

The Business Value of XBRL Reporting for Finnish Public Organizations

MSc program in Information and Service Management

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Abstract

Objectives of the Study

The aim of this study is to investigate the potential business value of XBRL for the main financial report receivers in Finland: Finnish Tax Administration, National board of Patents and Registration in Finland and Statistics Finland. The focus of the research is in XBRL adoption. Firstly, the current situation in these authorities regarding XBRL adoption was explored and any potential challenges in the current financial reporting process identified. Secondly, the leading European public authorities in XBRL adoption - Netherlands Tax & Customs, National Bank of Belgium and Danish Business Authority – were studied and their best practices and achieved benefits concerning XBRL investigated.

Academic Background and Methodology

The thesis is qualitative in nature and exploratory in character. First, relevant literature on the characteristics of business value of IT is reviewed. Then, the theory basis is used as a background for choosing the themes with help of which to study the business value of IT in the specific case of XBRL for the Finnish report receivers. The academic background of the thesis comes mainly from literature concerning the business value of IT: the concepts of network effects as well as quality of information were seen relevant for the purpose of this thesis. These two concepts together with a summary of the existing research on XBRL form the theoretical part of this study. In addition, a number of previously used models and frameworks that have been used in the IT business value research are reviewed. Out of these models, the Technology-Organization-Environment (TOE) framework by Tornazky et al. (1990) has been chosen as the most suitable one for the purpose of this study. Qualitative data was gathered from XBRL experts in three Finnish case organizations that receive financial reports as well as three European case organizations from the same field.

Findings and Conclusions

The findings from the empirical part of the study were discussed using the TOE framework as a lense. The concepts of “Technology”, “Organization” and “Environment” were used as explanative factors that may affect the adoption of XBRL in the Finnish case organizations. It was found that most of the potential business value resulting from the use of XBRL is related to better accessibility and understandability of the data. When the data is in a machine readable format, it is easier to disseminate and distribute among different government officials. No monetary or financial benefits from the use of XBRL were found in the research.

Keywords: XBRL, Business Value of IT, Financial Reporting, Public Authorities

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Tiivistelmä**Tutkimuksen tavoitteet**

Tutkimuksen tavoitteena on selvittää XRBL-raportointistandardin mahdollisia hyötyjä suomalaisille tilinpäätösraporttien vastaanottajille: Verohallinnolle, Patentti- ja Rekisterihallitukselle sekä Tilastokeskukselle. Tutkimus keskittyy XBRL:n käyttöönottoon. Alkuun lähtötilanne kussakin kohdeorganisaatiossa liittyen XBRL:n käyttöönottoon selvitetään sekä mahdollisia haasteita nykyisessä raportointiprosessissa tutkitaan. Nykytilannetta Suomessa verrataan hyötyihin, jotka XBRL:n käytössä edistyneemmät Eurooppalaiset raporttien vastaanottajatahot ovat saavuttaneet. Eurooppalaiset tutkimuskohteet ovat Alankomaiden Vero ja Tulli, Belgian Kansallispankki sekä ja Tanskan Yritysviranomainen.

Kirjallisuuskatsaus ja metodologia

Tutkielma on kvalitatiivinen ja luonteeltaan eksploratiivinen. Olennainen kirjallisuus liittyen informaation teknologian bisnesarvoon käydään läpi. Teoriapohjan avulla valitaan teemat, joiden pohjalta tutkitaan informaatioteknologian bisnesarvoa tässä erityistilanteessa, eli XBRL:n käyttöönotossa suomalaisille raporttien vastaanottajatahoille. Akateeminen taustatutkimus työlle koostuu informaatioteknologian bisnesarvoon liittyvästä kirjallisuudesta – lisäksi verkostovaikutusten sekä tiedon laadun teorit nähtiin olennaisina tutkimukselle. Nämä teoriat yhdessä olemassa olevan XBRL-kirjallisuuden kanssa muodostavat tutkimuksen akateemisen pohjan. Lisäksi useita aiemmin informaatioteknologian bisnesarvon tutkimuksessa käytettyjä viitekehykset esitellään ja niistä tähän tutkimukseen sopivin, Tornazkyn ja Fletcherin (1990) Teknologia-Organisaatio-Ympäristö –kehys (TOE) valitaan. Kvalitatiivinen tutkimusdata kerättiin XBRL-asiantuntijoilta kolmessa suomalaisessa raportteja vastaanottavasta kohdeorganisaatiossa sekä kolmelta vastaavassa Eurooppalaisesta taholta.

Tulokset ja päätelmät

Empiirisen osuuden löydöksiä analysoidaan käyttäen TOE-viitekehystä. “Teknologia”, “Organisaatio” sekä “Ympäristö” ovat selittäviä tekijöitä, jotka voivat vaikuttaa XBRL:n käyttöönottoon Suomessa. Kävi ilmi, että suurin mahdollinen bisnehyöty suomalaisille raporttien vastaanottajille kumpuaa datan helpommasta tavoitettavuudesta sekä ymmärryksestä. Koneellisesti luettava data on myös helpompi luokitella ja jakaa eri julkishallinnon tahojen kesken. XBRL:n käyttöönotosta syntyviä rahallisia tai taloudellisia hyötyjä ei havaittu tässä tutkimuksessa.

Avainsanat: XBRL, Business Value of IT, Financial Reporting, Public Authorities

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1 Introduction

This introductory chapter will cover the main objective, aims and research problems of the thesis. First, the background motivation for choosing XBRL as a topic and the research questions will be presented. Then, a short introduction of the Real-Time Economy Program, of which this thesis project is a part of, will be given. Finally, the methods and structure of the work will be briefly discussed.

1.1 Background of the Study

XBRL, eXtensive Business Reporting Language, is the open international standard for business reporting, managed by a global non-profit consortium, XBRL International. XBRL is an XML (eXtensible Markup Language) based standard of which the aim is to facilitate the preparation, publishing, exchange and analysis of financial statements and the information they contain (XBRL 2003). By using unique tags associated with reported facts, XBRL makes reporting more accurate and more efficient. Because the information in reports prepared using the XBRL standard is interchangeable between different information systems, also the exchange of business information becomes easier across reporting chains (XBRL: www.XBRL.org).

Despite almost 15 years of XBRL history and many studies already conducted around the topic, XBRL still remains an interesting field of research, growing together with the usage of the standard. The Australian Prudential Regulatory Authority (APRA) has used XBRL for regulatory reporting since September 2001 and UK Inland Revenue has accepted company accounts and computations in XBRL format since November 2005 (Baldwin, Brown, Trinkle 2006). In the USA, XBRL was first proposed in 2005 by the Securities and Exchange Commission of USA (SEC) as a voluntary program: the registrants were given the possibility to file their financial reports in XBRL format instead of using the old EDGAR (Electronic Data Gathering, Analysis and Retrieval) system. After the successful results from the trial, SEC released a mandate for XBRL adoption on January 30, 2009 (Fang 2013).

The most advanced countries in terms of XBRL use and adoption are Australia, China and Netherlands – the latter one being the pioneer out of the three, where it was found that the demand by the government from the typical firm of some 200 000 pieces of information including taxation, accounting and human resources issues could be reduced to only 8000

unique pieces reported by once using XBRL (Alles 2009). It is interesting that Finland, the leading European country in investments to science and technology innovations (Eurostat 2013), is still somewhat behind with the adoption of XBRL. By 2015, only a fairly small amount of Finnish organizations use XBRL in some parts of their reporting and none of them has totally replaced old reporting methods and systems with XBRL. However, good conditions exist in Finland for a larger scale adoption of XBRL in the near future. As an EU level mandate for XBRL use is also being planned to become effective on 1.1.2018, there is interest and a strong motivation for doing research in the field in Finland.

1.2 Purpose of the Study and Research Questions

The aim of this study is to investigate the potential business value of XBRL for the main financial report receivers in Finland: Finnish Tax Administration, National board of Patents and Registration in Finland and Statistics Finland. The focus of the research is in XBRL adoption. Firstly, the current situation in these authorities regarding XBRL adoption will be explored and any potential challenges in the current financial reporting process identified. Secondly, the leading European public authorities in XBRL adoption - Netherlands Tax & Customs, National Bank of Belgium and Danish Business Authority – will be studied and their best practices and achieved benefits concerning XBRL investigated.

The following questions have been formed to guide the research:

- What is the potential business value of the structured XBRL reporting language for the Finnish report receivers?
 - What are the existing challenges in the financial reporting processes in Finland and how can the XBRL standard address them?
 - What benefits can the Finnish report receivers expect from XBRL based on what has been already achieved in other European countries?

The main focus of the study will be in the empirical part, concentrating on the potential business value of XBRL for the Finnish report receivers. “Lessons learned” from the more advanced European countries already widely using XBRL will be used as benchmarks to predict future benefits for Finland. Although XBRL is a new innovation and thus existing theories may not completely apply, previous XBRL literature and research will be used as

background for the empirical part as well as the existing ISS theories concerning the adoption of new technologies and the business value of IT.

1.3 Real-Time Economy Program

The thesis project is a part of the Real-Time Economy program, a collaboration between Tieto, Aditro and Aalto University School of Business. Real-Time Economy is an environment where all the transactions between business parties are in digital format, increasingly automatically generated, and completed in real-time both from business and IT-processing perspectives. A paperless, real-time economy environment enables the move towards electronic filing and bookkeeping as well as automated accounting, benefiting the society both in terms of productivity and the environment. (Aalto RTE, 2012b.)

The objectives of the Real-Time Economy program at Aalto include research, teaching, public influence and business projects. XBRL is an important part of the RTE program and relates directly to one of the goals of the program, with its purpose of encouraging companies to digitalize their financial reporting by using the XBRL format. Four theses have already been written at Aalto University School of Business on XBRL (Suosalo, 2013; Lindfors, 2012; Asatiani, 2012 and Norovuori, 2012). This thesis will be a continuum to the study conducted from the financial report receivers' perspective by Asatiani (2012). Three years ago, Asatiani was investigating the potential business value of XBRL reporting for the main public authorities that receive financial reports in Finland, in an environment where XBRL had not been used neither mandatorily nor voluntarily in any form except for some small scale experiments. This thesis will be an update on the same question with the added value and insight from the European XBRL pioneers in Netherlands, Denmark and Belgium.

1.4 Method and Structure of the Thesis

The thesis is qualitative in nature and exploratory in character. First, relevant literature on the characteristics of business value of IT will be reviewed. The theory basis will be used as a background for choosing the themes with help of which to study the business value of IT in the specific case of XBRL for the Finnish report receivers. A qualitative approach is chosen for the phenomenon of which only a little is known (Strauss & Corbin, 1990, 19-23).

Moreover, a multiple, two-fold case study is conducted to study the phenomenon of which the concepts and variables are not easily quantifiable (Ghuri & Gronhaug, 2002, 171). The next chapter after introduction will review the basic concepts of XBRL and explain its relation to the financial report receivers. The third chapter will present the literature review whereas the fourth will concentrate on the theoretical framework.

The empirical part of the thesis is a multiple case study. Chapter 5 will present the research methodology and chapters 6, 7 and 8 will concentrate on the findings, discussion and conclusions of the qualitative interviews consequently. The first part of the empiria concentrates on the Finnish report receivers and aims to find out the current status and related problems of the financial reporting process for the Finnish public authorities. The second part concerns the more advanced European report receivers already successfully using XBRL. The goal of the second part of the case studies is to identify the benefits from XBRL reporting already realized and also recognize the potential challenges in the implementation of XBRL. Together these two case studies will answer to the initial research question: What is the potential business value of the structured XBRL reporting language for the Finnish report receivers?

1.5 Terminology

XBRL (eXtensible Business Reporting Language) is a markup language, derived from XML (eXtensible Markup Language), that is used to label or “tag” information within financial statements. XBRL items are classified according to a given taxonomy, which defines and structures how each tagged financial statement item or disclosure relates to a set of reporting concepts. (Vasarhelyi, Chan, Krahel 2012)

Business Value of IT is defined as the organizational performance impacts of information technology at both the intermediate process level and the organization wide level and comprising both efficiency impacts and competitive impacts (Melville, Kraemer, Gurbaxani 2004).

Financial Report Receivers are users of the data from financial reports. This could mean a wide range and different types of organizations - in the context of this thesis, however, the following public authorities are concerned: Finnish Tax Administration, National board of Patents and Registration in Finland and Statistics Finland as well as Netherlands Tax &

Customs, National Bank of Belgium and Danish Business Authority. These authorities act as regulators in the information supply chain. (Baldwin, Brown, Trinkle 2006)

2 XBRL and Financial Report Receivers

This chapter will first go through the basic concepts and functionalities of XBRL as a technology. Also the purposes and potential benefits of XBRL will be discussed. Then, the role of the financial report receivers in the information supply chain and their relations to XBRL in Finland and the other European countries will be explained.

2.1 Basics of XBRL

XBRL is an open international standard for business reporting, a language in which reporting terms can be authoritatively defined. These terms can then be used to uniquely represent the contents of financial statements or other kinds of compliance, performance and business reports, making reporting more accurate and more efficient. (XBRL: www.XBRL.org). XBRL is a framework for simplifying the exchange of business information between software programs, enabling financial information to be easily extracted, exchanged, analyzed and processed by different kinds of systems regardless of the original instances such as accounting programs that generated the data. (Hannon 2005).

XBRL is used in more than 50 countries in the world and is managed by the global not for profit consortium, XBRL International. The consortium comprises over 600 companies and agencies around the world with the intention to develop the language further and promote its adoption (XBRL: www.XBRL.org). Technologically, XBRL is a computer language that belongs to the family of XML (eXtensible Mark-up Language), allowing financial information to be tagged and subsequently stored and retrieved from any financial database.

XBRL documents are created by tagging financial statement information with XBRL codes. As a result, the data is made computer readable and searchable. The process starts by selecting the suitable XBRL technical definition, which is then used as basis for the tagging, where elements from XBRL taxonomies are associated with items from financial statements. The tagging process produces an “instance document” which includes the financial facts of a

company with associated taxonomy definitions. The instance document is then combined with another computer file, the “style sheet” to produce a printable, “rendered document”, which can be treated as the final output from the process. (Plumlee & Plumlee 2008). Figure 1 presents the process of creating an XBRL document.

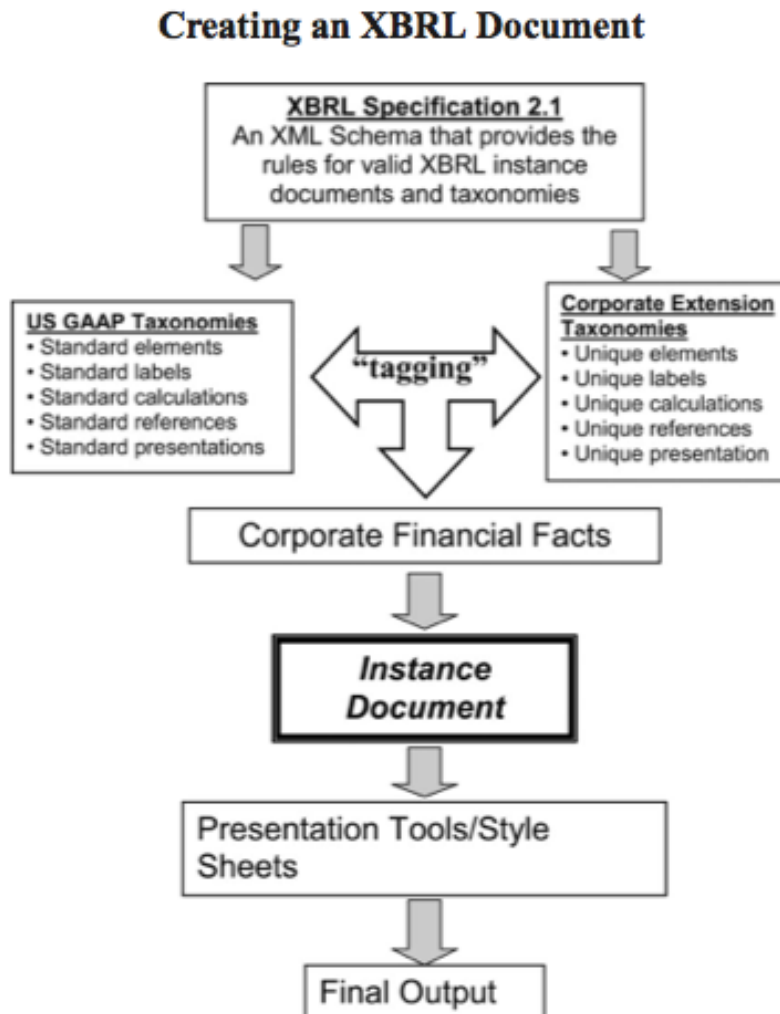


Figure 1. Creating an XBRL Document (Plumlee & Plumlee 2008)

A wide range of academic studies have been conducted to study the potential impacts and benefits of XBRL adoption. It is suggested that XBRL will simplify disclosure and facilitate the communication of financial information via Internet to users, analysts and regulators (Baldwin, Brown, Trinkle 2006). As XBRL and related technologies evolve, the quality and clarity of financial reporting information will improve, increasing the usefulness of financial data (Vasarhelyi, Chan, Krahel 2012). Altogether, XBRL will positively impact the accuracy, efficiency and transparency in financial reporting (Farewell & Pinsker 2005) through

increased quality, quantity and standardization of financial information (Baldwin, Brown, Trinkle 2006).

Brown and Trinkle (2011) used the Delphi method to study the potential future impacts of adopting the XBRL standard. Based on the study, the greatest potential XBRL impacts to investors, corporations and regulatory bodies can be divided into four different categories: 1. Corporate & Compliance, 2. Financial Reporting, 3. Users of Financial Reports and 4. Auditing. The results of the study suggest the most likely impacts of XBRL to include: increased accessibility of financial reports, easier regulatory compliance, enhanced availability of financial reports, facilitation of continuous reporting and improved efficiency in investment and business decision making. (Brown & Trinkle 2011). For the purpose of this thesis, the third group – users – is of special interest. The Figure 2 summarizes the likely impacts of XBRL according to Brown & Trinkle's Delphi panel study.

Corporation and Compliance

- XBRL increases the efficiency of business decision making.
- XBRL allows for easier regulatory compliance.

Financial Reporting

- XBRL facilitates continuous reporting.
- XBRL enhances the availability of financial reports.
- XBRL eliminates the need for convergence of generally accepted accounting principles.

Users of Financial Reports

- XBRL provides more accessible financial reports to users.
- XBRL increases the use of un-audited information by investors.
- XBRL increases the ability of financial analysts to perform cross-sectional analysis within industries.
- XBRL allows more efficient investment decisions by users of financial reports.

Audit

- XBRL facilitates continuous auditing.

Figure 2. Framework of likely XBRL impacts (Brown & Trinkle 2011)

2.2 XBRL and the Information Supply Chain

Different types of users will benefit from the adoption and usage of XBRL in the information supply chain. To facilitate the understanding of the effects of XBRL, Baldwin, Brown and Trinkle classify the parties impacted by the technology adoption into four different roles: Systematizers, Providers, Intermediaries and Users.

The first group, systematizers, include for example XBRL taxonomers, researchers and system developers such as Microsoft. As the use of XBRL requires a deep understanding and

application of the existing accounting standards, the use of the standard may expose weaknesses and contradictions in these. Second, XBRL providers include organizations and individuals as well as software systems and subsystems. In the specific case of banks, for example, XBRL can improve the efficiency of banking operations while also reducing the cost associated with data collection and processing with help of automation. Third, the intermediaries consist of mainly auditors and financial publishers. It is likely that XBRL will change the whole audit process and help institutionalizing continuous monitoring and reporting processes in organizations. Finally, XBRL users can be managers, analysts, investors, creditors and regulators for example. On the first hand, XBRL will provide better information for investors and analysts through the Internet. On the other hand, regulators will be capable of more timely and accurate disclosure and analysis of filings. (Baldwin, Brown, Trinkle 2006). The four different roles in the information supply chain are illustrated in Figure 3.

Roles	Description of Roles
Systematizers	<ul style="list-style-type: none"> • XBRL taxonomers: XBRL Consortium • Accounting standard setters: FASB, IASC, etc. • Legislators and regulators: FDIC, SEC, etc. in their role of determining what information should be collected. • System developers: Microsoft, SAP, etc. • Researchers: ontologists
Providers	<ul style="list-style-type: none"> • Organizations and individuals <ul style="list-style-type: none"> ◦ Companies, divisions, subsidiaries ◦ Governments and governmental units: Oregon, U.S. Army, etc. ◦ Not-for-profits: United Way, etc. • Software systems and subsystems
Intermediaries	<ul style="list-style-type: none"> • Auditors and others who review and express opinions regarding financial information. • Financial Publishers: structure, aggregate, archive, and provide access to business data from a variety of sources. <ul style="list-style-type: none"> ◦ Aggregators: Collections of information, databases. Edgar Online etc. ◦ Statisticians: Industry averages, quartiles etc. Dun and Bradstreet etc. ◦ Publishers: Financial news. Wall Street Journal, Business Week etc.
Users	<ul style="list-style-type: none"> • Analysts • Investors: individual investors, mutual funds, pension funds etc. • Creditors: banks, companies selling on credit, etc. • Regulators: in their role of reviewing the information provided • Managers • Researchers

Figure 3. Information Supply Chain Roles (Baldwin, Brown, Trinkle 2006)

As Figure 3. illustrates, financial report receivers are the users of XBRL in their role of regulators, reviewing the information provided. In the specific case of this thesis, the main three Finnish public authorities who receive financial reports are concerned: Finnish Tax Administration, National Board of Patents and Registration in Finland and Statistics Finland. Receiving financial reports is a regular, core process for all of these three organizations, and thus the implementation of XBRL has the potential to impact these organizations deeply. The three European report receivers concerned in this thesis are Netherlands Tax & Customs, National Bank of Belgium and Danish Business Authority. Likewise to the Finnish report receivers mentioned above, also these three organizations receive regularly large masses of financial reports, making the processing of these documents a major part of the organizations' operations. In contrast to the Finnish authorities, however, the European counterparts are much more advanced what comes to the adoption and use of XBRL. The chosen European report receivers can thus be used as benchmarks on predicting the future of XBRL for the Finnish authorities.

3 Literature Review

In this chapter, the relevant literature concerning the research topic will be reviewed and analyzed in order to build a framework for the specific context of this study. First, the most important theoretical streams related to business value of technology will be presented and summarized. Then, a brief overview of the frameworks already proposed in this context will be given. Out of the existing frameworks, the most applicable one is chosen and then further modified to suit this specific study.

3.1 Business Value of Technology

IT business value research examines the organizational performance impacts of information technology. Despite its importance, the topic still remains uncertain, diversely conceptualized and widely debated among researchers. Countless approaches have been adopted to understand the magnitude and generation of IT business value. (Melville, Kraemer, Gurbaxani 2004). While some researchers have associated large productivity improvements and consumer benefits to IT, others cannot identify any impact from IT on the bottom line performance of a business (Hitt & Brynjolfsson 1996). At least two significant limitations can be identified in the past studies. First, IT is often treated as a single factor despite of its complexity: often some systems may be effective even though others may bring negative returns. Second, many studies use either cross-sectional or short-time series data instead of assessing the impact on a prolonged time period. (Mukhopadhuay, Kekre, Kalathur 1995).

A study based on 66 firm-level empirical studies between 1990 and 2000 by Kohli & Devaraj (2003) examines the structural variables that affect IT payoff and may result in contradicting views on its effect on firm profitability. Kohli & Devaraj divide the past IT payoff literature into three different categories, answering the questions *what*, *how* and *where* IT payoff is measured. Studies addressing the first question, “what”, are concerned with traditional

measuring of variables, including those of productivity and profitability. The second type of studies describe how the data are gathered, concentrating on the duration of studies, sample size and number of data points. The third question, “where” measurements for IT payoffs should occur, is answered by studies that make the difference between industries as well as between different levels of studies (firm and industry). The results suggest that the influencing factors on the likelihood of a certain study, finding greater improvements on firm performance, are sample size, data source and the industry in which the study is conducted. Figure 4 illustrates the different variables affecting the relationship between IT investment and firm performance. (Kohli & Devaraj 2003).

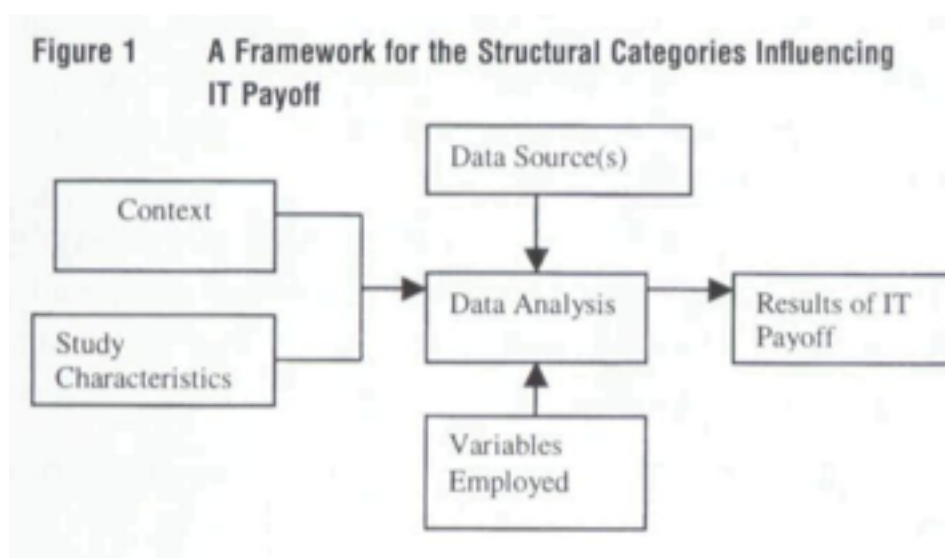


Figure 4. Variables affecting IT payoff (Kohli & Devaraj 2003)

Melville, Kraemer & Gurbaxani (2004) propose a modified classification of information technology based on Orlikowski & Iacono’s (2001) framework. This classification sheds light on the above-mentioned different conceptualizations of the IT artifact, that may result in diverse understandings of the topic. The framework originally proposed by Orlikowski & Iacono (2001) presents five different ways of viewing the technology artifact: 1. Tool View of Technology, 2. Proxy View of Technology, 3. Ensemble View of Technology, 4. Computational view of Technology and 5. Nominal View of Technology. The Computational View of Technology has been omitted from the later conceptualization by Melville, Kraemer & Gurbaxani (2004) because it is not applicable to IT business value research as its focus is mostly on system development and testing as well as data modeling and simulation rather

than business value. The remaining four different conceptualizations and their descriptions are presented in Figure 5.

Table 1. IT Artifact Conceptualizations Used in IT Business Value Research*	
Tool	IT is a tool intended to generate value, whether productivity enhancement, cost reduction, competitive advantage, improved supplier relationships, etc. Specific intention for IT is often unknown. Studies of specific system and implementation contexts enable examination of tool view assumptions.
Proxy	IT is operationalized via proxies such as capital stock denominated in dollars. Wide range of potential proxies exists, but few have been adopted. Adoption of diverse proxies enables triangulation and enhances accumulated knowledge.
Ensemble	Assessment of IT business value generation in rich contexts, often using case or field studies. Organizational structure and co-innovations such as workplace practices may be included as moderators or mediators of value.
Nominal	IT is not conceptualized and appears in name but not in fact. Abstraction enables model precision at the expense of generality.

Figure 5. The IT Artifact Conceptualizations in IT Business Value Research (Melville et al. 2004)

First, in the Tool View of Technology, the specific intention of IT is often unknown and the main point of interest remains in its ability to create value and enhance factors such as productivity or competitive advantage. Second, the Proxy View often measures the value of IT in monetary terms, emphasizing individual perceptions of its usefulness. Third, the Ensemble View focuses on case studies examining IT business value in specific organizations. Finally, the fourth, Nominal View of Technology, “Technology as an Absent”, recognizes technology in name but not in fact, concentrating rather on the impact of IT than IT itself. (Melville et al. 2004).

After understanding what is meant by information technology and what are the different viewpoints related to research on the field, the relationship of IT with “value” must be acknowledged. Also, in order to investigate IT business value, a clear and meaningful definition has to first be developed to cover the absence of one in the past literature. Cronk & Fitzgerald define IS business value as “the sustainable value added to the business by IS, either collectively or by individual systems, considered from an organizational perspective, relative to the resource expenditure required”. Cronk and Fitzgerald (1999) propose a framework for understanding IS business value, illuminating the differences and similarities

in existing evaluation methods and suggesting dimensions for IS business value as well as explaining what aspects of value are included in each method chosen. Figure 6 represents the different dimensions of IS business value according to Cronk & Fitzgerald.

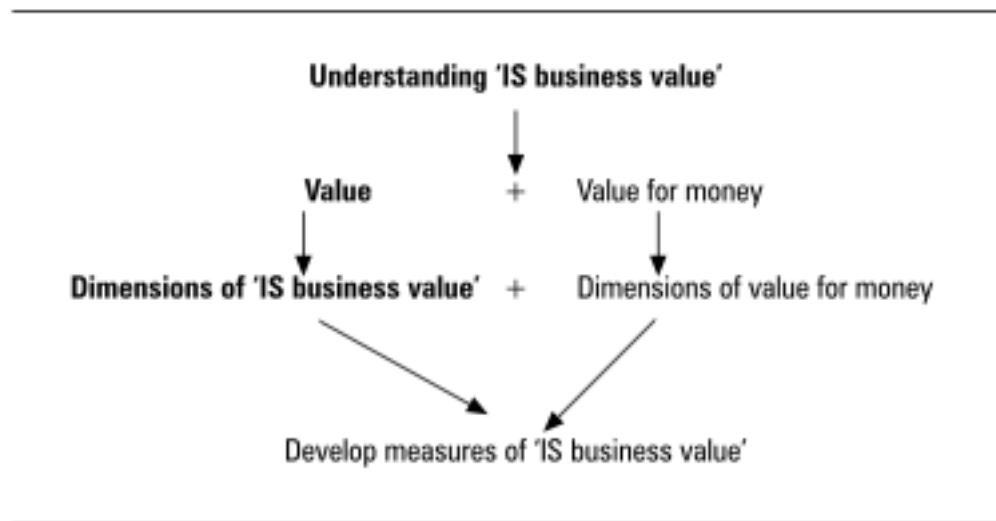


Figure 6. Understanding IS Business Value (Cronk & Fitzgerald 1999)

The three dimensions of IS business value are named “system dependent”, “user dependent” and “business dependent” dimension accordingly. The system dependent dimension refers to value that is added to the organization by the system characteristics and is measured by for example timeliness and accuracy, whereas the user dependent dimension concerns value that is added by users and is reflected in either effective or ineffective use of the system. The business dependent dimension, then again, implies value-add to the organization that results from business factors such as alignment between systems and business goals, impacting the realization of business goals accordingly. Together, the three dimensions of IS value can be illustrated by a four-sided prism, where each dimension is represented by one face of the prism and where conceptual factors form the base. The final form and volume of the prism is defined by the interaction of the different faces, together resulting in a holistic model of “IS business value”. (Cronk & Fitzgerald 1999). Figure 7 illustrates the prism.

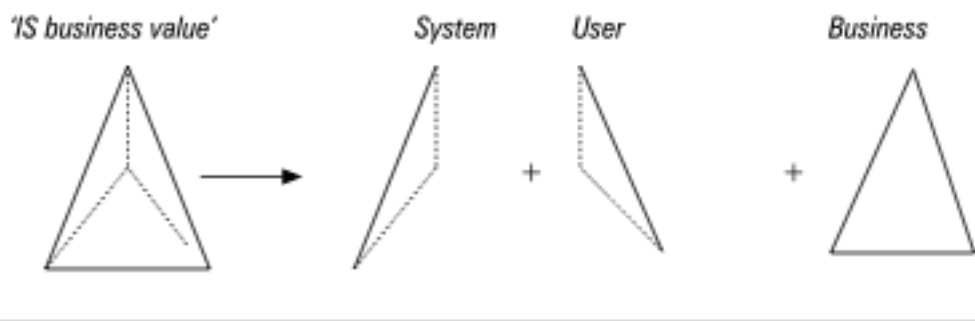


Figure 7. The four-sided prism of IS business value (Cronk & Fitzgerald 1999)

In advanced economies, productivity growth depends on technological innovation as well as the organizational changes enabled by technological innovation (Brynjolfsson & Hitt 2003). Regardless of the contradicting views of researchers on the business value of IT, a notable amount of previous research has shown that information technology may be an improving factor related to organizational performance (Hitt & Brynjolfsson 1996; Brynjolfsson & Hitt 2003; Kohli & Devaraj 2003). To better understand the potential value of the IT artifact on organizational performance, Hitt & Brynjolfsson (1996) propose three different measures of information technology value: productivity, business profitability and consumer surplus. Although these three measures are related, it needs to be noted that ultimately they must be addressed as separate questions and thus the value of IT may look different depending on the vantage point chosen.

Hitt & Brynjolfsson's discussion and empirical analysis suggest that while it is possible for firms to achieve productivity benefits from effective IT management, it does not automatically translate into higher profits. In other words, IT investments are necessary for maintaining competitive advantage, but not necessarily for building it. (Hitt & Brynjolfsson 1996). Another study by Brynjolfsson & Hitt (2003) explores the effect of computerization on firm productivity, suggesting that computerization indeed contributes to productivity and output growth as it is measured conventionally in a broad cross-selection of large firms. Another implication of the study is that greater output contributions from computerization accrue only over time – on a shorter time period, in contrast, computers contribute only to output growth but not to productivity growth. (Brynjolfsson & Hitt 2003).

The above chapters describe some of the diverse conceptualizations and differing views of researchers on the business value of IT in general. The goal of the chapter was to provide an

understanding of the vastness of the topic and give an idea of the numerous different research branches that could be followed in this study field. The next two chapters will concentrate on more specific topics related to the theme that were present in many of the academic articles reviewed and also relate to the potential business value of XBRL; network effects and quality of information namely.

3.2 Network Effects

Network effects or network externalities appear in multiple academic articles related to the business value of IT and are thus an important concept to understand when evaluating the value of a technology also in the context of this study. XBRL is clearly a network technology and thus the concept is important also from the specific point of view of this thesis.

A series of articles by Katz & Shapiro (1985, 1986, 1994) provide a holistic description on network effects in general. Moreover, Zhu, Kraemer, Gurbaxani & Xu (2006) study the topic in the specific context of using interorganizational systems (IOS). Network effects are the benefits for the users of a certain product that increase or only occur when there are multiple users in a network. For example in the case of a telephone, the individual user is likely to experience only a little value of using a telephone alone – yet he or she can find a telephone to be a highly beneficial product when multiple other households or businesses have joined the network of telephone users. Network effects are supported by Metcalfe’s law, which suggests that the utility of a network is the square of the number of users (Lai, Wang, Chang-Tseh, Jeng-Chung 2007).

Network externalities can be generated through several possible sources – one way to distinguish is to divide the sources into either direct or indirect effects. An example of direct effects is the one of the telephone explained in the above chapter: the consumption externalities are generated through the direct physical effect of the number of purchasers on the quality of a product. Indirect network effects, then again, arise when for example an agent purchases a personal computer and is concerned with the number of other agents purchasing similar hardware due to the fact that the amount and variety of the software will increase as the number of hardware units sold increases. (Katz & Shapiro 1985).

Another way to classify network externalities is to make the division into positive or negative. Positive network externalities occur when a user’s utility for a product or service

increases when the number of users with and identical or compatible product increases. Negative externalities, in contrast, occur when the utility of a user decreases while the number of agents using the same product or service increases. The telephone example from the first chapter can be used to illustrate both positive and negative network externalities. In the first hand, positive network externalities appear when the utility of a telephone user increases when more users join the network. On the other hand, an overloaded telephone network affects an individual user negatively. (Lai, Wang, Chang-Tseh, Jeng-Chung 2007).

One final way for categorizing network effects is into horizontal or vertical peer externalities: vertical partners and horizontal peers. In general, the size of a network grows when two types of firms join it – vertical partners either upstream or downstream in the supply chain and horizontal peers at the same level of the supply chain. In the specific case for open-standard IOS systems, Zhu et. Al (2006) suggest that open standard network effects will grow as more trading partners and peers support and adopt the new open-standard IOS. (Zhu, Kraemer, Gurbaxani, Xu 2006). In the specific case of IOS systems for financial reporting, like XBRL, the vertical actors would be for example regulators and customers, both also interacting with their horizontal peers.

According to Eierle, Ojala & Penttinen (2014), XBRL is a typical example of a technology that enjoys significant network effects, both direct and indirect ones. An example of direct network effects derived from XBRL is the positive impact that the number of adopters of the electronic government reporting has on the benefits for the individual adopter, who is able to exchange the documents with a larger number of business partners consequently. An illustration of indirect network effects, then again, would be the increasing amount of compatible hardware and software solutions as the popularity of the standard increases. (Eierle et al. 2014).

3.3 Quality of Information

In an information economy, the identification and management of corporate information has become a crucial part of business. However, the availability of information is not anymore a strategic advantage – the quality of information is. The quality of information available is a serious concern and using it uncritically is risky, since poor quality of information often is linked to lost productivity and a failed enterprise. (Bovee, Srivastava, Mak 2003).

As the availability of information is not the main concern anymore, but the quality of it is, the ability to quickly define and assess information quality for decision-making can provide a strategic advantage. Despite the value and importance of the quality of information, it is often variably defined or even ignored in many contexts. Bovee et al. (2003) provide a model consisting of four attributes to assess information quality: “Accessibility”, “Interpretability”, “Relevance” and “Credibility”. In this model, “Credibility” can be evaluated with help of four attributes: “Accuracy”, “Completeness”, “Consistency” and “Non-fictitiousness”. Figure 8 illustrates Bovee et al.’s model for assessing information quality.

Criteria		Basic Description
A	Accessibility	Ability to retrieve information
I	Interpretability	Understandability and meaningfulness of information to the user
R	Relevance	Applicability of information to the user's domain and purpose of interest
C	Credibility	Degree of belief assigned by the user to information based on whether intrinsic attributes of Accuracy, Completeness, Consistency and Non-fictitiousness are met

Figure 8. Basic Aspects of Information Quality (Bovee, Srivastava, Mak 2003)

According to Bovee et al.’s model, to determine the fitness of the available information for our use – the quality of information – we must first be able to find information that we might find useful (Accessibility); second, we must be able to understand and find a meaning in it (Interpretability), third, the information must be applicable to our domain and purpose of interest (Relevance) and finally, we must believe the information to be credible (Credibility). (Bovee et al. 2003).

XBRL can be seen to improve almost all if not all the aspects of information quality defined by Bovee et al. (2003). According to Pinsker & Li (2003), using XBRL results in improved accessibility, interoperability and efficiency, potentially yielding also significant cost and time savings for the adopting organizations. Baldwin, Brown and Trinkle (2006), then again, state that the use of XBRL tagging results in increased quality, quantity and standardization

of available financial information. Moreover, it may also provide wider access to financial information and facilitate more meaningful comparisons of company financial data (Baldwin et al. 2006).

Baldwin, Brown and Trinkle (2006) have developed another model for assessing the quality of information especially in the context of XBRL with five different characteristics: “Consistency and Comparability”, “Reliability and Accessibility”, “Relevance”, “Decision Usefulness” and “Transparency”. This model has many similarities with the above presented framework from Bovee, Srivastava and Mak (2013). Accessibility in Bovee et al.’s model refers to the ability to retrieve information for further use. In Baldwin et al.’s framework, “Accessibility” is also one of the main characteristics of XBRL as it allows the automatic transmission of data from one system to another, making the content more accessible to decision makers when it is directly interpreted by computers. Moreover, XBRL facilitates the use of intelligent agents to gather and process financial information (Baldwin et al. 2003).

Interpretability according to Bovee et al., then again, relates to the understandability and meaningfulness of the information to the user whereas relevance relates to the applicability of information to the user’s domain and purpose of interest. Both Bovee’s interpretability and relevance can be assimilated with “Relevance” in Baldwin’s model: XBRL-tagged reports will enable decision makers to acquire the data they need and to easily display in a preferred format. Data can also be made available in real-time, providing decision makers with faster access to meaningful data, a possibility for automating processes, leading to better decisions.

Finally, Bovee et al.’s credibility, the degree of belief assigned to the user to the information, can be related at least to Baldwin et al.’s “Decision usefulness”, “Transparency” and “Reliability”. Decision useful data is such data that is appropriately formatted, accurate, relevant, and timely: XBRL formatted data are efficiently and effectively retrievable, searchable and analyzable. Moreover, this data enhances transparency, as it is clearly defined and thus easier to understand and interpret. Also, the data is highly accurate and reliable as it is web-based and can be directly interpreted by computers. (Baldwin et al. 2006). Figure 9 illustrates the attributes of the quality of information and their relationship with XBRL in Baldwin, Brown and Trinkle’s (2006) model.

Characteristic	XBRL Improvements/Challenges
Consistency and Comparability	<ul style="list-style-type: none"> • Clarification of inconsistent use of terminology, both homonyms and synonyms • Easier to determine consistency among firms and across time periods • Conversion among different forms of GAAP (e.g., U.S. GAAP versus IAS) easier • Clear mapping of elements
Reliability and Accessibility	<ul style="list-style-type: none"> • Reduction of errors introduced by re-keying information • Sheer complexity of taxonomies may introduce errors in creating or reading data • Less likely to miss needed information • Facilitates automation and use of intelligent agents • Requires additional learning to understand complex taxonomies and extensions
Relevance	<ul style="list-style-type: none"> • Automation facilitates making information available on a more timely basis, increasing the likelihood it will be available when needed • Easier to automatically select information needed • Streamlines sharing of information among disparate technology, thus can use best information rather than what is available in a particular technology
Decision Usefulness	<ul style="list-style-type: none"> • More accessible, clear, consistent, comparable, and reliable information available when needed to make decisions • Even if there is no change in the decision usefulness of information per se, information will be easier to get and use
Transparency	<ul style="list-style-type: none"> • Crisp clear definitions make information easier to understand • Information easier to manipulate and analyze • Extra layer of software needed for creation and interpretation of information

Figure 9. Quality of Information (Baldwin, Brown, Trinkle 2006)

3.4 IT Business Value Models

As the above chapters suggest, the numerous approaches to understanding business value of IT are very different from each other and often also contradictory. Consequently, an almost equally large number of frameworks has been applied to the research on the topic.

Melville, Kraemer & Gurbaxani (2004) propose a resource-based view for understanding the IT business value which emphasizes heterogeneous firm resource endowments as a basis for competitive advantage and can thus be used as an efficient tool for analyzing the relationship between IT and competitive advantage. In previous literature, the resource-based view has been used to examine the efficiency and competitive advantage effects of specific firm resources, culture and organizational routines. A limitation for the framework in question is that it does not specify how the examined resources are being used but rather just assumed that they are always applied in their best uses. (Melville et al. 2004)

The IT business value model built by Melville et al. bases on a review of previous approaches and IT business value models used in studying the topic. The findings from this analysis suggest that “if the right IT is applied within the right business process, improved processes

and organizational performance result, conditional upon appropriate complementary investments in workplace practices and organizational structure and shaped by the competitive environment”. In Melville, Kraemer & Gurbaxani’s IT business value model, the heart of value generation is the “focal firm”, the organization that invests in and deploys IT resources. In addition to the focal firm, also external factors such as the competitive environment and the macro environment play a role in IT business value generation. Thus, a three-domain model is derived, which consists of 1. the focal firm, 2. the competitive environment and 3. macro environment. (Melville, Kraemer, Gurbaxani 2004). Figure 10. illustrates the IT business value model.

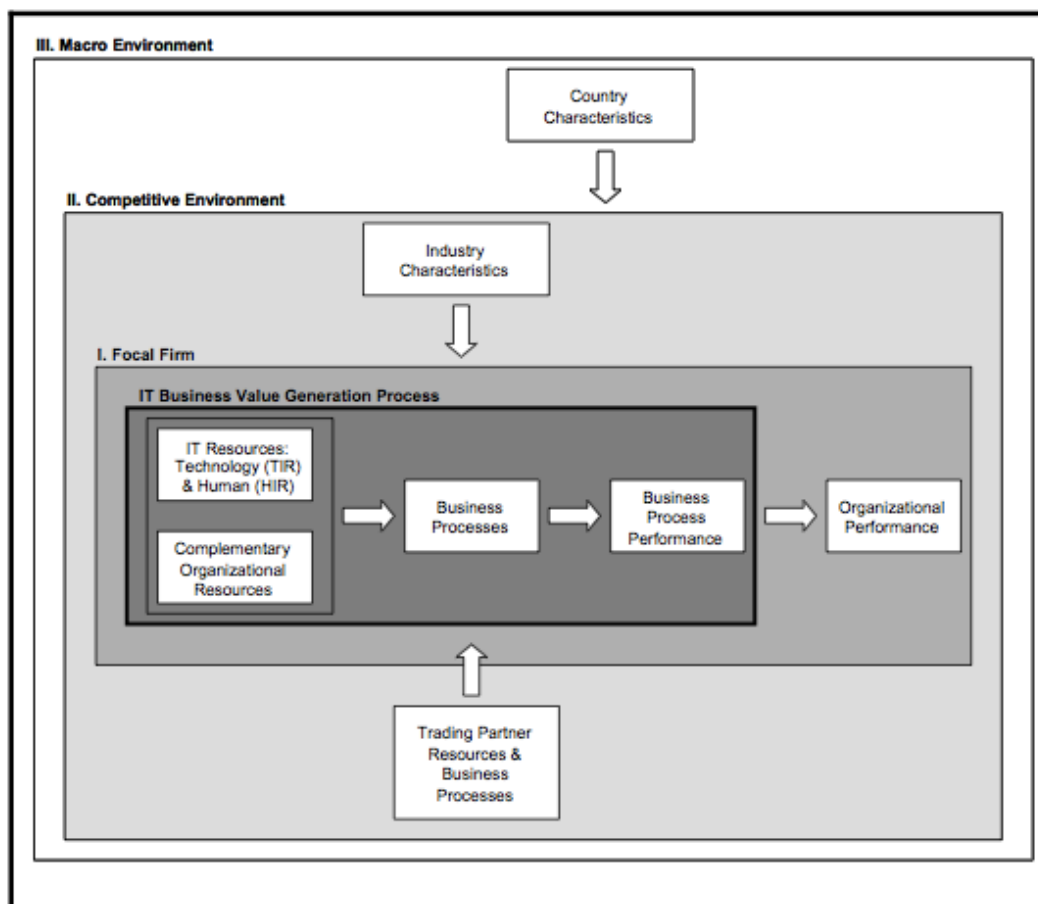


Figure 10. IT Business Value Model (Melville, Kraemer & Gurbaxani 2004)

Within the focal firm – which consists of the IT resource, complementary organizational resources, business processes and their performance as well as organizational performance – IT business value is generated by the deployment of IT and related resources and processes. The impact to organizational performance results from improved or new business processes, generated by application of IT. The focal firm operates in a competitive environment that can

be still separated into two distinct components that both play a role in generating business value: trading partners and industry characteristics such as competitiveness, regulation and technological change. Finally, the macro environment has an effect on IT business value generation as it includes country- and meta-country specific characteristics that affect IT application for the improvement of organizational performance. (Melville, Kraemer, Gurbaxani 2004)

Tallon, Kraemer & Gurbaxani (2000) develop a process-oriented model to assess the impacts of IT on critical business activities in the value chain, incorporating management practices and corporate goals for IT as key factors affecting realized IT payoffs. Business executives are the main focus of this model in their role in deciding how, when and where to use IT resources. Tallon et al.'s study confirms that the corporate goals resulting from management practices are useful indicators of payoffs from IT in the way that executives in firms with more focused goals for IT perceive greater payoffs from IT across the value chain. Moreover, higher perceived levels of IT business value are proven to be linked to management practices such as strategic alignment and IT investment evaluation. Figure 11 illustrates Tallon et al.'s conceptual model of IT business value.

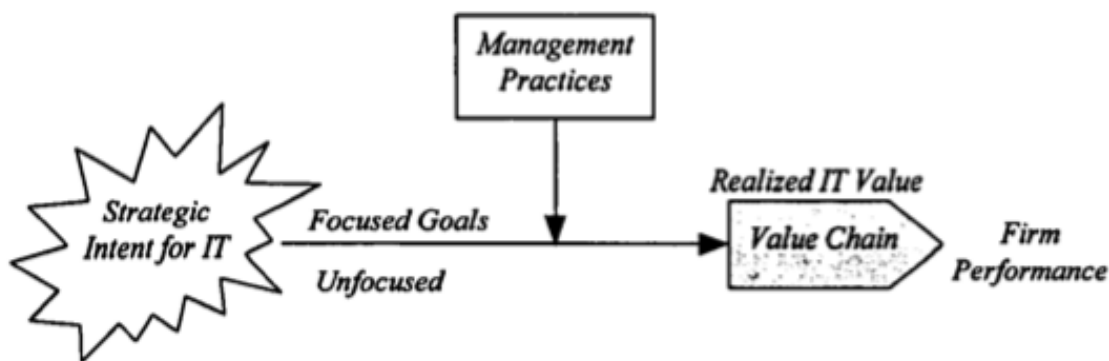


Figure 11. Conceptual Model of IT Business Value (Tallon, Kraemer, Gurbaxani 2000)

A final model for studying IS business value is the Technology-Organization-Environment (TOE) framework originally developed by Tornazky & Fleischer (1990). The Technology-Organization-Environment framework is very flexible: the model has been adapted to various contexts like service co-production and digital resource readiness (Tsou & Hsu 2015), ERP adoption in communications industry (Pan & Jang 2008) and IT value creation in e-business environments (Zhu, Kraemer, Xu and Dedrick 2004) to name a few. Most TOE research, however, is focused on e-businesses and innovation adoption (Tsou & Hsu 2015) and since

XBRL adoption can be treated as a new innovation adoption, it is relevant to review the possibility of using the framework also in the context of this study.

The TOE framework was created by Tornazky and Fleischer to study the adoption of technological innovations; three aspects of a firm’s contexts that influence this adoption and implementation were identified. First, the technological context comprising the relevant internal and external technologies to the firm, second, the organizational context – descriptive measures of the organization, and finally, the environmental context, to say the arena in which a firm conducts it’s business. (Pan & Jang 2008). Out of the three IT business value models reviewed in this section, the TOE framework is selected to be further used in this study due to it’s adaptability. A more thorough description of the Technology-Organization-Environment framework and its relation to this research will be provided in chapter 4.

4 Theoretical Framework

This chapter presents the theoretical framework, the Technology-Organization-Environment model, applied on this study. The TOE framework was selected as the most suitable one based on the literature reviewed in the previous chapters. Each component of the framework will be described individually and revised in the context of this specific research. In the empirical part of the study, the TOE framework was first used for choosing relevant themes for the interviews. Later on, a modified TOE framework was used for grouping the findings from the interviews into different silos.

4.1 Technology-Organization-Environment Framework

Zhu, Kraemer, Gurbaxani and Xu (2004) use the Technology-Organization-Environment (TOE) framework as the basis for their study on information technology payoff in e-business environments. The framework is chosen also for this study due to its flexibility and ability to apply in various technology adoption contexts. The TOE framework, originally developed by Tornazky & Fleischer (1990) is an organization-level theory that presents three aspects of a firm's context that influence the process by which it adopts and implements a technological innovation: technological, organizational and environmental contexts namely.

The technological context comprises of both the relevant internal and external technologies to the firm: already existing ones inside the firm and the available ones outside at the market. The organizational context, then again refers to several descriptive measures such as the firm size and scope, its managerial structure, the quality of human resources and the amount of slack resources available internally. Finally, the environmental context is the area in which a firm operates its business: the industry, competitors, the government and the access to the supply of external resources. (Zhu, Kraemer, Xu, Dedrick 2004). Figure 12 represents the three contexts of the TOE framework.

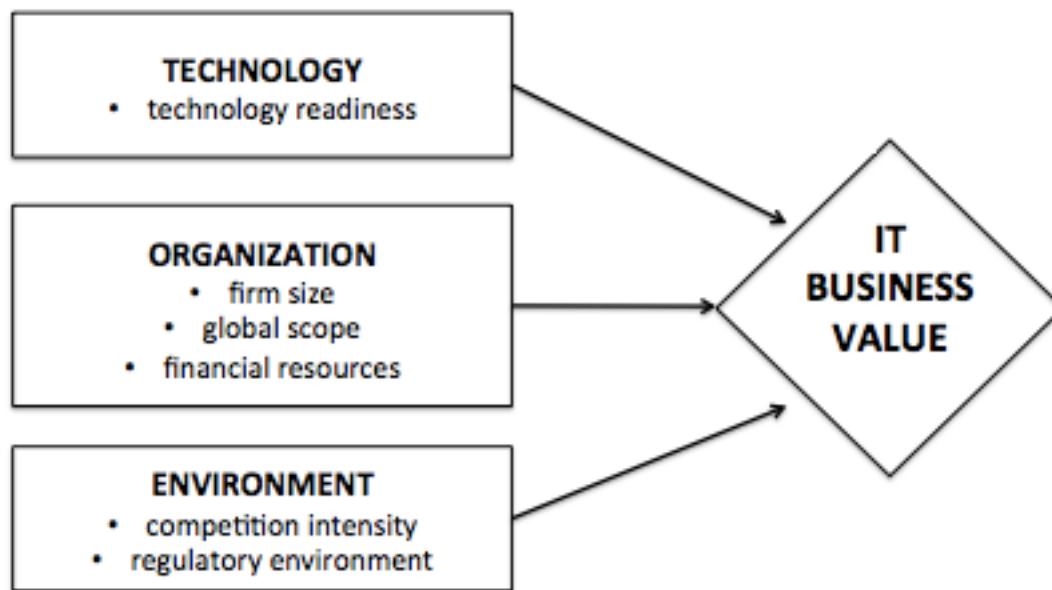


Figure 12. Technology-Organization-Environment Framework (adapted from Zhu et al. 2004)

4.2 The TOE Framework in the Context of XBRL Adoption

Lim & Perrin (2014) use the TOE framework to study the implementation and adoption of XBRL-based Standard Business Reporting (SBR) initiative in Australia. The SBR is an Australian government initiative aimed at simplifying the reporting process and thus reducing the reporting burden for businesses. The authors use the TOE framework in this context as it is strongly grounded in the literature. First, two technological characteristics of SBR are examined: perceived costs and quality. Second, three characteristics for the organizational context are studied: financial resources, expertise and top management support. Finally, the characteristics of the environmental context that are studied the external support and external pressure received by businesses. (Lim & Perrin 2014).

Henderson, Sheetz and Trinkle (2012) also apply the TOE framework in their study on XBRL adoption in two distinct contexts: internal and inter-organizational purposes. According to Henderson et al., testing the TOE in both of these contexts is important when investigating XBRL adoption because of the fact that the drivers of internal XBRL adoption may differ from those of inter-organizational XBRL adoption. Internal XBRL use, according to Henderson et al., refers to the use of XBRL for establishing a common vocabulary for financial purposes throughout an organization, for facilitating data migration and transfer

across different systems or for archiving financial data to name a few. Inter-organizational use of XBRL, then again, refers to for example communicating with trading partners, transferring data between applications or automating traditionally manual transactions between trading partners (Henderson et al. 2012).

Likewise to Lim & Perrin, also Henderson et al. have identified different characteristics of XBRL that relate to the three contexts of the TOE framework. The technological constructs examined in Henderson et al.'s study are relative advantage, compatibility and complexity. Secondly, the organizational constructs studied are the expertise and the organizational learning from external sources. Finally, Henderson et al. identify mimetic pressure, coercive pressure and normative pressure as environmental constructs affecting the adoption of XBRL. (Henderson et al. 2012). Figure 13 represents the three sets of constructs of the TOE framework and their link to the adoption of internal or inter-organizational XBRL.

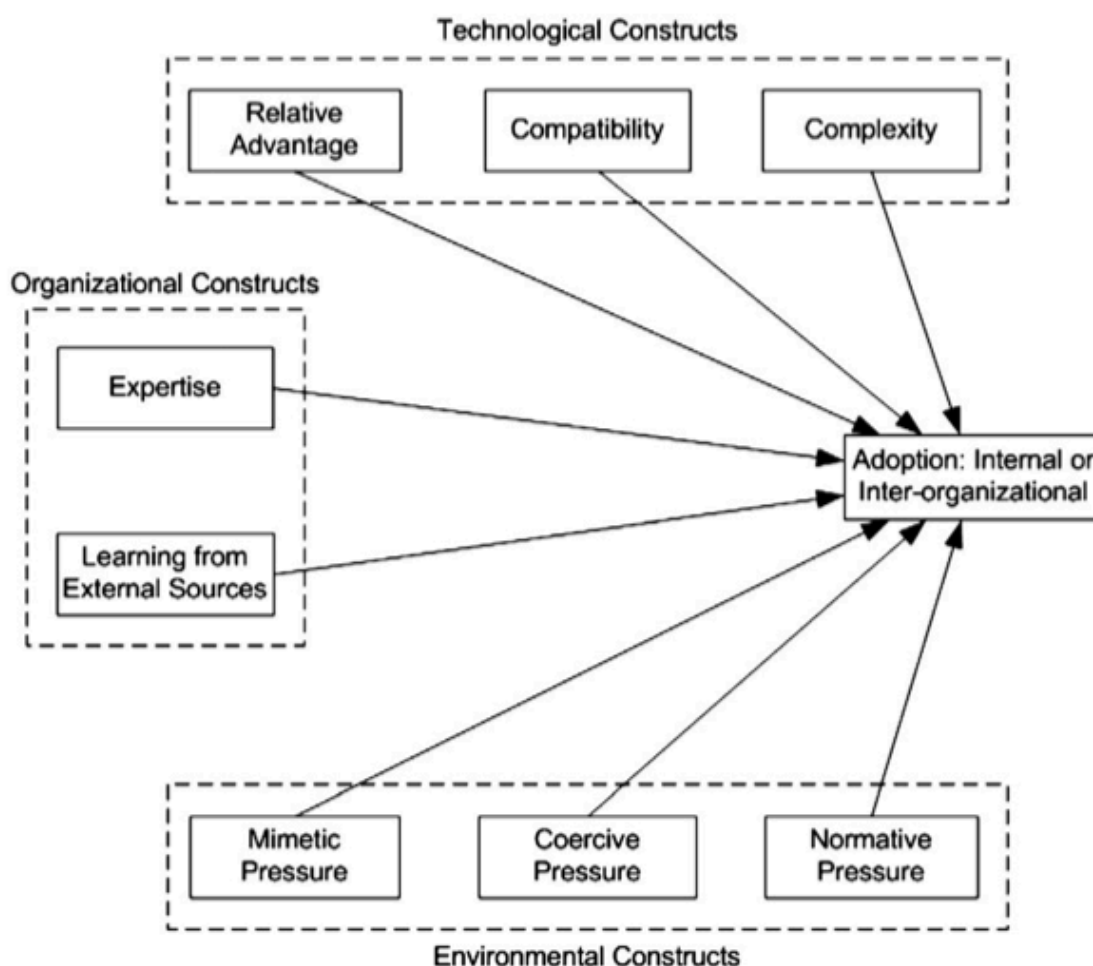


Figure 13. TOE and XBRL. (Henderson, Sheetz & Trinkle 2012)

5 Research Methodology

This chapter discusses the research approach chosen for the study. The methods for data collection and analysis will be presented and possible alternative approaches briefly reviewed.

5.1 Type of the Study

The purpose of this research is to find out what kind of potential business value XBRL reporting could bring to the main Finnish organizations receiving financial reports. To arrive at this goal, the benefits for financial report receivers in other European countries, more advanced in using XBRL, are explored. Moreover, a thorough review on the existing XBRL literature as well as the academic research, theories and theoretical frameworks related to the business value of IT is conducted. Based on this review, the most applicable framework was chosen to use as help for choosing themes from the qualitative interviews. Later on, a modified version of the same framework was used for grouping the findings from the interviews into different silos.

The exploratory research is qualitative in nature. Qualitative research aims to understanding a phenomenon, answering the question “what?”, rather than measuring it as quantitative research does. The focus of qualitative methods is in exploring meanings, purposes or realities by discovering and understanding the experiences, perspectives and thought of participants (Hiatt 1986). The challenge in qualitative analysis is in working with massive amounts of data; words and languages with multiple meanings. For this specific study, a qualitative approach is chosen because only a little is known of the phenomenon (Strauss & Corbin, 1990, 19-23).

Creswell (2007) has listed five different strategies to apply in qualitative research: narratives, phenomenological studies, grounded theory studies, ethnographies and case studies. For this research, a multiple, two-fold case study is conducted to study the phenomenon of which the concepts and variables are not easily quantifiable. Case studies are especially well suited for areas of research that are new or for which existing theories don’t seem adequate. (Ghauri & Gronhaug, 2002, 171). Case studies may involve either one or many cases and can be analyzed on multiple levels: Yin (2003) differentiates between single, holistic and multiple case studies. For this specific research, a multiple case study method is chosen because the

aim is to explore differences between and within cases and understand the different perspectives of the many case organizations.

5.2 Data Collection

Typically, case study research combines several data collection methods such as interviews and observations. In-depth qualitative interviewing involves conducting intensive individual interviews with a small number of respondents to explore their perspectives on a particular idea, program or situation. An in-depth interview should be chosen as the primary data collection method especially in cases where detailed information on a new issue is required, as in this research.

In general, interview types can be divided into three different structures: structured, unstructured and semi-structured. Structured interviews have a fixed format and pre-defined response categories. Questions are sent in advance and there is generally little room for variation and open-ended questions in the interview. In contrast, in an unstructured interview, there is no structured interview guide and the respondent is free to express reactions, opinions and behaviours in his own way. The questions tend to be open-ended and the interviewer holds only a little control over the interviewee's responses. (Ghuri & Grønhaug 2005). Semi-structured interviews, which are a mix of the above alternatives, were chosen for this study to due to the possibility to ask flexible, open-ended questions and ensure all relevant information can be gathered.

7 semi-structured interviews in total were conducted for this study during a five-month period from January 2015 to May 2015. The first four interviews concerned the Finnish report receivers: Finnish Tax Administration, National board of Patents and Registration in Finland and Statistics Finland. One expert in the field from both National board of Patents and Registration in Finland and Statistics Finland was interviewed, whereas from Finnish Tax Administration, two persons were chosen with different kinds of knowledge on the area. The latter three interviews were pointed to the European public authorities receiving financial reports: Netherlands Tax & Customs, National Bank of Belgium and Danish Business Authority. One expert in the field was interviewed from each organization. All the interviewees were selected on the basis of their knowledge on XBRL and active participation

its implementation in their own organizations. See the Reference section for the detailed interviewee profiles.

All the interviews ranged from 30 minutes to one hour in duration and were audio recorded and later transcribed. See The interview transcripts can be provided by request. Some notes were taken already during the interview but also audio recording was used because it facilitated concentrating on the responses already during the interview and react to them accordingly. An interview guide with three different topics was sent to all interviewees in advance to familiarize with. For the Finnish report receivers, 13 questions were posed whereas for the European counterparts, the guide included 19 questions. The mostly open-ended questions were used as a basis for the discussion on the different topics: Financial Reporting Process (Technology), IT Management (Organization) and Technology Implementation (Environment). Typically for a semi-structured interview, the respondents were left to freely express also other opinions and experiences on the area, outside the pre-defined questions.

5.3 Data Analysis

Qualitative data analysis aims in organizing the gathered data into smaller silos, themes or essences, where descriptions, models or theories can then be applied. One way to analyze data in qualitative research is to code it. Coding allows the researcher to explore the bits of information in the data, look for similarities and differences in it to then categorize and label the data (Walker & Myrick 2011). In the grounded theory method, coding is not simply a part of data analysis but the “fundamental analytic process used by the researcher” (Corbin & Strauss 1990, 12). The data analysis in grounded theory consists of two processes: first, coding the data to systematically analyze it to prove a certain proposition or assumption, second, inspecting the data to track categories, analyze the data and develop theories. Based on grounded theory, the method of constant comparison, together these two processes can achieve the goal of generating a theory from the acquired data (Glaser & Strauss 1967).

In this study, the grounded theory method was applied loosely. Due to the contradicting views of different researchers on the data analysis in grounded theory, it was decided not to follow the method too strictly but rather use it as a basis for breaking down the data into categories and finding the theory particular to this research. In the grounded theory method, the

researcher does not try to prove an existing theory but chooses an area of interest instead, allowing it to then emerge (Strauss & Corbin, 1990, 23). The data analysis in this research began with listening to the audio recorded interviews multiple times and transcribing them. Then, the transcripts were read thoroughly, also multiple times, to develop a deeper understanding on the topic. Notes and memos were made in this part of the data analysis to later use for grouping it into silos. The data was then coded into Excel and divided into relevant themes and categories that related to the TOE framework used in choosing the interview topics in the first hand.

5.4 Reliability and Validity

Reliability refers to the repeatability of findings. If a reliable study was conducted for another time, the second researcher should end up with the same findings as the first one. In qualitative research, clearly describing the study methods and documenting carefully all the materials and references can improve the reliability of a study (Yin, 2009, 45). Validity, then again refers to the credibility of believability of a certain study. Validity encompasses two different aspects, firstly, internal validity concerning whether the study truly measures what it is supposed to measure, secondly, external validity concerned with the possibility of generalizing the study results. The validity of a study can be enhanced by using data triangulation: the use of different data sources and methods (Ghauri & Grønhaug, 2002, 181).

In this study, reliability was taken into account by clearly describing the research methodology and data collection methods used as well as transcribing and documenting all the gathered research data and providing all additional relevant information in the appendices. Validity was improved by collecting data from multiple different sources: interviews, seminar documents and presentations as well as previous academic research appearing in journals such as the Journal of Management Information Systems, MIS Quarterly and Information Systems Research.

6 Findings of the Study

This chapter presents the findings of the empirical part of the study. The empirical part is twofold and consists of a set of interviews conducted in winter and early spring 2015. The first four interviews were targeted to the main Finnish public authorities receiving financial reports: Finnish Tax Administration, National board of Patents and Registration in Finland and Statistics Finland. The aim of these interviews was to investigate the current situation with regards to financial reporting in the case organizations: what kinds of challenges are experienced at the moment and how could XBRL address them. The following three interviews were focused on three main public authorities receiving financial reports in Netherlands, Denmark and Belgium: Netherlands Tax & Customs, National Bank of Belgium and Danish Business Authority. These three authorities are on an advanced level in using XBRL in their financial reporting process and thus their knowledge and best practices can be used to predict the potential impacts and business value of the implementation of XBRL in Finland as well.

6.1 Finnish Report Receivers

The first chapter in the empirical part concentrates on the findings regarding the Finnish report receivers: the financial reporting process and the current technologies used in each case organization as well as organization specific characteristics that may impact the future adoption of the XBRL standard.

6.1.1 Financial Reporting Process and Current Technologies Used

The first step in understanding the potential business value of the XBRL reporting standard on financial reporting for the Finnish report receivers is to investigate the current state of the process. The interviewees were first asked questions about the reporting process itself, then it's significance and importance to the organization and finally the existing challenges and best parts of the process. The characteristics of the current financial reporting process in each case organization as well as the main findings of the first set of questions are summarized in Table 1.

<p>Statistics Finland</p>	<p>Collecting statistics is the core process of the organization and financial reporting is one part of these statistics. There are two main sources of information: government registries and straight questionnaires to companies. Most questionnaires are utilized through the web but there are also other ways for collecting data like co-assisted interviewing. XBRL is also used in a minor part. The volume for the received financial reporting data ranges from 10 000 to 20 000 questionnaires/ year.</p>
<p>National Board of Patents and Registration Finland</p>	<p>NBPR works in co-operation with the Finnish Tax Administration with the purpose of collecting financial reports from companies and publishing them. The financial reports come to NBPR either directly from companies or through Tax Administration and are either in digital or paper format. The volume for the financial reports received from public companies is approximately 160 000 per year.</p>
<p>Finnish Tax Administration</p>	<p>Collecting financial reports is the core process of the organization – the taxation of companies is based on this process. Companies have multiple channels for reporting: web services, digital services, operators and paper. 70% of the reports are in digital format and the 30% that come in paper format are made into PDF:s. The volume for the reports received is approximately 665 000 per year.</p>

Table 1. Financial Reporting Process (Finland)

6.1.1.1 Statistics Finland

As can be seen from Table 1., financial reporting has a significant role in each case organization’s operations. For Statistics Finland, the core activity of the organization is to collect different types of statistics, concerning a broad range of topics from environmental questions to financial data. Some of the information comes directly from companies but especially when it comes to financial reporting, Statistics Finland relies on third parties – the information is most often gathered from government registries from other public authorities such as the Finnish Tax Administration and Finnish Customs. Most of the information comes in a digital format from web questionnaires but there are also other ways for collecting information such as co-assisted interviewing. The total number of questionnaires coming to Statistics Finland on a yearly basis is approximately 70 000 of which 10 000 – 20 000 handle financial reporting.

Tuomas Paavola from Statistics Finland describes the process of collecting the statistics as “trying to get a total picture” by cross-checking and combining the data coming from different sources. After drawing the total picture of the companies in the financial world, Statistics Finland then spreads the information to whoever might need it. Paavola suggests that some of the straight questionnaires could be replaced with XBRL and for a reference, estimates a drop of around 3000-4000 questionnaires to handle if the information could be gathered directly in a standard format such as Raportointikoodisto or XBRL. If the data was directly available and usable, it would also reduce the administrative burden from the Finnish Tax Administration as there would no more be a need to send any data to Statistics Finland separately.

A major problem in the current process, according to Paavola is that every source uses their own systems that differ from the one used at Statistics Finland. These systems do not “speak the same language” and may include different types of classifications as well as work only with specific software systems. Then again, Paavola also sees a benefit in the current process with the data coming from multiple sources: the data can be cross-checked against each other in between the sources, ensuring that the quality is good. Still, there is a lot to develop in the the data collection processes. Paavola describes the current situation from the respondents’ point of view: “there is an old kind of government official thinking that we only do our job and gather the information that was required from us by for example EU and don’t try to actually make it easy for the respondent”. Paavola thinks that more weight should be given to making the process easier for the respondents, so that they could easily give accurate answers even though not using the systems on a frequent basis.

6.1.1.2 National Board of Patents and Registration Finland

The purpose of the National Board of Patents and Registration Finland (NBPR) is to collect financial reports from companies and publish them. NBPR co-operates with the Finnish Tax Administration to fulfill this purpose. It is regulated by the law that companies need to publish one financial report which is then used as base data for generating both the tax report and financial statement. Similarly to Statistics Finland, also NBPR receives a part of the financial reports from third parties, the Finnish Tax Administration namely, whereas the other part comes directly from companies. The financial reports arrive to NBPR in either digital or paper format. The digital reports can be processed directly, while the paper reports

first need to be scanned and transformed into PDF files. The volume of the reports received from corporations is approximately 160 000 per year.

Sakari Kauppinen from NBPR describes the current financial reporting process as a challenging one. First of all, there is at the moment a quality problem as the content cannot be checked from paper. Second of all, there exists a major technical problem because the financial report is received as attached to the tax report – this means that both public data and secret data are received together, which creates a challenge for finding the correct data at NBPR. Third of all, a timing problem occurs as the reporting processes are tied together with Tax Administration. From NBPR’s point of view this means that some data is received too early and as incomplete: the Finnish law says that the financial report must be prepared in a four month timeframe whereas it has to be confirmed only within a six month timeframe. Due to the two-month gap, some reports come as incomplete to NBPR and in the current process there is no other possibility for correcting this mistake than to wait for the confirmation to come later. With a process using XBRL, the data could be identified and validated already before it gets to NBPR (at Valtori) and no unnecessary correcting steps would be required anymore.

Kauppinen sees XBRL as the best possible tool for tackling the challenges in the current process: with a standard report, the content could be checked in the receiving phase, eliminating any corrective steps from further in the process. XBRL would also increase the information service levels of the process as it would enable computer checking for the data. In the current process handling PDFs, the data is not computer readable which creates unnecessary manual work.

6.1.1.3 Finnish Tax Administration

For the Finnish Tax Administration, financial reporting is a core process. Minna Rintala, head of XBRL at Finnish Tax Administration illustrates the importance of the operation by reminding that the whole taxation of companies is based on these reports. Finnish Tax Administration is the only case organization that receives financial reports only directly from companies. However, the channels through which the reports are received are still numerous: some of the reports come through web services or other digital services, others are received through operators or come in paper forms or documents. 70% of the received reports are in digital format, the remaining 30 % that come in paper are scanned and transformed into PDFs

at Finnish Tax Administration. The volume of the received reports from companies is approximately 665 000.

Tarja Rautio from Finnish Tax Administration sees the high digitalization rate of the current process as a benefit that helps tying together the internal processes at Finnish Tax Administration. The major challenges according to Rautio arise from the paper process: “anything that comes as PDF is hard to disseminate”. A major goal of the moment is to eliminate the paper reporting coming from companies completely. In the paper reports, there are lots of unclear information and even though ready fillable reports are used, they are very error prone. This creates extra costs as 5-15% of the documents need to be completed later on.

Minna Rintala from Finnish Tax Administration highlights the challenges of the current process from the respondents’ point of view: the amount of available reporting channels is huge and it would be not only easier for the respondent but also more cost efficient for Tax Administration to diminish the number of available channels. The large amount of different channels also means that there is a lot to maintain and update towards multiple instances, which requires a lot of resources from Tax Administration. Less resources would be required if the data would be in a computer readable, standard format and could be checked and validated in the beginning of the process. Moreover, analyzing and comparing this kind of readable data would be much more convenient. Rintala notes that from the Tax Administration viewpoint, the current process is sufficient and fulfills its purpose, however, there is room for improvement from the point of view of the downstream users. For example, the step where Tax Administration provides reports to NBPR could be removed if the data was given to downstream users directly in a structured format.

6.1.1.4 Summary of the Findings Related to the Financial Reporting Process

As the above chapters suggest, the case organizations utilize very variable channels, methods and technologies for receiving financial reporting information from companies. Each organization has its own challenges that can hopefully be addressed with help of XBRL. Most of the challenges arise from the still remaining paper processes that create unnecessary extra steps and a lot of manual work. Another important takeout from the interviews is the respondent or customer viewpoint in the current process – the systems are not very user friendly and the possible reporting channels can be numerous, which creates extra difficulties

and a risk for errors already in the very beginning of the processes. As a standard fillable, digital format that doesn't allow any errors in the completion phase, XBRL could not only make the reporting task easier for the respondent but would consequently also reduce the burden at the government offices handling the financial information.

6.1.2 Organizational Characteristics Contributing to New IT Implementations

The second step in investigating the impact of the XBRL reporting standard for the Finnish report receivers is to form an understanding of the specific organizational characteristics that might affect the XBRL adoption for each case company. To reach this goal, the interviewees were asked questions regarding their technology management practices, processes for new IT adoptions and possible evaluation methods for new IT implementations. Each interviewee was also asked to illustrate the implementation of a new technology in their organization through a real life example. These organizational characteristics for each case company are presented in Table 2.

Statistics Finland	Statistics Finland is ran from the top to bottom: directors are making all decisions. There is no technology management process per se, the upgrades are always made as part of a project. The success of any new technology implementation is evaluated only lightly.
National Board of Patents and Registration Finland	The organization has an own IT department that coordinates new technology implementations together with the operational levels. High level management has the decision power. Any new developments are made into projects, the success is then evaluated against the project goals.
Finnish Tax Administration	The IT department makes the decisions for any new IT implementations based on the operational units' suggestions. The success of the implementations is evaluated during the project, against project goals. There are no set practices for evaluating the success for new IT systems.

Table 2. Organizational Characteristics Affecting XBRL Adoption (Finland)

6.1.2.1 Statistics Finland

Tuomas Paavola from Statistics Finland states that there doesn't exist a technology management process in his organization "per se". Each upgrade to any technology is implemented as part of a project and decisions are made on high management level. There is an initiative for the future to implement some kinds of management groups that would handle any technology briefcases. At the moment, the success of any new IT system implementations is evaluated only lightly. The evaluation seems to be rather reactive than proactive: Paavola says that something is being evaluated only if there is a noticeable change in operations, for example a drop in hours spent doing a certain task. According to the interviewee, auditing is the clearest evaluation practice in place at the moment for IT systems at Statistics Finland. Paavola wishes that in the future, there would be an instance to take more ownership and responsibility of the implementation projects.

To illustrate the process of adopting a new technology to the organization, Paavola uses the recently implemented Katso-identification as an example. Katso-identification is a system that is being used together with the Finnish Tax Administration: a system through which companies can use the electronic services by identifying themselves with a unique Katso-id. Statistics Finland has implemented this service to those surveys that are targeted to companies. The major challenge is this implementation from the point of view of Statistics Finland arose from the fact that the service was designed from the perspective of the Tax Administration: while the Tax Administration only has around 10 different forms for the respondent to use, Statistics Finland has tens and tens of questionnaires. Consequently, the different connections inside the system, for example an accounting firm responding on behalf of ten companies, are difficult to handle in terms of the identification.

6.1.2.2 National Board of Patents and Registration Finland

The National Board of Patents and Registration Finland has its own IT department that deals with any new technology implementations together with the operational units. All new technology developments are made into projects with an own specific budget and targets to follow. At the end, the high level management holds the power to decide on these projects. Consequently, the success of the implementations is evaluated against the project targets. Most of the time, only end goals are set, although for bigger projects also smaller milestones are set. The government way of developing is slow and heavy: the projects are big and long

before any real results can be seen. Sakari Kauppinen wishes for a lighter, faster way for developing in the future.

Kauppinen from NBPR uses a recent example from the trade register renovation project to illustrate the process of a new technology implementation in the organization. This project was conducted together with the Tax Administration with the goal to transform all trade register documents into a digital format. The project was large and there were many challenges, however the three-phase implementation was successful at the end: the old paper process doesn't exist anymore. A surprising outcome to note from the project is that the customers were slower adopters of the new practices than was predicted: it took a lot of time and practice from their side to start using the new system.

6.1.2.3 Finnish Tax Administration

At the Finnish Tax Administration, the IT department makes decisions on any new technology implementations based on suggestions coming from the operational units. There is a process for operational developments where any IT changes go through an ICT group consisting of the IT manager and heads for the development project. There is also a yearly round for operational planning, where the operational units prioritize any new developments that have most importance from their perspective. The success of the new implementations has not been measured actively: only the accomplishments of project goals are being measured. According to Minna Rintala, a problem for the joint IT development projects within multiple government agencies is that there is no clear ministry level responsibility over these implementations.

To describe the process of a new technology implementation, Rintala from the Finnish Tax Administration refers to the same example as Tuomas Paavola from Statistics Finland: the renovation of the government's identification and authorization services. Rintala can't state any specific challenges in the new technology implementations, however she comes back to the same fact that was mentioned by Sakari Kauppinen at NBPR: the government way of developing is heavy and slow. At the Tax Administration, there are a lot of on-going projects but nothing is really ready. The Tax Administration is also currently waiting for new solutions to implement and be able to harness in the future.

6.1.2.4 Summary of the Findings Related to the Organizational Characteristics

The above descriptions show that the ways of implementing and managing new IT system adoptions at the case organizations are variable and not very structured. At Statistics Finland, there is no clear technology management process but rather distinct development projects that are managed at a high organizational level. The success of new IT projects is not evaluated on a regular basis and a clear responsibility and ownership for these projects is missing. The National Board of Patents and Registrations Finland, then again, has its own IT department and seems to be more coordinated in managing the technology implementations. Each new implementation is projected and its success is evaluated against the project goals. Finally, similarly to the NBPR, the Finnish Tax Administration also has its own IT department to handle any new technology implementations, based on suggestions coming from the operational units. Despite the existence of this department, the success of the IT projects is evaluated only during the project against project goals. At the Tax Administration, there is an initiative for developing also the post-implementation evaluation in the future.

6.2 European Report Receivers

The second chapter in the empirical part presents the findings from the interviews targeted to the European report receivers who have already adopted the XBRL standard. Similarly to the first part of the empiria, the financial reporting process, technologies used and the specific organizational characteristics affecting technology implementations for each case company are presented. Moreover, an understanding of the impact of adopting the XBRL standard is formed by investigating the implementation of the XBRL reporting standard as well as the differences between the current state of the financial reporting process in contrast to the situation before XBRL. This part of the empiria can be used to predict future benefits and outcomes for the XBRL implementation for the Finnish counterparts.

The aim for interviewing the European “counterparts” for the Finnish case organizations is to get as wide an understanding of the resulting benefits of adopting XBRL as possible. Therefore, financial report receivers from different European countries rather than multiple report receivers from one specific European country are interviewed. This is reasonable also due to the possibly differing country-specific financial reporting backgrounds that the case organizations may have. The countries chosen for this specific case study are Netherlands, Denmark and Belgium due to their experience and advanced practices in applying XBRL.

The specific organizations interviewed are Netherlands Tax & Customs, National Bank of Belgium and Danish Business Authority namely. One XBRL expert from each case organization participated in an approximately one hour-long interview.

6.2.1 Financial Reporting Process and Current Technologies Used

Likewise to the Finnish report receivers, the interviewees from the three European countries mentioned above were first asked to describe their financial reporting practices and the importance of this process for the organization as a whole. Also the old financial reporting process as it used to be before adopting XBRL was discussed and the improvements resulting from the current practices named. The interviewees were also asked what kinds of tools are currently used in conjunction with the XBRL reporting practices. Table 3 summarizes the key points from the first interview topic.

<p>Netherlands Tax & Customs</p>	<p>Receiving 90% of the wage tax filings and almost 90% of the corporate income tax filings from companies. For the entrepreneurs, the process is fully digitalized whereas for the citizens, there are still some filings coming on paper. There is a distinction between the type of filings. For the VAT, 60% come manually using web forms and 40% using XML, whereas for the corporate income tax, 90% come in XML.</p>
<p>National Bank of Belgium</p>	<p>Receiving the annual reports of the majority of organizations and non-profits which equals to over 400 000 reports. The reports come directly from companies through the bank website. 98% are standardized reports whereas 2 % are reported in PDF or paper.</p>
<p>Danish Business Authority</p>	<p>Receiving the annual reports from 98-99% of all companies in Denmark which equals to 150 000 filings every year. The filings come in XBRL or PDF – 15% come directly from companies through an online tool or system, 40% through and government portal and another 40% straight from system to system.</p>

Table 3. Financial Reporting Process (Europe)

6.2.1.1 Netherlands Tax & Customs

Until 2004, Netherlands Tax and Customs received all filings in paper format until then starting to digitalize the financial reporting process. In total, the authority is receiving 90% of the wage tax filings (from citizens) and nearly 90% of the corporate income tax filings (from companies), making financial reporting a core activity for the organization. There is a mandate for entrepreneurs to file their tax filings individually: they can choose between manually filling a web form or sending the filing directly as an XML document into Netherlands Tax and Customs' systems. For entrepreneurs, the process is already fully digitalized but citizens still send some filings in paper format. There is a distinction between the type of filings and the method for reporting as well: for the VAT, 60% of the reports are made manually using web forms whereas only 40% using XML. For the corporate income tax, then again, 90% of the reports are made in XML. Netherlands Tax & Customs uses a set of own as well as commercial tools for validating and converting the data.

According to Frans Hietbrink from Netherlands Tax & Customs, the best part of the fully digitalized process is that all kinds of business rules can already exist on the filing before actually receiving it, which means that a lot of validation can be done already early in the process. The rules are given in the taxonomy so there is no need to go back to the tax payer, asking to correct anything. Hietbrink also notes that the process is coordinated and consistent with for example receiving statistical reports. The same consistent set of data and definitions can be easily sent to multiple parties, for example schools, hospitals and ministries. Having a consistent process makes it easier for not only Netherlands Tax & Customs to make early reviews for tax law renovations and changes, but also to the software vendors to develop their systems when they already have the validations integrated.

One challenge related to XBRL usage at Netherlands Tax and Customs, according to Frans Hietbrink, is that there is not yet a standard process for the identification and authorization of the respondents. There is an initiative for implementing a system allowing one person to authorize another by using the website. It is not clear, however, whether this method would work for corporations like tax consultants. Another challenge is to motivate software developers in advance to invest in XBRL knowledge and skills to make system connections between the government's and their own systems. According to Hietbrink, technicalities are not a problem because of the already existing data centers and the possibility to use XBRL to define and validate anything – the question is rather about getting the industry moving.

6.2.1.2 National Bank of Belgium

The National Bank of Belgium receives the annual reports for the majority of organizations and non-profits, which equals to approximately 400 000 companies. Out of these reports, 98% are standardized reports, using a modeled annual account, whereas the remaining 2% are reported in either PDF or paper. Out of the non-standardized 2%, 0-1% still come in paper form while 99,9% are reported electronically, using a specific format. The reports come to the bank directly from companies and non-profits, and an internally developed software to report in XBRL format is used. Also external software vendors have developed integrated XBRL creators in their own accounting softwares. The National Bank of Belgium utilizes a set of both own and commercial tools for creating the taxonomy as well as validating it and rendering the annual account.

Bertrand Jadoul from the National bank of Belgium sees XBRL most of all as a driver to work coherently: the need for creating a standardized annual account obliges companies to define a lot of concepts already inside the company. Operating in a coherent way, it takes less time to create the annual account, resulting in less maintenance costs. The user can validate the annual account online already before sending it, seeing any possible errors in advance and making the corrections online. As a result, the National Bank of Belgium has less problems with the format of the data: most of it comes correctly thanks to the early validation. Also, much less people are needed at the bank to handle this data than in the process before XBRL. Moreover, the standardized data is fairly easy to disseminate. All in all, the annual updates have become a lot easier and more transparent thanks to XBRL. Although the process itself has not changed, it has become more efficient because there are less corrections to do.

A challenge in using XBRL according to Bertrand Jadoul results from the fact that many standards were not yet defined when the XBRL reporting was developed. Therefore, validation rules are not yet integrated in the taxonomy but rather need to be uploaded separately. In the future, integrating the validation rules into the taxonomy will make the process even more easy to both the National Bank of Belgium and the software vendors. Another future challenge according to Jadoul is the increasing complexity of XBRL: in the beginning, everyone could easily understand the format and the content of XBRL – now, however, the software developers are becoming more and more IT oriented, moving further apart from the business.

6.2.1.3 Danish Business Authority

The Danish Business Authority receives approximately 150 000 filings from companies on a yearly basis, covering approximately 98-99% of all companies in Denmark. Filing is mandatory for all companies but there are a lot of different filing options within the mandate: 90% of the filings come directly from the companies to the authority through an online tool, 10% through a web service or portal; 40% using the online government portal and 60% straight from system to system. In total, 80% of all the business filings come to the Danish Business Authority, making the operation a keystone in the organization. The Danish Business Authority, likewise to the other two case organizations, uses both own and commercial tools for creating and validating the XBRL documents. Also tools for generating and writing new taxonomies are used but there is still a need for good business intelligence tools for analyzing the received data.

According to Niels-Peter Ronmos from the Danish Business Authority, the best characteristic of the XBRL financial reporting process is its flexibility thanks to the amount of filing options given to the companies. This is an important aspect especially from the respondents' point of view. Moreover, as all data is in a digital format, no manual reading is needed and it is also easier to look into the data, giving the authorities much more insight to the annual reporting in Denmark. A two-sided change, that has both its benefits and drawbacks, brought by XBRL, is that the new way of filing allows the authorities to see all errors more easily. This of course makes it easier to the observer to catch any possible violations of regulations, but it also shows that actually XBRL has not reduced the amount of errors made in the filing phase. Ronmos notes that the validation still needs to be improved a lot in the early phase by tightening the regulations.

Another challenge to handle in the future is the information overload that results from catching all the errors in the annual reporting. Ronmos describes the difference: "In the old days, somebody was looking to the annual reports, catching maybe 2% of the errors. Now, however, we catch all 200 000". The question is then about how to handle all these violations and mistakes in filing without the required capacity. Ronmos also notes that XBRL is seen as a burden by the other parties involved: digital processes are seen as something very costly, creating objecting opinions in the market.

6.2.1.4 Summary of the Findings Related to the Financial Reporting Process

As the above chapters describe, financial reporting is a core activity for each European case organization interviewed. XBRL has been adopted in each of the organizations to improve the efficiency of the financial reporting process and it has created a number of benefits as well as some unexpected challenges for the report receivers. The most significant benefits arise from the possibility for early validation of the data already in the filing stage – this allows catching any possible errors already early in the process, reducing manual work from the later stages. The early validation and definition of concepts already in an early phase also facilitates the dissemination of the data for multiple different parties. For the Danish Business Authority, the improved transparency has also turned out to be a challenge, creating “information overload” and a problem of managing all the errors caught in the process. Other challenges from using XBRL for the case organizations are the lack of existing standards for data validation (National Bank of Belgium) and the lack of systems for identification of the respondents (Netherlands Tax & Customs).

6.2.2 Organizational Characteristics Contributing to New IT Implementations

Likewise to the first part of the empiria, also at this point the specific organizational characteristics of each case organization, that might affect XBRL usage and adoption are investigated. Again, the interviewees were asked questions about the technology management practices in their organization as well as evaluation methods for new IT implementations. The respondents were asked to use the implementation of XBRL in their organization as an example to illustrate the process for new IT implementations. The organizational characteristics for each European case company are presented in Table 4 and chapter 6.2.3. will go through the implementation of XBRL in each company in detail.

<p>Netherlands Tax & Customs</p>	<p>There is no specific technology management process but rather several processes to choose from depending on the situation. Project management, agile and scrum methods are used. The success of any new implementations is evaluated at IT system level or project level with measures such as less complaints received or less employees needed.</p>
<p>National Bank of Belgium</p>	<p>There is a technology management process where a new IT project is introduced each year by the head of the department. An evaluation of the costs and resources is made before the approval from the board of directors, followed by the adaptation, testing and implementation phases. The evaluation of the project success is made on yearly basis and a project closure document is created to evaluate the success.</p>
<p>Danish Business Authority</p>	<p>The IT management is very tight: everything needs to be documented into four different environment systems. The IT architecture is a very large and well orchestrated one where agile and scrum methods are used. New implementations are done by business cases and everything is being evaluated.</p>

Table 4. Organizational Characteristics Affecting XBRL Adoption (Europe)

6.2.2.1 Netherlands Tax & Customs

As table 4 above shows, likewise to the Finnish case organizations, also the European counterparts apply very variable technology management practices and evaluation methods for IT implementations. Frans Hietbrink from Netherlands Tax & Customs states that no one specific technology management process exists in the organization, but rather several different processes, from which a suitable one is chosen depending on the situation each time. Sometimes, project management, agile or scrum methods are used in these processes. The software development in the organization involves over 2000 people so there are a lot of practices to choose from for different situations. Each new IT implementation is evaluated by its success in either IT system level or project level. To evaluate the success, quantifiable measures such as “higher taxes”, “less complaints received” or “less employees needed” are used.

6.2.2.2 National Bank of Belgium

The technology management process in the National Bank of Belgium seems to be a well defined one. Each year, a new IT project is introduced by the head of the department. Next, an assessment of the costs and resources needed for the project is conducted. The project will then go for approval to the board of directors – an approval is then followed by adaptation, testing and implementation phases consequently. The evaluation of each yearly IT project is conducted on yearly basis likewise. A project closure document mirrors the success of each project and is used as a basis for the evaluation.

6.2.2.3 Danish Business Authority

Niels-Peter Ronmos from the Danish Business Authority describes the IT management in his organization as something very tight: all details need to be documented into four different environment systems. All in all, the IT architecture at the Danish Business Authority is a very large and well orchestrated one with different departments for many IT functions such as designing and service improvement. All new implementations are done in business cases and agile and scrum methodologies are used for managing the processes, making also project evaluation inevitable. However, there are no specific, repeating evaluation methods. Ronmos sees the IT management of the organization as something very mature and refers to a position at the highest stage of the Capability Maturity Model, that is used to evaluate software development processes, to describe the current state.

6.2.2.4 Summary of the Findings Related to the Organizational Characteristics

All in all, the case organizations seem to apply individual IT management practices with variable amounts of specification and defined rules. In all case organizations, IT management is a significant part of the operations, however no specified processes always exist for conducting and evaluating it. The National Bank of Belgium applies a uniform process for yearly IT implementation projects with clear evaluation methods, whereas Netherlands Tax & Customs adapts agile and scrum methods for IT process management always depending on the situation. The IT management at the Danish Business authority is very mature and the whole IT architecture well orchestrated. New IT implementations are realized through business cases and agile and scrum methodologies are used for process management. The

next chapter describes in detail how XBRL was implemented in each case organization under the organization-specific circumstances described above.

6.2.3 XBRL Implementation

This part of the interviews aims to better understand the implementation of XBRL in the European case organizations. Questions regarding any motives of incentives, third party involvement and implementation success were asked from the interviewees to get a complete picture of the possible challenges in implementing XBRL and the benefits that resulted from it in each case organization. This part of the interviews will help in predicting the outcome for any possible new XBRL introductions in the Finnish case organizations in the future. Table 5 summarizes the key findings regarding the implementation of XBRL in the European case organizations.

Netherlands Tax & Customs	Voluntary XBRL adoption with the motive of reducing the administrative burden for software developers and companies. Third party pressure from the market for making XBRL mandatory for everyone. Value creation on two levels: better quality of data and standard ways of working.
National Bank of Belgium	Voluntary XBRL implementation, motivated by the possibility for more efficient processes and cost as well as personnel reductions. No pressure from third parties, the market was supportive. XBRL didn't change the process of financial reporting itself but created value through better quality of data and less need for validation.
Danish Business Authority	From the organizations perspective, voluntary XBRL adoption with common sense and efficiency as the main motives. From the users' perspective, mandatory XBRL adoption. No third party pressure for implementing but disbelief from the market for XBRL success. Value especially from better insight to the annual reporting in Denmark.

Table 5. XBRL Implementation in the European case organizations

6.2.3.1 Netherlands Tax & Customs

Table 5 above shows the main characteristics of the XBRL implementations in the different case organizations. Netherlands Tax & Customs was one of the first voluntary developers of XBRL already in 2004. At the moment, XBRL is a part of the organizations corporate architecture, however, there were never politicians or other parties mandating the implementation. The main motive for implementing XBRL for Netherlands Tax & Customs was reducing the administrative burden for other parties involved such as the software developers and reporting companies. By working together with other government agencies with a standardized system, the tax office was aiming at improving the image of the financial reporting process for the customer. As the Tax Administration was running a fully digitalized process already before the XBRL adoption, there was no incentive for reducing personnel.

Although there was no third party pressure for the organization itself to implement XBRL, there was later a lot of market pressure to actually mandate XBRL use in Netherlands for all parties involved. All these parties – the government, the software developers and the entrepreneurs believed in XBRL – yet the individual parties did not commit fast enough and thus a mandate became necessary. Frans Hietbrink from Netherlands Tax & Customs refers to the complexity of the XBRL language and the difficulty of involving other people in the process on logical level. He believes that the success of the XBRL implementation in their organization was mainly due to the centralization of the teams in the organization. According to Hietbrink, XBRL created value for the tax office on two different levels: firstly, through better quality of data making it possible for people to work in silos and organize the work better, secondly, through the obligation for everyone to work in a standard way, making it easier to not only make adaptations to existing filings but also introduce totally new filings.

6.2.3.2 National Bank of Belgium

In 2003, the Central Balance Sheet Office at the National Bank of Belgium saw the opportunity of implementing XBRL as well as the possibilities it had to offer and decided to voluntarily become a driver for the adoption in Belgium. A non-profit organization was created to help in convincing also other organizations such as the ministry of economy and ministry of finance of the adoption of XBRL. As the National Bank of Belgium was the first one in the country to adopt XBRL, no pressure from third parties existed. Everyone in Belgium was convinced by the introduction of XBRL with common goals and a unified

future direction. The main challenge was to provide XBRL reporting that was also user friendly, another challenge was to convert XBRL information to a format looking exactly like a PDF for the purpose of publishing the annual accounts.

Bertrand Jadoul from the National Bank of Belgium emphasizes the fact that the financial reporting process itself didn't change after the introduction of XBRL although the format changed and the way how annual accounts are updated changed. A challenge related to using XBRL is the difficulty of finding skilled people with enough specific knowledge on the topic. The adoption of XBRL creates value as it has resulted in better quality of data and less need for validation. The first benefits of using XBRL started to realize already during the first year, reducing the maintenance burden for the annual update. The next benefits started to appear 1-2 years after the adoption as it started to become much easier to introduce new annual accounts. The third benefit appeared approximately four years after the XBRL adoption when it became possible for the software vendors and companies to develop software or applications that use XBRL documents directly, thanks to XBRL online.

6.2.3.3 Danish Business Authority

Likewise to the other two European case organizations, also the Danish Business Authority adopted XBRL voluntarily from their point of view, beginning the project in 2010, with common sense and a hope for improved efficiency as the main incentives. The process before XBRL was very inefficient and costly so the implementation was also about reducing costs and losses. There was no third party pressure for implementing XBRL for the Danish Business Authority. In contrast, all other parties involved, auditors, companies, even XBRL Denmark were against the adoption. From the user viewpoint, XBRL adoption was not voluntary. The market was not ready. XBRL use was seen as a burden and to some extent it still is. In the beginning it was challenging for the users to not only log in but they also had to pay an extra cost for tagging in XBRL for the auditors due to their resistance.

Thanks to a strong alliance with one single auditing company who was willing to implement XBRL voluntarily, it became possible to finally show the benefits for also the other parties. At the first phase of adoption, not much benefits were appearing and only now is the time when actual results are starting to show. According to Niels-Peter Ronmos from the Danish Business Authority, the most valuable outcome from the use of XBRL is the accessibility of the data as it is all in a digital, machine readable format. Thanks to the improved accessibility

and readability, The Danish Business Authority is able to make intelligence based policy changes, referring to actual facts. All in all, the introduction of XBRL has resulted in much more insight to the annual reporting in Denmark, making it possible for the authority to catch a lot more errors and define the kinds of groups that make errors in the accounting than previously.

6.2.3.4 Summary of the Findings Related to XBRL Implementation

As can be seen from the above chapters, all the European case organizations were willing to adopt XBRL voluntarily and no significant third party pressure was behind the introduction. However, there were external forces strongly present in each adoption: for Netherlands Tax & Customs as well as the National Bank of Belgium the market environment was very supportive, while in contrast, the Danish Business Authority was struggling to convince other parties involved of the benefits of XBRL adoption and experienced a lot of negativity from the market. Each organization had its own motivations for adopting XBRL and own organization-specific challenges to face when implementing it. Each organization sees that XBRL has created value in their processes, through improved efficiency, better quality of data and data accessibility mainly.

7 Discussion

In the this chapter, the main findings of the empirical part, concerning both the Finnish and European case organizations, will be discussed in detail and their relationship to the theory base reviewed in the first part of this thesis will be acknowledged. To follow the structure of the interviews, the contexts of “technology”, “organization” and “environment” as presented in Tornazky & Fleischer’s (1990) Technology-Organization-Environment framework are used as a lense to look deeper into the empirical findings.

7.1 Technology

The technological context in Tornazky & Fleischer’s framework comprises of both the relevant internal and external technologies to the firm: already existing ones inside the firm and the available ones outside at the market. In the context of this study, the technologies and practices used in the current financial reporting process inside each case organization were focused on and only XBRL was considered a relevant external “technology” of interest in the case for the Finnish report receivers. In the case of the European report receivers, any possible external technologies were left out of the focus of this study. Only questions regarding the previous state of financial reporting and the current state using XBRL were discussed. The Finnish case organizations were only asked a general opinion on adopting XBRL in the future – which for all of them was positive.

The interviews show that each Finnish case organization has their own specific financial reporting processes where different types of practices are applied. The coordination of processes between different government officials seems to be a crucial factor in the functionality of the financial reporting process. Differing goals and purposes for reporting in the different case organizations create challenges in building a coordinated process where one common reporting method or technology could be used. The slow and heavy government style for developing is mentioned both by NBPR and the Finnish Tax Administration as a hindering factor in improving the current financial reporting process.

Another takeout from the interviews for the Finnish report receivers is the importance of the reporting companies’ point of view. Both Statistics Finland and the Finnish Tax Administration mentioned the facilitation of the process for the respondents as a priority and something that needs to be improved in their organization. Tuomas Paavola from Statistics

Finland describes the problem by referring to “an old government official kind of thinking” where the organization only does its job because it is required by some higher level government instance such as EU. Minna Rintala from the Finnish Tax Administration, then again, sees the large number of different reporting channels as a major challenge from the respondents’ point of view. It would not only be easier for the respondents to cut down the amount of available reporting channels but it would also be more cost efficient for the organization as the number of channels correlates to the amount of maintenance required towards different instances involved.

Each Finnish case organization still receives an amount of the financial reports in paper format and both the National Board of Patents and Registration and Finnish Tax Administration also mention this fact as a major contributor to the existing challenges in their financial reporting processes. Sakari Kauppinen from NBPR explains that there is a quality problem in the current process as the content of the received data cannot be checked from a paper format. Because the data is neither in a computer readable format, handling it requires a lot of manual work. Tarja Rautio from Finnish Tax Administration also sees that the major problems in the current financial reporting process arise from the fact that the data is not in a computer readable format, as anything that is received as a PDF is hard to disseminate. In addition, the paper reports contain a lot of unclear information and they are very error prone even though ready fillable reports are in use. A lot of unnecessary costs arise from the paper process.

Similarly to the Finnish case organizations, also their European counterparts apply organization specific processes and practices regarding financial reporting. The digitalization rate of these organizations compared to the Finnish ones, however, is much higher and all in all the European case organizations are on a much more advanced level in using XBRL. Both Netherlands and Belgium are actually among the first XBRL adopters worldwide, having started the transition to a fully digitalized process using XBRL already in 2003-2004. Denmark, in contrast started the voluntary XBRL adoption project only in 2010.

Although Denmark is a bit behind the other case countries in the adoption of XBRL, all three organizations are already enjoying benefits from XBRL usage. Frans Hietbrink from Netherlands Tax & Customs sees the possibility for early validation as the main benefit from having the XBRL business rules already inside the system. He also refers to the consistency of the process between different government agencies that results from using uniform data

that is easily distributed among the different parties. A challenge in the process according to Hietbrink is the lack of a standard solution for identifying and authorizing the respondents. In Finland, this kind of system already exists and was described by both Statistics Finland and the Finnish Tax Administration in the interviews.

Bertrand Jadoul from the National Bank of Belgium divides the benefits resulting from the use of XBRL into different phases. The first benefits from reducing the need for maintenance for the annual update started to appear already in the first year of adoption. The next benefits followed 1-2 years after the adoption and were related to the facilitation of introducing new annual accounts. One more benefit that appeared approximately four years after the beginning of the project was the possibility for software vendors and companies to start developing own applications using XBRL documents directly. All in all, Jadoul sees that the annual updates have become much easier and much more transparent thanks to XBRL. They are also more structured and efficient and thus require less corrections.

Based on Bertrand Jadoul's description, it can be assumed that most of the benefits from the use of XBRL have appeared latest four to five years post implementation. This assumption is supported also by Niels-Peter Ronmos from the Danish Business Authority, who states that major benefits are starting to appear “only now” – approximately five years after beginning the implementation. In contrast to Rintala's comment at Finnish Tax Administration about the respondents' burden from using multiple reporting channels, Ronmos sees the flexibility of their XBRL process, offering multiple different ways for reporting as a major benefit for the respondents. In the Danish process, the respondent can choose freely for example which year's taxonomy they wish to use for reporting. Another benefit in addition to the flexibility, according to Hietbrink, is the improved insight to the reporting in Denmark and the increased likelihood for catching any possible errors in the respondents' practices. The counterpart of this benefit is the inability to address all the found violations properly.

The Finnish Financial report receivers seem to experience a number of technology and current reporting practice related challenges in their financial reporting. Based on the descriptions of the benefits resulting from XBRL use from the European financial report receivers, these challenges are such that XBRL could address as it will force the companies to abandon the still remaining paper and PDF processes and start working towards a fully digitalized future. It can be assumed based of the findings from the European report receivers

that it may take approximately four to five years until real benefits from the use of XBRL start to truly have an effect on the organizations’ operations.

The respondents will also be obliged to standardize their operations and define a lot of concepts already inside the company, which will contribute to a more efficient reporting environment with multiple parties working towards a common goal with a common language and definitions altogether. It seems also that XBRL will act as a driver for unifying the processes and strengthening the cooperation among different government officials. Systems for for example identifying and authorizing the respondents need to exist and support the processes in order to receive full benefits of using XBRL. Moreover, all the standards to be used in the taxonomy should be defined before developing the XBRL reporting in any organization to avoid any additional separate steps in the process. Finally, the increasing complexity of XBRL and the lack of experts on the areas should be acknowledged as a future challenge.

7.2 Organization

The organizational context in Tornazky & Fleischer’s (1990) original framework refers to the characteristics of the organization; firm size, managerial structure, degree of formalization and other descriptive measures. For the purpose of this study, the organizational characteristics, technology management processes and evaluation practices for IT system implementations namely, are in the focus. Both the Finnish and European report receivers seem to have unique technology management practices with variable amounts of specified processes. No clear link can be found between a specific technology management practice and the success of XBRL adoption. However, it is still interesting to investigate the current practices at the Finnish organizations and compare them to the ones at the European counterparts to predict how easily and with what amount of effort XBRL can be introduced to the Finnish organizations in the future.

All three Finnish case organizations state that no one single clear technology management process exists in their organization. Tuomas Paavola from Statistics Finland describes the organization as “ran by the chiefs”, directors are making decisions of everything but there is no technology management process by definition. Every new upgrade is done as part of a project and Statistics Finland is currently planning to implement defined groups to handle any

future technology briefcases. Sakari Kauppinen from National Board of Patents and Registration Finland explains that the organization has its own IT department that is controlled also at operational levels. At the end of the day, high level management is responsible for any final decisions. Likewise to Statistics Finland, also NBPR implements any new upgrades as part of a project, for which specific goals and a defined budget are set. Tarja Rautio from Finnish Tax Administration refers to the yearly round of operational planning when describing the IT management process in their organization. Each operational unit prioritizes the most important changes from an operational point of view. Any new IT implementations are reviewed in an ICT planning group consisting of the chief IT offices and the heads for development.

The Finnish case organizations don't have any specified, recurring practices for evaluating the success of new IT implementations. Tuomas Paavola from Statistics Finland says that the success is evaluated lightly and rather reactively than proactively – only if there is a drop in hours spent for the operations for example. All in all, there seems to be no clear evaluation practices as Paavola mentions that auditing is the most significantly used evaluation method for the success and functionality of IT systems. Sakari Kauppinen from NBPR says that success is evaluated against the specific project goals set for any new project. Most of the goals are set for the final outcome of any project, however, also smaller milestones to achieve are set for larger projects. Kauppinen notes that the XBRL project is unique and has its own specific practices as it is realized together with multiple government parties: the project is conducted together with Finnish Tax Administration, but actually Valtori is the instance who is responsible for the execution of the project. Likewise to Statistics Finland, also Finnish Tax Administration seems to not have any defined process for evaluating the success of IT implementations. However, Minna Rintala notes that the cost and efficiency analysis in their organization has been improved lately and can be used also in evaluating the success of the implementation projects.

Similarly to the Finnish case organizations, also the European ones seem to have very unique and variable processes and practices for IT management. Frans Hietbrink from Netherlands Tax & Customs explains that instead of one unified process for managing IT implementations, there exists several processes, out of which a suitable one is always chosen based on the specific characteristics of each project. Project management, agile and scrum methods are mentioned. Bertrand Jadoul from the National Bank of Belgium describes a process that resembles the yearly round of operational planning mentioned by Tarja Rautio

from Finnish Tax Administration. A new implementation project is introduced each year for which specific targets and a budget are set. The suggestion for any new project comes from the operational units and needs to be approved by the board of directors. Similarly to Netherlands Tax & Customs, also at the Danish Business Authority is managing IT implementations in an agile or scrum environment. The IT management, according to Niels-Peter Ronmos, is very tight, even “horrible” as everything needs to be documented into as much as four different environment systems. Altogether the IT architecture is very large and well orchestrated with specific departments for different purposes such as designing and service improvement.

With regards to the evaluation of the success of new IT implementations, the European case organizations resemble the Finnish ones: the success is being evaluated to some extent, however not using any recurring practices of defined measurements each time. Frans Hietbrink from Netherlands Tax & Customs states that the success is evaluated at either IT system or project level and measures such as higher taxes, less complaints received or less employees needed are used to quantify the success. Bertrand Jadoul from the National Bank of Belgium, then again, explains that the success is evaluated against the pre-defined project goals – a project closure document is mirrored against these goals and used to measure the achievement of the targets. Niels-Peter Ronmos from the Danish Business Authority ensures that the success of IT system implementations is evaluated, reminding of the agile and scrum methods used in the organization, of which evaluation is a crucial part of. Ronmos, however, does not state any one clear method or set of tools and practices for measuring the success of new IT introductions.

It becomes apparent from the above chapters that the success of any new IT implementation or a new XBRL implementation specifically, is not necessarily dependent of the management practices at the organization. Each organization experiences its own specific challenges and it seems that it is viable to adapt processes and practices to each different situation, project by project. Tuomas Paavola From Statistics Finland wishes for more responsibility and clearer project ownership in the future. In the case of XBRL adoption in Finland, the project and implementation will be special also because many different government and other instances are involved. The adoption of XBRL in Finland is a common project between the financial report receivers and altogether can contribute positively not only towards a more efficient, digitalized and unified reporting environment from the report receivers’ point of view, but also to an easier and better functioning one from the point of view of each party in the

information supply chain: the providers, systematizers and intermediaries. For this type of project, it will be necessary that pre-defined management practices and evaluation systems exist. Moreover, they would need to be consistent within the different organizations involved and communication between these instances should be clear.

Each European case organization described the XBRL implementation as successful. However, no specific organizational characteristics or managerial practices can be linked to this success as the practices vary by organization as well as country by country. A more distinguishing factor affecting the adoption of XBRL in the European case organizations seems to be the external environment in which the adoption happened. The characteristics of each environment will be discussed in the following chapter.

7.3 Environment

The environmental context in Zhu et al.: s (1990) TOE framework is the area in which a firm operates its business: the industry, competitors, the government and the access to the supply of external resources. For the purpose of this study, the environmental characteristics that might affect the adoption of XBRL in Finland are of special interest. An opinion from each interviewed Finnish public organization about the implementation of XBRL was asked. Moreover, each European report receiver was asked to describe the environment in which XBRL was implemented in their situation.

As a mandate for XBRL financial reporting is being planned in Finland and as it is predicted to become effective in 2016, it is reasonable to investigate the environment and overall atmosphere in which this introduction will be made. In general, each Finnish case organization is positive about the future adoption of XBRL. However, there are certain characteristics and requirements that affect the adoption of XBRL that should be taken into account.

Tuomas Paavola from Statistics Finland reminds that their orders come directly from EU or other high officials and there is not much possibilities for changing any of the existing concepts or classifications. He admits that XBRL could address some of the challenges in the current process, however, he also sees a possible new challenge appearing if for example the tax office would require one concept or classification and Statistics Finland another. This would mean that the respondent would need to file in two different types of formats. A

solution for overcoming this possible problem would be unifying all concepts and classifications among the different government offices.

Sakari Kauppinen from NBPR sees XBRL most of all as one part of the change towards a more digitalized society. He sees XBRL as the most popular tool to use in working towards this goal and thinks that it is a good idea. Kauppinen sees XBRL as a solution to tackle the current challenges in the financial reporting process. He also sees the increasing rate of digitalization as a good tool for guiding the respondents' behavior.

Also Tarja Rautio from Finnish Tax Administration is very positive about the future XBRL adoption. She sees it most of all as a method for getting the data from the financial reports in a structured format, and at some point of time XBRL could also be harnessed in the tax audits. Rautio highlights the possibility for efficient further processing of the data when it is handled in a structured format. It would be easy to distinguish for example which companies' information needs further checking and which not.

Minna Rintala from the Finnish Tax Administration, then again, emphasizes the benefits from the respondents' point of view: at the moment, the respondents are obliged to fill many different reports for the government purposes – it would be more reasonable if the respondent could only fill one form that would then be distributed among the report receivers by themselves. Rintala thinks that the current systems are already sufficient from the viewpoint of the Tax Administration - getting the benefits arising from digital processing from XBRL is a longer term outcome as it requires processing large volumes.

The internal environment for the adoption of XBRL in the European case organizations was positive in each case – all organizations introduced XBRL in their financial reporting processes voluntarily, without any third party pressure. However, there were still forces in the external environment that affected the implementation in each of the case countries. Frans Hietbrink from Netherlands Tax & Customs describes the external pressure coming from the market, wishing to reduce the administrative burden for the respondents and software developers especially. Moreover, there was pressure from the market for making the already implemented XBRL mandatory for the whole society. Each party involved was positive about the adoption but still the individual parties did not commit fast enough and thus a mandate became necessary.

Likewise to Denmark, also in Belgium the market was positive about the adoption of XBRL and believed in its possibilities and potential benefits. The major challenge was to provide

XBRL reporting that would be also user friendly. The Central Balance Sheet Office at the National Bank of Belgium saw the opportunity and decided to become a driver for the XBRL adoption. First, a non-profit organization was created to support the adoption and convince the other parties involved about adopting the standard: the ministry of economy and ministry of finance for example.

In contrast to Netherlands and Belgium, Denmark experienced negative market pressure towards the adoption of XBRL. Although the Danish Business Authority itself was willing to adopt XBRL voluntarily, it had to fight against a lot of disbelief and negative pressure from the other parties involved in the introduction: the auditors and companies namely. According to Niels-Peter Ronmos, even the non-profit organization, XBRL Denmark was against the adoption. With the help of a strong alliance with one book keeping company, the adoption turned out to be a success after all. This book keeping company, unlike the other players in the market, was willing to implement XBRL voluntarily, became satisfied of the results and therefore were able to act as a reference for the other parties.

The above chapters show that although the internal environment for XBRL adoption in each Finnish organization is positive, there are also external forces and market pressure that will certainly affect the adoption enormously. Of course Finland will be different to the European case countries in that it will (although willingly) adopt XBRL as mandated. The whole adoption needs to be thought from the perspective of all parties involved. All the public organizations and software developers would together need to work towards a common goal with unified targets. Moreover, the respondents would need to be convinced about the benefits of the XBRL adoption. All the different parties involved should be convinced about the possibilities XBRL has to offer. Although it can be seen from the Danish case that XBRL can be adopted successfully also in a negative market environment, a positive one is certainly the more preferred one and thus strong arguments for the beneficiality of XBRL are required.

8 Conclusion

The main purpose of this thesis was to investigate the potential business value of the structured XBRL reporting language for the Finnish report receivers, focusing on the adoption of the technology. To reach this goal, the existing financial reporting process at the Finnish case organizations was first investigated and then mirrored to the XBRL financial reporting process in the European case organizations. Assumptions on the future potential business value for the Finnish public authorities were formed by comparing the current situations between Finland and the European countries already using XBRL. The research questions as formulated in the beginning of this research were the following:

- What is the potential business value of the structured XBRL reporting language for the Finnish report receivers?
 - What are the existing challenges in the financial reporting processes in Finland and how can the XBRL standard address them?
 - What benefits can the Finnish report receivers expect from XBRL based on what has been already achieved in other European countries?

In addition to answering the main research question by predicting the potential business value of the XBRL reporting standard, this thesis forms an understanding of the current financial reporting processes and practices at the Finnish public authorities. Potential challenges in the current processes are investigated and the willingness of the internal environment to adopt XBRL is researched. Moreover, the resulting benefits from using XBRL at the European case organizations are listed and also a timeframe for these benefits to appear is suggested.

The theory base of the thesis comes mainly from literature concerning the business value of IT. More specifically, the concepts of network effects as well as quality of information were seen relevant for the purpose of this thesis. These two concepts together with a thorough explanation and summary of the existing research on XBRL form the theoretical part of this study. In addition to investigating these theories alone, a number of previously used models and frameworks that have been used in the IT business value research are reviewed. Out of these models, the Technology-Organization-Environment (TOE) framework by Tornazky et al. (1990) has been chosen as the most suitable one. This framework was selected due to not only its flexibility and applicability to different concepts, but also after investigating its previous use and finding out that it had been already used in XBRL research multiple times.

The TOE framework was used mainly to select themes for the interviews in the empirical part of the thesis. Four different government officials involved in the XBRL projects at three different Finnish business authorities as well as three XBRL experts from three European business authorities were interviewed in total. The three Finnish case organizations were Statistics Finland, National Board of Patents and Registration Finland and Finnish Tax Administration. The three European public authorities, then again, were Netherlands Tax & Customs, the National Bank of Belgium and the Danish Business Authority. Three different countries were chosen to form as wide an understanding as possible of the resulting XBRL benefits and potential business value.

A loosely applied grounded theory method was used to group the findings from the exploratory qualitative research into different silos. First, the findings were divided into “Financial Reporting Process and Current Technologies Used” and “Organizational Characteristics Affecting XBRL Adoption” for both parts of the empiria – the first part concerning Finnish case organizations and the second part targeted to the European case organizations. Moreover, the European case organizations were asked to describe the implementation, benefits and value of XBRL in their organization in detail – these findings were grouped under “XBRL Implementation” in the second part of the empiria.

Finally, in the discussion part, the findings were discussed using again the TOE framework as a lense. The concepts of “Technology”, “Organization” and “Environment” were used as explanatory factors that may affect the adoption of XBRL in the Finnish case organizations. It was found that most of the potential business value resulting from the use of XBRL is related to better accessibility and understandability of the data. When the data is in a machine readable format, it is easier to disseminate and distribute among different government officials. The burden from the respondents’ point of view also diminishes when each government official uses common specifications and concepts in their reporting. According to the research, the business value of XBRL results from better accessibility and understandability of the data as well as easier dissemination of it. No monetary or financial benefits from the use of XBRL were found in the research.

9 Limitations and Suggestions for Future Research

Although this study reached its goal in investigating the potential business value of the XBRL reporting standard by benchmarking to the practices and outcomes for the more advanced European countries in XBRL use, it is still not without limitations. The study is completely qualitative in character and even though qualitative research can bring very valuable contribution to this research topic, including some quantitative data would bring even more reliability for the study. As the case organizations were very different in terms of organizational characteristics, size and level of XBRL implementation, the search for any quantifiable data was left out of the scope of this research.

Qualitative research usually involves a relatively small number of participants, which is the case for also this study. Due to the small number of participants (7), no generalizations can be made based on this research. However, as also the area of concentration for this study is very narrow, it can be argued that all the relevant actors have been included and interviewed. From Finland, all the three main public organizations receiving financial reports and having the potential to implement XBRL in the future were approached and questioned. What comes to the European counterparts, a comparable number of informants were selected from different countries advanced in XBRL. Multiple other European countries were selected for the benchmarking purpose to understand the potentially differing country-specific benefits achieved from XBRL reporting. Moreover, all the interviewees selected for this study can be considered experts on the research topic and the information gathered from them to be accurate and rich. Given these facts, the data gathered for this study from the small number of participants can be considered valuable for the purpose of this specific study.

An interesting field of study in the future, when more time has passed, would be to investigate the quantitative benefits from XBRL adoption – for example cost savings, personnel reductions, efficiency improvements namely. It would also be interesting to investigate the change in these factors in Finland as the report receiving public authorities start the XBRL implementation in a few years' time. Another interesting field of study would be the business value of XBRL from the respondents' point of view. Already in this study, it became apparent from both the Finnish and European report receivers that one of the main goals for adopting XBRL is to reduce the response burden from the customer side. Lastly, it would be valuable to compare and collect “best practices” and resulting value from even

more countries that have implemented XBRL all over the world to form a thorough understanding of how to conduct the implementation and what can be expected from it.

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