main stakeholders in the business community. This was done to examine the business case of SBR and its possible introduction. Collaborating government agencies included the Australian Prudential Regulation Authority (APRA), the Australian Securities and Investment Commission (ASIC), the Australian Taxation Office (ATO), the Australian Bureau of Statistics (ABS), and State and Territory revenue offices (SROs). On the business side, the program works closely with members of the SBR Business Advisory Forum as well as entities from the accounting profession, such as the Institute of Certified Bookkeepers and CPA Australia. The SBR program was officially launched in August 2007 and it was housed under the Ministry of Treasury. The SBR program has received both political and resource commitment since its inception. This program continued

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4 For example, an analysis of these regulations reveals that an Australian Business Number, one of the most basic data elements for regulatory reporting, has been associated with nine different names across multiple forms in Madden, 2009, Standard Business Reporting.
to receive broad-based support; it was incorporated into the Council of Australian Governments’ (COAGs) new regulation reform agenda in 2008.

Australia’s SBR/XBRL implementation has developed a taxonomy and built processes and tools for standardization. The SBR program released the first cycle of the SBR taxonomy in March 2008. Taxonomy was developed via multiple iterations. By September 2008, cycle 2 taxonomy was completed, and 20 forms in scope could be supported. With the release of cycle 3 taxonomy in March 2009, all 86 forms in the SBR’s scope were covered. The iterative nature of the taxonomy development allowed for ongoing discussions with software developers to assist in building processes and tools for standardization. The program office approved the contract for the design and development of a single sign-on solution and a set of core services in July 2008. Software development was well underway by August 2009. The official filing of business reports using XBRL format commenced in July 2010.

This XBRL implementation impacts approximately 2.1 businesses in Australia on the reporting side (Madden, 2009, p.9). Over 100,000 accountants and more than 240 software developers are also affected by the implementation. The use of the XBRL format is voluntary for regulatory reporting purposes. The benefits of standardization via XBRL, as the Australian government argues, should help persuade businesses to adopt it.

Singapore

The primary motivation for Singapore’s adoption of XBRL is to improve the efficiency, transparency, and accuracy of financial and business information reporting. Efficiency lies in the implementation of a one-stop portal for businesses. Such implementation also enhances the transparency of financial activities in Singapore, and in turn promotes an environment conducive for business. Accuracy is also an important goal. XBRL was the standard of choice due to its nature platform and strong support from both the software development community and other stakeholders.5

Singapore’s Accounting and Corporate Regulatory Agency (ACRA) has spearheaded the XBRL implementation. ACRA has engaged the main stakeholder groups and worked diligently to address their concerns. More specifically, ACRA worked closely with the Institute of Certified Public Accountants of Singapore (ICPAS), which represents accountants doing most of the reporting for small and medium sized businesses.6 The implementation began with a thorough


6 Majid, Muhammad Hidhir and Ivan Koo, 2008, XBRL: One Year On.
feasibility study that had begun as early as 2003. With positive findings, ACRA proceeded with awarding the implementation project contract in February 2006. The first year of implementation saw over 40,000 companies using FS Manager. The final version of the FS Manager went live for filing in November 2007. Approximately one quarter of these reports were the full report version.\(^7\)

The scope of this implementation can be characterized as one agency, multiple (or all) industries. ACRA regulates all registered businesses in Singapore. Approximately 30,000 listed companies in Singapore in all industries were included in this implementation effort.\(^8\) Most of these companies were small and medium sized enterprises (SMEs). The reporting of essential financial information using XBRL format is mandatory. However, businesses can voluntarily choose whether to report other financial information using XBRL.

**U.S. Securities and Exchange Commission (SEC)**

The primary motivations for the SEC to leverage XBRL include increasing efficiency of financial data gathering, improving data quality, and achieving transparency. The interactive data project highlights the importance of transparency in achieving the SEC’s larger mission of providing timely and quality financial information to investors. Broadly defined, the stakeholders for the XBRL project include investors, issuers, auditors, analysts, technology professionals, regulators, and an entire spectrum of organizations and individuals who file and use financial data.\(^9\)

The SEC is the sole agency leading the project. It is not required to coordinate with any other government agencies. However, because XBRL implementation is considered federal rule-making, public notice and comments are required. All public traded companies regulated by the SEC is covered by this implementation. These are companies listed on the NYSE and NASDAQ and securities brokerage firms, covering a wide range of industries.

The SEC’s XBRL implementation has evolved over time, shifting from the voluntary to the mandatory use of the XBRL format. Initially, the SEC took a non-mandatory approach when launching its voluntary program in April 2005. Participation was rather limited. Less than two percent of the companies covered by SEC rules and mostly large ones joined the voluntary program (Efendi, Smith, & Wong, 2009). In mid 2008, the SEC considered a proposed mandatory rule and made the final decision to transition to the mandatory approach in December 2008. Year

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\(^7\) Ibid.
2009 marked the first year of SEC implementation in which companies of $5 billion or more of market capitalization were included. Year two brings all other large accelerated filers, and year three requires all remaining filers.\(^{10}\) The transparency brought by XBRL reporting combined with the Interactive Data Initiative is likely to become increasingly enhanced as more companies participate in XBRL reporting and as more analytical tools are developed to take advantage of XBRL financial information.

**Implementation Characteristics and Outcomes**

This section focuses on the four implementation characteristics which were identified in the literature review, and which served as the basis of empirical investigation. The preliminary outcomes of XBRL implementation are also identified. Empirical evidence is drawn from the various data sources explained above. A summary of the four characteristics and preliminary outcomes are in Table 2.

[Insert Table 2 Here]

**Fit to Institutional and Structural Characteristics**

The implementation of XBRL for standard business reporting, encompassing an entire national government, as seen in the cases of the Netherlands and Australia, requires a central and resourceful government agency for coordinating among governmental offices as well as stakeholders in professional associations (accounting) and software industry. The federal government of Australia has to work across government agencies at the federal level as well as those at the state and local levels. The complexity of working with a large number and diverse group of stakeholders as identified earlier in Australia’s case would require a more centralized approach for implementation. The Netherlands implementation was characterized by a similar level of complexity. A significant amount of work went into coordinating various government agencies as well as stakeholders in business communities. In comparison, the SEC’s implementation was a single agency effort that did not require coordination with other governmental agencies in setting data standards and reporting requirements. Singapore’s ACRA implementation was also a single agency effort. However, the complexity of working with businesses from all sectors of economy still requires a strong central point of coordination to address the diversity of financial information involved.

The institutional constraint on using a voluntary approach places further demand on the implementation office. The implementation office has to persuade other government agencies to make XBRL implementation a policy priority as well as provide training and outreach for all

\(^{10}\) SEC, February 10, 2009, *Interactive Data to Improve Financial Reporting; Final Rule.*
stakeholders. As revealed in the interviews with SBR program managers, the voluntary approach is a fundamental policy direction set at the beginning of the implementation.\footnote{This statement is based on the interviews with the program managers for both the Netherlands’ and Australia’s SBR/XBRL projects.} The political and implementation cost of switching to a mandatory one is rather high and likely to derail the entire project. In contrast, Singapore’s implementation of XBRL did not face the institutional constraint of having voluntary approaches as a preferred policy option. Business communities in the United States have preferred voluntary programs with regards to regulatory efforts. However, regulatory agencies are not constrained by a particular preference and can achieve regulatory goals with the appropriate approach of their choice.

The combination of cross-agency coordination and the diversity and number of stakeholders involved in SBR/XBRL implementation place a much higher demand on the Netherlands and Australia. In response, the Netherlands and Australia need to have a central implementation agency with a significant number of resources. A fitting strategy under the constraint of the voluntary approach would require even more resource input to conduct outreach, education, and even provision of specific incentives for participation. Against this backdrop, the Netherlands scored low on fit due to joint-office implementation with limited authority and resources. Australia scored relatively better with its one agency implementation strategy, which gave moderate authority to decide various aspects of implementation.

The strategies of Singapore’s ACRA and the SEC do not require the level of centralization and resource inputs as those needed for the cases of the Netherlands and Australia. The single-agency strategy for both the ACRA and SEC cases exceeds what is needed for successful implementation; only a minimum degree of interagency coordination is involved. Neither case has the institutional constraint on implementing a mandatory approach, which requires less resources for coordination and outreach than a voluntary approach. With these minimal constraints, both cases fared well, having full authority in determining the appropriate regulatory strategy.

**Political and Managerial Support**

Political support takes the form of articulating XBRL implementation as a public policy priority. Standard business reporting should ideally involve the entire government. Political support for achieving agency mission is sufficient in the context of single agency implementation. Managerial support ideally should take the shape of top management commitment to the project and implementation resources. More political and managerial support is needed when the
complexity of implementation increases with the multiplication of diverse organizational interests.

Australia’s implementation received a medium level of support, relative to the high level of support needed to succeed. It received initial political support in 2006 as part of a broad-based administrative reform. This political support was sustained by the inclusion of SBR/XBRL as the Council of Australian Governments’ (COAGs’) new regulation reform agenda of 2008. Managerial commitment to implementation totaled nearly $243 million over four years (Madden, 2009). Examining the Australian SBR office website indicated a high level of activities and managerial support from the Treasury Office. The XBRL International Conference in 2009 was additional evidence indicating the clear managerial commitment and resource received in implementation. In contrast, the Netherlands’ implementation received comparatively less support, relative to the higher standard required for standard business reporting. There was initial political support to launch the taxonomy project as an innovative effort to reduce the administrative burden placed on business compliance with regulatory reporting. The rebranding effort in 2009 signaled another wave of political interest. The resource allocated to the Program office, however, was deemed less than needed to carry out the tasks of coordination, education, and outreach.

The SEC’s implementation has received high-level sustained political and managerial support. Political support originated on the belief of providing financial information to investors as the main strategy for promoting the financial health of the nation, which embodied the core mission of the SEC. Moreover, political support was articulated in the Bush’s Administration advocacy of e-government. Moreover, XBRL implementation has been considered one of the central projects and commitments of the Obama administration’s open government goal. A high priority has been set on making government information available to citizens. Thus, managerial support came from Chair Cox’s championing of XBRL implementation during his term. The strategic alignment between this project and the broad-based federal government e-government initiatives helped with securing financial resources.

Similarly, the XBRL implementation in Singapore has received a high level of political and managerial support. Political support was the result of the strong national emphasis on making Singapore a business friendly environment through reducing the burden of regulatory reporting. This support came also from Singapore’s emphasis on improving its investment environment. Thus, increasing financial transparency has been one of the main strategies. The

12 This was gathered from an interview with Paul Wilkinson in the fall of 2009.
project has received sustained managerial support. Needed resources were allocated for investing in the development of XBRL reporting compliance software and making it freely available to businesses. Managerial support was also evident in the amount of resources directed at providing technical assistance in the use of the government-sponsored software program.

**Providing Incentives for Adoption**

Both the Netherlands and Australia provided low to moderate incentives for businesses to adopt the XBRL format. The fundamental challenge for both cases of implementation was seen in the voluntary approach to reporting and in the transition cost associated with moving to the new system. Both cases of SBR/XBRL implementation have devoted a significant portion of their effort to making the business case for switching to the new format. One argument pointed out the efficiency gains resulting from having integrated financial information. An integrated view of financial information, it was noted, enhances both various reporting objectives as well as business intelligence (Stantial, 2007). For small and medium businesses, however, the smaller scale of operation does not gain from the integration of financial data across borders and business units. In most cases, for smaller and medium-sized businesses, the additional expenses required to be in compliance with the new format come from accounting service providers that tend to charge extra fees for using the XBRL format. The hope, of course, is that accounting services would pass on their efficiency gains through using the XBRL format to their clients. But this can work against the interests of the accounting firms.

The Australian SBR Office has sought to address the challenges associated with incentivizing small and medium-sized businesses by working with small business associations. The SBR Office has worked closely with these associations to understand their concerns and jointly develop the business case. Small business associations then conducted outreach to articulate to their members the relevance of XBRL implementation. Moreover, the Australian SBR Office has worked closely with software developers to provide technical input that can help bring down the cost of software development, ultimately, to reduce the cost of XBRL software. The Netherlands office has also worked closely with stakeholders, but has not exhibited the same level of engagement as seen in the Australian case.

Both the SEC and Singapore’s ACRA provided strong incentives for businesses to use XBRL. They did this primarily through a regulatory mandate and secondarily through other mechanisms designed to reduce the cost of compliance. The SEC moved from a voluntary to mandatory approach. It did this in order to increase the benefits of reporting (i.e. as a way of avoiding penalties incurred with non-compliance). This strategy created a network effect that aimed to lower the cost of software for small and medium-sized businesses.
Singapore’s ACRA also made efforts to reduce the cost of regulatory compliance. Specifically, ACRA provided free software that could be used to compile financial information in the XBRL format and file reports online. ACRA also went through extensive consultation with businesses to improve the usefulness of the free software so as to increase its ease of use. Providing free online consultation also reduced the cost of compliance.

**Incremental Implementation Strategy**

From the very beginning, the Netherlands and Australia have taken an implementation approach that involves a wide range of governmental agencies and the entire economy. This across-the-board approach is not incremental in terms of stakeholders. Such an approach, however, poses greater risks and requires more political support and resources to sustain implementation. In terms of taxonomy development, both cases of XBRL implementation have worked through various versions. In general, the voluntary approach is not ideal for incremental targeting of a particular industry or agency. The Netherlands’ SBR Office has tried to work closely with one or two industries as a way to increase adoption.

Singapore’s ACRA has engaged several incremental implementation strategies. At first, a pilot project was implemented to test the utility of a software program and users were solicited to provide input during the course of the process. ACRA also engaged in change management. It worked closely with stakeholders to clarify the challenges associated with adopting XBRL. Thus, ACRA opted to develop and provide an online XBRL filing service on its official web site.

Providing the option of filing a partial report versus a full report is an example of incremental mandatory reporting. The SEC’s incremental, phase-in, approach is most visible in its extensive period of experimentation with voluntary participation, then switching to mandatory participation. The SEC spent over three years experimenting with a voluntary approach. It gathered input regarding the proposed mandatory rule, collecting views and reactions from stakeholders during its “notice-and-comment” period. The SEC learned about the costs and benefits of adoption from the business point of view, and began to understand the need for a network effect in adoption. Thus, the phase-in approach began with large filers, and this provided the network effect that would lower the cost of software programs.

**Outcomes**

The assessment of implementation outcomes for these four cases is rather preliminary given the relatively short history and still-evolving nature of XBRL. The assessment below draws from the information available to date on efficiency gains and improvements in transparency. In the cases of Australia and the Netherlands, the primary goal of XBRL implementation was to gain
efficiency through reducing the administrative burdens of regulatory reporting. Transparency is not listed as one of the main policy objectives for these SBR/XBRL programs. However, one can see that having business and financial data in XBRL format would improve transparency and interoperability of data across various governmental units.

One main measure of program outcome is the rate of adoption of XBRL. For Dutch implementation, the first year of reporting with XBRL only saw few participating businesses (The Dutch Taxonomy Project, 2008). The two subsequent years did see an increase in the number of businesses using XBRL, but the total number only constituted a small fraction (several percentage points) of all businesses covered.13 The Australian SBR/XBRL was officially launched for filing on July 1, 2010. There is some indication of interest in SBR/XBRL filing, at least judging by the number of Australian businesses (36,000) that has received electronic keys for filing purposes.14 The potential savings for the Australian program is estimated to be nearly $800 million once fully implemented.

For Singapore’s ACRA and the United States’ SEC, both efficiency and transparency are important goals of XBRL implementation. From the view of government, efficiency gains would stem from automating data gathering, data validation, and dissemination. The adoption of XBRL by businesses is critical to ensure efficiency gains. Given the mandatory approach, the adoption rate is close to one hundred percent for both ACRA and SEC projects. ACRA saw over 40,000 businesses reporting during its first year of implementation in 2009. Among those reporting, close to a quarter of them opted for full reporting. The SEC is also benefiting from the efficiency gains stemming from automation, particularly improved timeliness in collecting and validating data. Mandatory reporting under SEC rules has just entered the second year. Publicly traded companies have filed XBRL-formatted reports on schedule.

Transparency is important for ACRA because it allows select business information to be made available to investors. The ACRA’s XBRL implementation offers comparative business data, which helps government make public policy decisions as well as investors make investment decisions. Likewise, transparency is a top priority for the SEC because the SEC serves the public and the economy as a whole through providing quality business information to individual and organizational investors. Implementation progress can be tracked through the SEC’s Interactive Data Project, which lets users access financial data gathered in XBRL format. One immediate

13 This statement is based on an interview with the project manager of the Taxonomy Project in Netherlands in fall 2009.
14 This is based on a press release on the Australian SBR office. As of October 1, 2010, there was no official count of the number of reports filed by businesses using this new format on the same Web site.
benefit of XBRL implementation is timeliness in gathering, validating, and disseminating financial data.

**Discussions and Conclusion**

The analysis of these four cases of implementation suggests that accountability and transparency tend to be a matter of program intent. For example, the limited transparency achieved for the Netherlands and Australia cases probably stems from the emphasis on efficiency gains resulting from reducing reporting burdens. On the other hand, one of the reasons that the SEC scores high on both efficiency gain and information transparency may be due to the clear objectives driving its XBRL implementation. Moreover, a clear alignment between XBRL implementation and the agency’s core mission plays to the SEC’s advantage.

This finding suggests that public managers need to have a clear sense of goals for XBRL implementation in particular and e-government implementation in general. Making accountability and transparency a priority would help attain these program goals. This finding also underscores the necessity of better alignment of implementation goals with the core mission of the main implementing agency. The theoretical implication of this finding points toward the prominent role played by institutional constraints and the notion of path dependence, which confirms the main arguments of institutionalism, even in this new context of XBRL implementation.

A government-wide implementation requires a high level of political support and resource input due to inherent complexity and potential conflicts resulting from turf battles. Although the benefits could be large, the initial investment is substantial and must be sustained over 3-5 years to see tangible results. The challenge facing the Netherlands and Australia comes from getting and sustaining this level of support. By contrast, a single agency implementation, as in the cases of the SEC and ACRA, is relatively manageable. Thus, the managerial implication points toward the need to budget ample resources over a sustained period of time. It is also important to clearly articulate the projected returns on the resource investment, in order to sustain political and managerial support. Thus, this finding reinforces the argument for the importance of political and managerial support in successful e-government implementation, especially in a more diverse and networked setting.

These cases also show that a proper incentive scheme for adoption is key to achieving the desired outcome of e-government implementation. The SEC’s experience can be seen as a natural experiment. In this case mandatory reporting is required to provide the needed incentives for publicly traded companies to adopt XBRL. The challenge faced by Australia and the Netherlands in getting voluntary adoption also suggests the need to structure an incentive scheme to shape business adoption decisions. Public managers could learn from this experience by focusing their
effort on developing an incentive structure for businesses of all sizes. Making the use of XBRL mandatory is an effective means of tipping the cost/benefit calculation in favor of adoption. Also, another helpful strategy is to work closely with the software industry to lower development costs and thus lower service fees associated with XBRL software programs. The theoretical understanding underlying the mandatory approach points toward the limitations of using voluntary programs as policy instruments. Such a strategy would not produce the network effect necessary for generating the benefits of XBRL.

The last research finding points toward the value of the incremental strategy for successful implementation. The cases examined here confirm the need for an incremental approach. The use of pilot projects, extensive collaboration with stakeholders, and phase-in implementation are all helpful. These cases together offer public managers a rich menu of incremental implementation strategies. A public manager can choose from partial reporting to full reporting, large to small businesses, voluntary to mandatory reporting, and other strategies of incremental change. Here, the theoretical underpinning underscores the importance of change management, especially in the context of complex e-government implementation.

In conclusion, it is important to note that though this study is exploratory in nature, it does point to several opportunities for future research. Future studies can examine the extent of the long term impact of XBRL implementation in the area of efficiency gain and financial transparency. It is relatively too early to judge the performance of SBR/XBRL implementation in Australia, particularly with regard to realizing the transparency potential. Another area of future research can examine, in different contexts, the relationships between the e-government implementation factors/strategies and the outcomes mentioned above. This would increase our understanding of why and how some of the proposed strategies could be effective.
Table 1. Structural Characteristics of XBRL Implementation

<table>
<thead>
<tr>
<th>Policy Goals</th>
<th>Netherlands</th>
<th>Australia</th>
<th>Singapore</th>
<th>U.S. SEC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementation Structure</td>
<td>Efficiency and transparency</td>
<td>Efficiency</td>
<td>Efficiency and transparency</td>
<td>Transparency, efficiency, and accuracy</td>
</tr>
<tr>
<td>Reporting Compliance</td>
<td>Multiple agency covering the entire economy</td>
<td>One lead agency with collaboration from multiple ones covering the entire economy</td>
<td>Single agency covering all businesses</td>
<td>Single agency covering publicly traded companies</td>
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</tbody>
</table>

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>Implementation Structure</td>
<td>Voluntary</td>
<td>Voluntary</td>
<td>Mandatory reporting, voluntary full reporting</td>
<td>From voluntary to mandatory with phase-in</td>
</tr>
</tbody>
</table>

Table 2. XBRL Implementation Characteristics and Outcomes

<table>
<thead>
<tr>
<th>Fit to structural characteristics</th>
<th>Netherlands</th>
<th>Australia</th>
<th>Singapore’s ACRA</th>
<th>U.S. SEC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low (joint office w/ limited authority)</td>
<td>Medium (central w/ moderate authority)</td>
<td>High (one agency w/ full authority)</td>
<td>High (one agency with full authority)</td>
<td></td>
</tr>
</tbody>
</table>

| Political and managerial support | Low (lack of sustained political commitment, limited resource infusion) | Medium (political priority, resource infusion i.e. workshop etc) | High (sustained and strong political support, strong managerial commitment & resource input) | High (strong political and managerial support from the agency) |

| Incentives for adoption (cost/benefit analysis) | Low/Moderate (voluntary, limited outreach and training effort, taxonomy in place) | Low/Moderate (voluntary, significant outreach and education effort coupled with collaboration w/ the software industry) | High (regulatory compliance, free software program, attention to SMEs) | Low → High (regulatory compliance, business analytics) |

| Incremental implementation strategy | Moderate (lack of an articulated phase-in strategy) | Moderate (lack of one based on industry or essential information) | Strong (pilot, testing, change management, from partial to full reporting) | Strong (learn lessons from voluntary pilot, phase-in to drive the market and network effect) |

| Outcome: Accountability (efficiency) and transparency | Moderate efficiency, low transparency | Moderate efficiency, medium transparency | High efficiency, medium transparency | Medium efficiency, high transparency |
References


