

# THE FACTORS IMPACTING THE DIFFUSION OF INNOVATION IN DIGITALISING ACCOUNTING

Accounting  
Master's thesis  
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2010

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ACCOUNTING

Objectives of the study

The goal of the study was to find the factors impacting the diffusion of digital accounting and electronic invoicing. Previous studies have focused on the attributes of the innovation and studied innovations with the assumption that they are efficient. This study has taken into account also the impact of actions as well as internal and external factors and brought in the considerations of the diffusion of inefficient innovations and divided the factors into motivations and hindering and supporting factors.

Research method and data

The diffusion of digital accounting is viewed as a change process. The study method consisted of 12 semi-structured interviews with experts on digital accounting from six listed companies who already are starting to send and receive electronic invoices. This was supported by observations made in meetings of the FIA project, where several important external parties involved in the diffusion process like operators, solution providers and other facets promoting e-invoicing, were represented. The results from the interviews were connected to the observations and compared to existing research and viewed in the light of the existing theory.

Findings

The impacting factors are not limited to the attributes of an efficient innovation even though it has been the focus of existing research. The most important motivations are the perceived efficiency of the innovation and harmonisation. The efforts for standardisation, co-operation networks and the development of accounting systems and organisation were found to be the most important supporting factors whereas problems in standardisation and finding efficient SME solutions as well as change resistance and the lack of a responsible authority and competing non-digital solutions were seen as the worst hinders for the diffusion.

Key words

e-invoice, digital accounting, diffusion of innovation, accounting change

## INNOVAATION DIFFUUSIOON VAIKUTTAVAT TEKIJÄT TALOUSHALLINNON DIGITALISOINNISSA

### Tutkimuksen tavoitteet

Tutkimuksen päämääränä oli kartoittaa digitaalisen taloushallinnon innovaation diffuusioon vaikuttavia tekijöitä. Aiemmat tutkimukset ovat käsitelleet verkkolaskua lähtökohtaisesti tehokkaana innovaationa ja tutkineet sen käyttöönoton syistä lähinnä innovaation ominaisuuksia. Tämä tutkimus pyrkii tuomaan asiaan lisätietoa ottamalla huomioon, että verkkolasku ei välttämättä ole tehokas innovaatio ja että sen käyttöönottoon voivat vaikuttaa myös sidosryhmien toiminta sekä sisäiset että ulkopuoliset tekijät. Nämä tekijät on tutkimuksessa luokiteltu motivaatiotekijöihin sekä diffuusiota tukeviin ja hidastaviin tekijöihin.

### Tutkimusmenetelmä

Innovaation diffuusio nähdään tässä tutkielmassa muutosprosessina vahvasti institutionalisoituneessa ympäristössä. Tutkimuksen empiria koostuu 12 asiantuntijahaastattelusta kuudessa pörssiyhtiössä, jotka ovat ottaneet tai ottamassa käyttöön sekä verkkolaskujen lähetystä että vastaanottoa. Haastattelujen tueksi tutkija osallistui FIA hankkeen puitteissa kokouksiin, jossa oli läsnä useita merkittäviä verkkolaskutuksen diffuusioon vaikuttavia ulkoisia tekijöitä, kuten operaattoreita, ohjelmistotoimittajia sekä muita verkkolaskutuksen edistämiseen pyrkiviä tahoja. Haastattelujen tuloksia käsiteltiin yhdessä kokouksissa tehtyjen havainnointien kanssa ja näitä verrattiin aiempiin tutkimustuloksiin sekä tarkasteltiin suhteessa olemassa olevaan teoriaan.

### Tutkimuksen tulokset

Innovaation diffuusioon vaikuttavat tekijät eivät siis rajoitu vain tehokkaan innovaation ominaisuuksiin, vaikka aiemman tutkimuksen fokus on ollut nimenomaan niissä. Tärkeimmät motivaatiotekijät ovat innovaation koettu tehokkuus ja hyödyt joita innovaation koetaan tuottavan harmonisoinnin kautta. Standardointi, yhteistyöverkostot sekä laskentajärjestelmien ja organisaatioiden kehittyminen ovat tärkeimpiä diffuusiota tukeneita tekijöitä siinä missä ongelmat standardoinnissa ja pk-yritysratkaisujen löytämisessä olivat suurimpia hidasteita yhdessä kilpailevien ei-digitaalisten ratkaisujen sekä asiasta vastaavan viranomaisen puuttumisen lisäksi.

### Avainsanat

Verkkolasku, digitaalinen taloushallinto, sähköinen taloushallinto, innovaation diffuusio, laskentatoimen muutos

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# 1 INTRODUCTION

The aim of this research is to find the factors impacting the diffusion of digital accounting and electronic invoicing in Finland. In the academic accounting literature, digitalization of accounting and electronic invoicing, have hardly been recognised despite a few mentions along other technological advances. (see Burns and Vaivio, 2001, p. 389; Penttinen et al., 2008) As very little previous literature exists on the subject, the search for motivations and other impacting factors for the phenomenon are supported with theories on diffusion of innovations, accounting change, institutionalization and actor-network theory. The research is part of a larger entity of information gathered for the Fully Integrated Accounting (FIA) project of the Real-time economy community.

E-invoicing and e-commerce are the talk of the day for both companies and consumers. Still the spreading of these new technologies seems to move forward somewhat slowly in the eyes of many of the instances involved. For example the Finnish Funding Agency for Technology and Innovation, Tekes has funded two large projects that solely aim at promoting and developing the electronic solutions further: VEKE (verkkolaskun kehittäminen = the development of electronic invoices) is one of the projects and the Real-time economy project, which this thesis is a part of, is the other. The Finnish Information Society Development Centre Tieke<sup>1</sup> has also held a number of events and projects promoting these technologies.

Even the Finnish minister of “traffic and communication” set up a team to do research on the progress and benefits of the use of electronic invoicing and raise Finland to be one of the leading countries among the adopters of these technologies.<sup>2</sup> The project is a part of the Finnish solution for reducing the administrative burden<sup>3</sup>, which is a common set of principles with country specific goals set at EU level. A lot of the promotion material and research done

<sup>1</sup>The Finnish Information Society Development Centre has a key networking role as a neutral and non-profit organization. It promotes the efforts of its public and private sector members to create viable tools and expertise for use in the information society. ([http://www.tieke.fi/in\\_english/](http://www.tieke.fi/in_english/) accessed 21.4.2009)

<sup>2</sup> See Arjen tietoyhteiskunnan neuvottelukunta, 2009

<sup>3</sup> The Finnish translation is hallinnollisen taakan keventäminen

to further the use of electronic commerce has been dealing with the financial benefits that can be reached through these technologies<sup>4</sup>.

In the media the innovation has been promoted mostly with cost savings<sup>5</sup>. According to Penttinen et al. a paper invoice costs 30-50 Euros whereas an electronic invoice costs only 10 Euros which can be lowered with fully automated invoice processing to only one Euro. (Penttinen et al., 2007, p. 4) This has been calculated to create a savings potential of 243 billion Euros on a European scale in B-to-B invoicing. (European e-Invoicing final report, 2007, p. 9) Though the benefits shown seem to be significant, somehow they have not been able to convince the masses of potential adopters to start using the available technology. This is a major problem due to the fact that the potential benefits to be achieved from electronic invoicing etc. follow similar pattern as the use of phones. It does not do you much good if you are the only one using it, but each and every new user benefits all adopters.

The empirical part of the research is based on interviews of experts of digital accounting in large Finnish companies and observations of project meetings and conferences from the supply side of digital accounting solutions. The results are compared to existing academic and corporate research and analysed with through the theorisations.

### **Research limitations**

In this thesis most of the examples and statistics used to illustrate the diffusion of digital accounting are results from studies on sending and receiving electronic invoices. This is because these two processes are essential in order to do digital accounting efficiently<sup>6</sup>. Incoming and sent invoices are also the common exchange of information on paper between companies and the automation in handling these documents, is expected to produce a significant part of the benefits of digitalization at least in this phase of the digitalization process. (Deutsche Bank, 2009) Another reason for the use of this exemplary information is

<sup>4</sup> See for example [http://www.tieke.fi/verkkokaveri/teemat/taloushallinto\\_ja\\_verkkolasku/](http://www.tieke.fi/verkkokaveri/teemat/taloushallinto_ja_verkkolasku/) and 5

<sup>5</sup>See for example [http://www.tietokone.fi/uutiset/2006/verkkolaskut\\_kuluttajille\\_ensi\\_vuonna](http://www.tietokone.fi/uutiset/2006/verkkolaskut_kuluttajille_ensi_vuonna), [http://www.tietoviikko.fi/taustat/kaikki\\_jutut/article132674.ece](http://www.tietoviikko.fi/taustat/kaikki_jutut/article132674.ece), <http://www.taloussanomat.fi/pdf/200322145>, [http://www.ek.fi/www/fi/uutiset/index.php?we\\_objectID=8425](http://www.ek.fi/www/fi/uutiset/index.php?we_objectID=8425) and <http://www.kauppalehti.fi/5/i/talous/uutiset/avoinkarto/index.jsp?xid=2154337&date=2006/11/30>

<sup>6</sup> See attachment 5 for a basic illustration of a comparison of the process on paper and digitally

that there is much clearer and reliable information available of electronic invoicing than there is of fully integrated and digital accounting. The poorer quality of the latter for research purposes results from possibilities of different interpretations concerning digital accounting and the fact that so few if any companies can so far produce digital accounting as it is defined in this thesis.

This research also acknowledges that digital accounting can build upon many processes that are not specifically dealt with in depth within this thesis like e.g. sales and purchase orders, inventory calculation or for instance salary calculation. This exclusion has been done because the process of digitalizing these functions is not as strongly connected to digital accounting as electronic invoicing is. Moreover the development of digital accounting beyond the invoicing-payment process is mostly an internal process within systems of the case companies. In addition the mentioned processes more rarely concern the SMEs. Thus those sections have been left out of the research focus as the diffusion of innovation for these parts is possibly very different from that of electronic invoicing.

Also the focus of this thesis is on B2B electronic invoicing. This exclusion rules out consumer e-invoicing, which is also currently diffusing rapidly. (Koch, 2008 p. 11) Nevertheless it is acknowledged that the spreading of e-invoicing among consumers can have an impact on the diffusion of B2B e-invoicing and the digitalization of accounting. Furthermore the aim of this thesis is not to produce a universal theorisation that would apply for all future innovations. The focus is in explaining the chosen phenomena and finding the impact factors behind it. (Abrahamson, 1991, p. 606-609)

Digitalisation of accounting in B2B transactions is a new phenomenon in both research and practice. However the subject is very timely and a lot of efforts have been put to the promotion of the phenomena even on a national scale. This thesis aims to bring up additional knowledge to improve the understanding of the phenomenon of the diffusion of digital accounting.



## 2 THEORETICAL FRAMEWORK

As already mentioned in the introduction, very little research exists, especially in academic literature, concerning digitalising accounting and electronic invoicing. Thus in this research we try to find the factors impacting this phenomenon through a combination of existing research and articles on accounting change, institutionalisation, diffusion of innovations and actor network theory. The existing academic research on the subject is focused on the attributes of the innovation (see for example Penttinen and Hyytiäinen, 2008 and Sipilä, 2008). However even research executed by businesses it has been noted that much of the benefits of e-invoicing rely on streamlining the invoicing process – not on sending electronic invoices per se. (Deutsche bank, 2009) Hence this thesis takes into account sources of impact factors beyond the innovation itself.

Digital accounting and electronic invoicing are innovations that have an effect on how accounting is done in that they provide whole new opportunities in the gathering and processing of information for the needs of the company. Thus the factors that impact the diffusion of these innovations might be similar to those found in studies of other accounting innovations like ABC or BSC that have initiated changes in accounting. Similarly as the accounting environment has been described as a heavily institutionalized one (Scapens, 1994) it is possible that institutional factors are also influencing the diffusion. Based on earlier research and the subject in question, the theory of diffusion by Roberts (1983) cannot be disregarded. As Roberts theory focuses on the diffusion of efficient innovations, to find the factors impacting the diffusion of inefficient innovations further diffusion studies by Abrahamson (1991) are included in the theorizations referred to in this thesis.

### 2.1 Theorisations on diffusion of digital accounting

#### **Change in accounting**

The adoption of new innovations in accounting processes requires change. Because this research is done to find the factors impacting the diffusion of digital accounting and electronic invoicing, it is necessary to understand the process of accounting change. Attention to the change process has been called for also in the academic literature. (Alcouffe et al., 2008, p. 2)

In accounting literature nowadays there seems to be a consensus that accounting has changed and will continue to do so. (See for example: Burns and Vaivio, 2001; Hopwood, 1987)

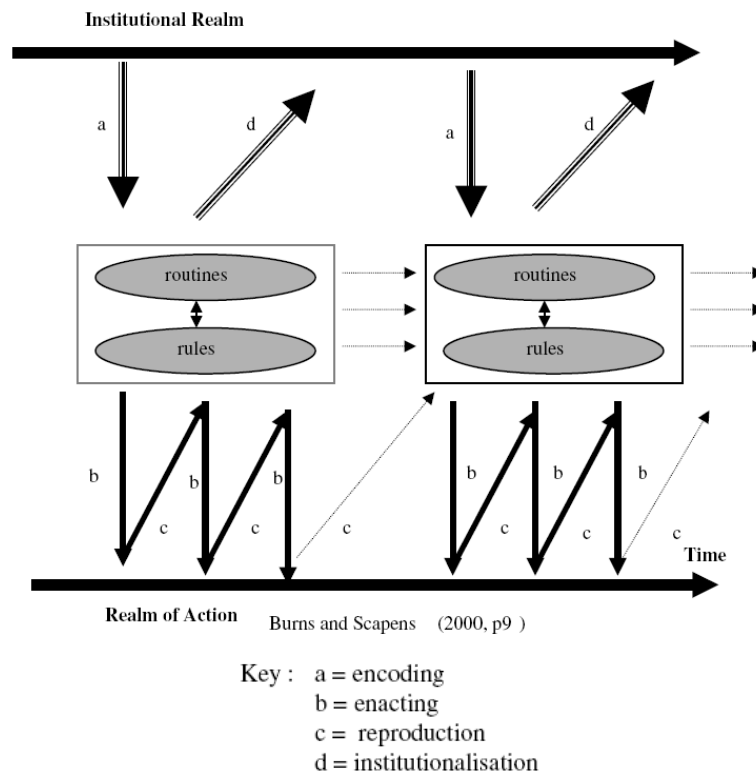
The changes in accounting processes and the roles of accounting personnel are can be illustrated with help of the following quote from Burns and Vaivio:” Routine accounting tasks (e.g. transaction processing and statutory reporting) will continue to demand a small (and declining) number of ‘specialist’ accountants who can rely on the technology to do the bulk of the work.” (Burns and Vaivio, 2001) The development can be seen as a chance for the accounting people to become more than just number crunchers. The changes in IT systems and the process of accounting are highly important because they have the possibility to lead changes in the roles and even the structure of the accounting organization. (Busco et al 2007, p. 138-139)

Global and international companies are unifying their operations, which is diminishing national cultural differences between companies and countries. Through this action new accounting practices are diffusing faster than ever. At the same time accounting legislation is gradually becoming similar both under the influence of governments and multinationals. (Granlund and Lukka, 1998y) In the case of e-invoicing, the international development is getting support both at a national and EU level. (Final report, European Expert group on e-invoicing, 2009)

The factors influencing accounting change are in the academic literature often divided into internal and external influences, sometimes so that the external influences are entirely left out of the scope of research. Here the both sides are included because to achieve a wide picture of the diffusion of an innovation, leaving out the external influences is leaving out too much. (Miller and O’Leary, 1990, p. 481, 495)

## The process of institutionalization

Institutionalization happens when the process is done again and again with the same methods and thus change can be said to happen when this chain on continuity, a routine, is broken and the process transforms. (Soin et al., 2002, p. 254)



Picture 1. Institutionalization by Burns and Scapens (2000)

The above figure represents the process of institutionalization by Burns and Scapens. The description is based into a division between two realms. The realm of action is separated from institutional realm and they are linked with the processes of encoding, enacting, reproduction and finally institutionalization. Encoding means that the existing rules will contain the prevailing institutional principles, which will shape the new rules that will lead to the creation of new rules. Arrow b describes the enactment of the rules and routines formed. Here also resistance to change may happen if the persons supposed to enact the new rules and routines have the possibility. Also the choice of enacting can be a conscious or an unconscious one. The arrow c describes the repetition of before mentioned enactment, when change can also happen by choice or “by accident” if the routine is not reproduced similarly along time. This can happen especially when the repetition of the process is not supervised. In phase d institutionalization occurs when for example a routine is disconnected from its history and

reproduced because it is the way things are and have been done. (Burns and Scapens, 2000 p. 10-11)

Thus the institutionalised rules and routines that are in place, are important to understand as a part of the circumstances that shape both the innovations and their way of adoption by creating path-dependencies for the solutions to suit the needs of each individual company. (Burns and Scapens, 2000, p. 12) This happens fairly naturally because the diffusion of innovation in digital accounting does not mean replacing an entire process. Only parts of the accounting process are modified so that the new procedures have to fit in with the old ones in order to be adopted.

### **Diffusion research**

The core of the diffusion theory by Roberts is that the factors explaining the different rate of adoption of innovation are the characteristics of an innovation. Rogers has categorised the characteristics into five sections: relative advantage (how much better the innovation is conceived to be compared to the innovation that it supersedes), compatibility (is the innovation compatible with the values, past experiences and needs of potential adopters), complexity (the degree to which the an innovation is seen as complex and difficult to use), trialability (the extent to which an innovation can be tested and experimented on a limited bases) and observability (the extent to which the results of an innovation can be seen by others<sup>7</sup>). (Rogers, 1983, p. 14-16)

Gabriel Tarde was one of the grandfathers of diffusion field in Europe. He observed that the rate of adoption of a new idea follows an S-shaped curve. He also thought that the S-curve is explained by networks, as innovations were, according to Tarde adopted by the ones socially closest to the source of the idea. (Rogers, 1983, p. 40-41) The rate of adoption, which is illustrated by the S-curve, is “the relative speed with which an innovation is adopted by members of a social system”. “The rate of adoption is usually measured by the length of time required for a certain percentage of the members of a system to adopt an innovation.” By

<sup>7</sup> The easier the results can be seen, the more the innovation will be adopted. (Rogers, 1983, p. 14-16)

Rogers the adoption time varies because of the properties of the innovation and for example the differences in the social systems where the innovations are adopted. There are aspects of diffusion that cannot be explained by the nature of individual behaviour, but this can be explained through the direct influence of the system and an indirect influence of the individual members of the system, through the system. (Rogers, 1983, p. 23-24)

The shape of the S-curve can also vary depending on resistance to innovation as the early adopters can be weary and try to avoid the risk. Also a phenomenon called “the bandwagon effect” take affect as the mere amount of adopters starts to increase the speed of the diffusion. This phenomena which has also been called the diffusion effect, is the pressure created by the adopters or rejecters of an innovation for others to follow their lead in treating this innovation. (Rogers, 1983, p. 234) There are also results which show the existence of bandwagon effects in accounting solutions. (see for example Swan et al., 1999, p. 918)

The adopters of an innovation can be divided into five groups: innovators, early adopters, early majority, late majority and laggards based on at which point of the S-curve or the more commonly used bell shaped curve, are they adopting the innovation. (Rogers, 1983, p. 242-250) The bell shaped curve, also known as the lifecycle model of diffusion of innovation can be described by normal distribution. There the share of innovators is 2,5%, early adopters about 13,5%, early majority 34%, late majority 34% and laggards 16%. (Rogers, 1995)

In the academic literature, the spreading of the diffusion can be divided into two types. Relocation where diffusion happens when an idea or for example a person enters a new place. In this case the innovation spreads, but the number of adopters does not necessarily increase. Expansion is the type of diffusion where more and more people or companies etc. adopt the innovation and thus the number of users always grows when the innovation diffuses. (Bjørnenak, 1997, p. 5)

Expansion diffusion can be further divided to contagious and hierarchical diffusion. There contagious diffusion is closer to the thoughts or Gabriel Tarde stating that diffusion of innovation is highly dependent on the networks so that the subjects closest to the origin of the innovation are most likely to adapt it first. This is also the diffusion model used to explain or model the spread of diseases or rumours. (Bjørnenak, 1997, p. 5) Expansion diffusion can also be classified as hierarchical where the diffusion starts from larger units moving on to medium

size<sup>8</sup> and finally small units. The base of the hierarchy can vary so that it could be based on the size of a company, or a city or also on the amount of income. (Bjørnenak, 1997, p. 6)

In addition to analysing the diffusion in a company as one unit, analysing internal diffusion can also provide additional insight on the process. Internal diffusion refers to the time it takes for an innovation that has been adopted by the company to replace the previous solution as a practice throughout the company. (Mansfield, 1963) For example when a company starts to receive invoices electronically, it takes time for all the personnel of the company to see the e-invoices as a standard practice and ask for them from all its suppliers.

The first and most commonly met criticism for diffusion research is the pro-innovation bias. Rogers defines it as follows: “The implication of most diffusion research is that an innovation should be diffused and adopted by all members of a social system, that it should be diffused more rapidly and that the innovation should be neither re-invented nor rejected.”(Rogers, 1983, p. 92) Kimberly (1981) clears the idea by defining them as presumptions that innovations will benefit organizations. Rogers’ reasons for pro innovation bias are that most of the research has been funded by change agencies whose business is to promote ideas. Successful innovations also leave a diffusion trail that is easy to research where as innovations that get rejected cannot be easily studied. (Rogers, 1983, p. 93)

To overcome the pro-innovation bias Rogers suggest studies that concern innovations that are not yet completely diffused because this way the studies would not concentrate so much into the most successful innovations. (Rogers, 1983, p. 95) The early research on innovation did not recognise re-innovation or the fact that innovations are not the same for all adopters as they are often modified to suit the needs of the adopters in their particular situations. Nowadays innovations are not seen as perfect solutions for the problems and needs of the adopters. (Rogers, 1983, p. 98)

Abrahamson widens the diffusion theory by Roberts as he brings into consideration the diffusion of inefficient innovations and the rejection of efficient innovations. His approach

<sup>8</sup> When talking about the effect of the size of the company Bjørnenak also notes that it might not be as much about the size of the company but the size of the information field (IF) of the company. Mostly they are correlated, but differences are not highly unlikely.)

helps overcome the proinnovation bias associated with earlier research because it challenges the view that rational decision makers make independent decisions to adopt efficient innovations. This is accomplished by creating counter assumptions to the basic ideas underlying the efficient choice perspective (March, 1978 quoted by Abrahamson). For example the assumption that organizations within a group make their choices freely and independently can be countered by asking whether someone outside this group like regulatory bodies or consultants have had an influence on the decisions made by the group. The other main idea behind efficient choice is that organizations know their goals and the effect of each innovation in reaching these goals. This can naturally be countered by uncertainty concerning the goals and the effect of the adoption of innovations. Through the counter assumptions the following matrix is formed. (Abrahamson, 1991, p. 590-591)

<b>The theoretical perspectives explaining the diffusion and rejection of administrative technologies</b>		<b>The imitation focus dimension</b>	
		Imitation processes do not impel the diffusion or rejection	Imitation processes impel the diffusion or rejection
<b>The outside influence dimension</b>	Organisations within a group determine the diffusion and rejections within this group	Efficient choice perspective	Fad perspective
	Organisations outside a group determine the diffusion and rejections within this group	Forced selection perspective	Fashion perspective

Picture 2. The theoretical perspectives in explaining the diffusion and rejection of administrative technologies (Abrahamson 1991, p. 591)

These perspectives help classify the reasons behind the adoption or rejection of an innovation. Here the most important features are that the efficient choice is just one of the categories and that the matrix helps explain both diffusion and rejection.

Because it is unlikely that the practical process of diffusion of innovations would always fit in one of the boxes of the matrix drawn above, Abrahamson suggests two alternative ways of exploiting the theory and categorisation and so that it supports the empirical results. The first way is a “contingency resolution” where for example two perspectives can be put in order based on their explanatory power. This way the whole diffusion does not have to fit solely in

one category but it can also be supported by another. The other way is called a “paradox resolution” where a researcher can use the created categories by combining them in a way necessary to find the needed explanatory power and create new terms in order to find the right theoretical base to describe the diffusion or rejection in the given case. For example in Abrahamson’s original matrix, there is no place for an outside influence if it is not absolute in the way that it determines whether an innovation is diffused or not. In this case by combining the organizations freedom to choose which innovations diffuse and combine it with a significant outside influence a researcher can find a shoe that fits. (Abrahamson, 1991, p. 600-601)

### **Actor networks**

Another view that challenges the adequacy of the technical attributes of an innovation in explaining the diffusion or rejection of an innovation is “Latourian”<sup>9</sup> research based on actor network theory. “In this view, accounting innovations diffuse because they translate the changing and transitory interests of various groups of actors who are looking to maintain their position and influence within organizations and society.” (Alcouffe et al., 2008 p. 2)

The actor-networks are formed when actors that pursue the same goals rather than others, form alliances. The alliances can consist of both human and non-human actors and they grow stronger as they grow in numbers and they are seen as successful constructions if the innovation gains “a solid and sound appearance” and is “blackboxed” and thus not questioned for at least some time. The power of the actor-networks here seems to have some similarities with the bandwagoning effect discussed for example by Rogers (1983).

Research on the organizational networks has focused on mainly the formal networks, but the informal ones can be of importance as well. Collaboration between universities, professional organizations and even informal meetings between friends can have an impact on the diffusion of an innovation. (Lapsley and Wright, 2004, p. 356) The following picture illustrates the Real-time economy network, which is actively promoting the diffusion of digital accounting.

<sup>9</sup> “Followers of Latour (1987, 1993, 1996) are concerned with understanding accounting technologies in the context of networks of human and non-human ‘actants’. ...”( Baxter and Chua, 2003, p. 102)





Picture 3. Real-Time Economy network ([www.hse.fi](http://www.hse.fi), Penttinen, 2008)

However, the model by Alcouffe et al. suggests that in order for the innovation to diffuse, the following four actions are needed: “Problematization”, “interessement”, “enrolment” and “mobilization”. (Callon, 1986 quoted by Alcouffe, 2008, p. 3) Problematization calls for the actors to convince others of the superiority of the innovation, not necessarily by the technical attributes but also by ideals associated with the innovation. Interessement refers to the creation and strengthening of an interface that connects the different interests of various stakeholders. Different types of interessement were described as follows: “commercial (an innovation to sell), political (a response to national challenges), editorial (a topic to publish on), intellectual (a concept to teach and to research) or career enhancing (a distinctive expertise for professional managers)”. A variety of different types was found beneficial to the diffusion.

On the contrary to the other theorizations on diffusion quoted in this thesis, in this model enrolment is the perspective to the success or failure of the diffusion instead of a numerical

measure on the actual spreading of the innovation. This statement is founded on the logic that “the machine will work when all the relevant people are convinced”.<sup>10</sup> (Latour, 1987, p. 10, quoted by Alcouffe, 2008, p.15) This is reflected on the third action suggested by Alcouffe (2008) “Enrolment is the creation of alliance networks, the aim of which is to build up agreement among the stakeholders concerning their interests”. The last part called mobilization refers to the relationship of change and stability<sup>11</sup> so, that the interests of the stakeholders should remain relatively stable for the benefit of the innovation. Simultaneously it is mentioned that enforcing too much stability in the interests can end up hampering the diffusion as the process might require for the innovation too to adapt to different environments. (Alcouffe et al., 2008)

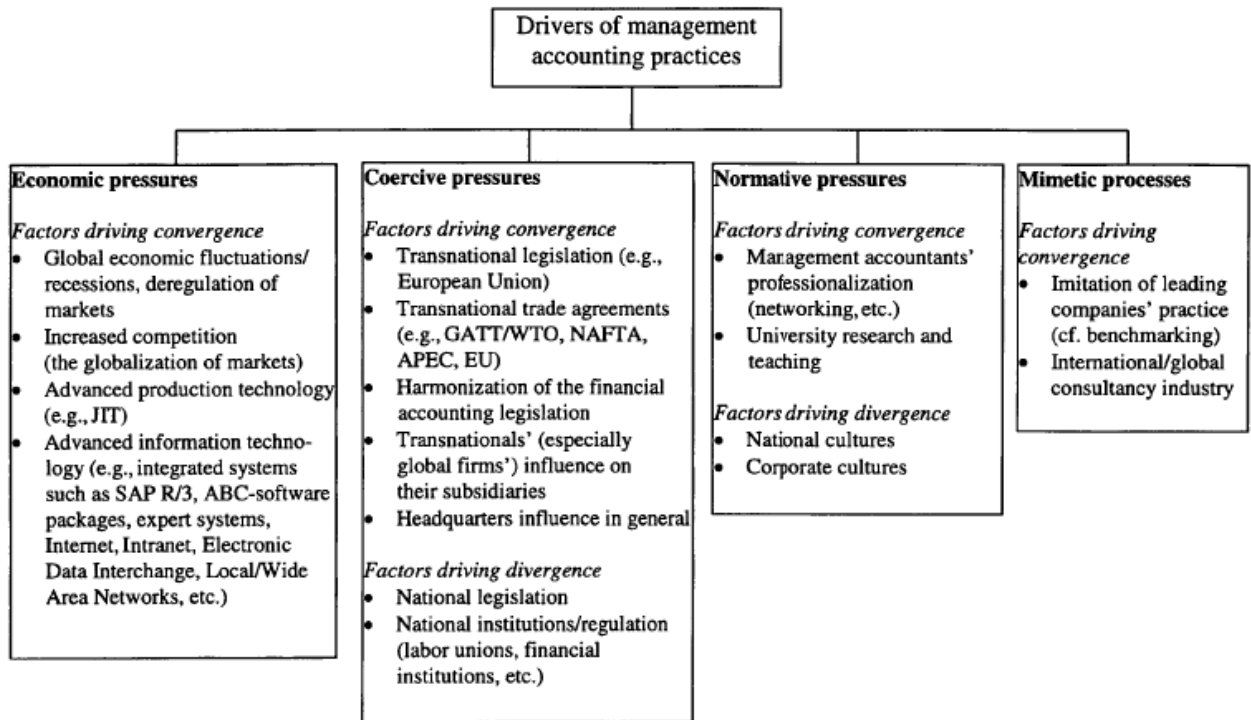
As the focus of the diffusion research has of ten been on the attributes of an innovation the actor network theory is helpful in directing the attention to potentially important factors outside the innovation itself. It also helps understand the impact of actor networks and their functioning on diffusion of innovation (an example of an informal network concerning digitalisation illustrated in the Picture 3).

## 2.2 Impacting factors based on existing research

To strengthen the categorisation by Abrahamson a model by Granlund and Lukka (1998) was also studied. In their study of convergence in management accounting practices they made quite a similar classification for the factors driving either convergence or divergence in the practices as shown in the figure below. (Granlund and Lukka, 1998y, p. 157) Additionally the drivers found in their research could be similar to the factors impacting diffusion in this research.

<sup>10</sup> This is opposed to: “Once the machine works, people will be convinced”.

<sup>11</sup> The complexities in the relationship between change and stability in accounting change processes have also been discussed by Burns and Scapens. (Burns and Scapens, 2000, p. 21)



Picture 4. Drivers of management accounting practices (Granlund and Lukka, 1998y, p. 157)

The research by Penttinen et al. (2008) made use of the criteria by Roberts resulting in a classification of the impacting attributes of an innovation in the diffusion of digital accounting. The research is in terms of the research question quite close to this thesis, but it differs in the way that the research by Penttinen (2008) makes the assumption that electronic invoicing is seen as an efficient innovation and also in the way that the research focuses as impacting factors solely on the attributes of the innovation. At least based on the research by Abrahamson (1991) the factors can also be other issues than simply properties of the innovation itself.

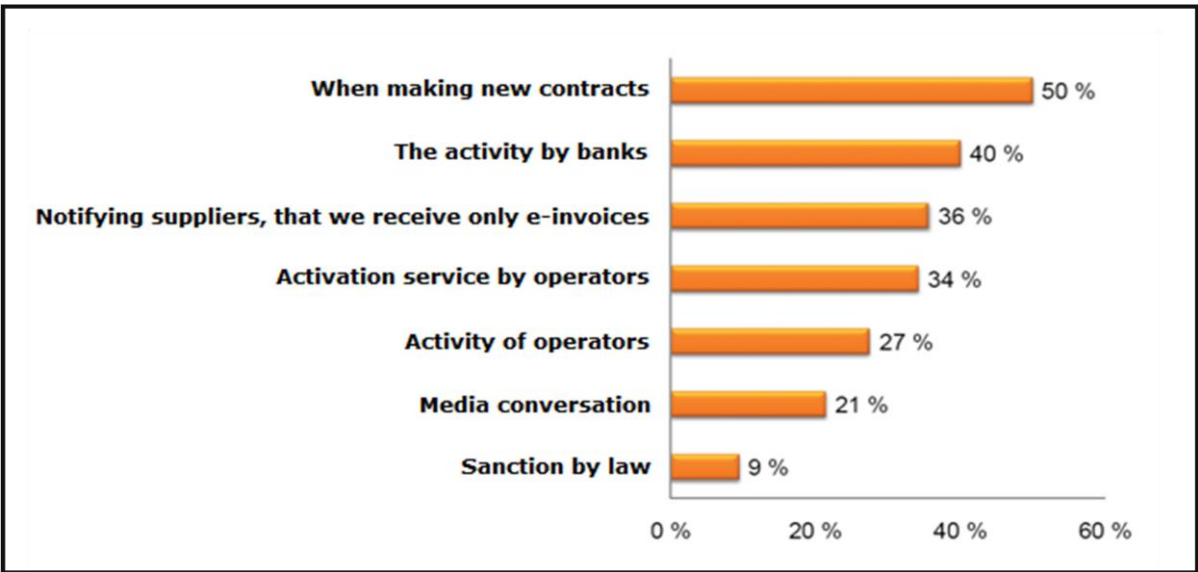
<b>Factors impacting the diffusion of electronic invoicing</b>	<b>Citation from the interview</b>
<u>Relative advantage</u>	“Two years ago, when contemplating the adoption of electronic invoicing, we made cold calculations about the costs and benefits of electronic invoicing, just over 30 Euros per incoming paper bill”
	“Scanning the paper bills to electronic format incurs costs to us so we want to increase the number of electronic invoices received”
	“By moving to electronic invoicing, we have been able to reduce the number of errors in invoices considerably.”
	“Health care bills are sometimes paid twice by the inhabitants of our municipality by mistake. When they want to get their compensation, it gets messy. Electronic invoicing can fix this problem efficiently.”
	“My work has shifted from copying and paper work to computer. I find it much more meaningful to work in this way.”
	“The circulation time of bills has decreased from one week to just two or three days in our company”
<u>Compatibility</u>	“When compared to the international invoices, it is very important that in Finland, we have these established standards, e.g., TEAPPSXML and Finvoice.”
	“It is important that the electronic invoicing interface is easy to use and looks like a paper bill.”
	“Technology must be compatible with the work processes, otherwise there will be too much errors.”
<u>Complexity</u>	“Transitioning to electronic invoicing should be easy.”
	“We would like to have one large German company to send us invoices in electronic format, but the German bank of that company cannot provide the invoice in right kind of format”
	“We should be able to centralize our invoicing. For now, we have multiple (7) invoicing departments”
	“We cannot get the required XML document from our current system and that is why we have not started the electronic invoicing of outgoing bills”
<u>Trialability</u>	“We found it important to have a good pilot company with whom we could test the electronic invoicing connection. In our case, it was a travel agency with whom we have a lot of invoicing on regular basis.”
	“When piloting the electronic invoice to the consumers (inhabitants of the community), it was clear that the electronic invoice had to contain all the information previously available on the paper bill. The continuity factor was very important here.”
<u>Observability</u>	“We want to project a positive, modern image of the public service”
	“Active information flow internally to employees is very important.”
	“We found that one of the most important factors is being active toward the client/supplier. The availability of the electronic invoicing possibility is stipulated in the contract. Taken up in the discussions with the client/supplier”

Picture 5. Factors impacting the diffusion of electronic invoicing (Penttinen and Hyttiäinen, 2008, p. 8)

Penttinen and Hyttiäinen (2008) categorised the perceived success factors into: management support, communication factors and technological readiness. In their results they highlight that the established standards were appreciated, activity towards clients and suppliers had a positive effect, systems were seen as a big enabler, internal communication was important as well as communication between different operators and for example management support and having a process owner were internally important factors. They also found benefits for using

e-invoicing like cutting costs, eliminating errors, increased transparency, better timeliness in reports and decreasing circulation time. Respectively they found problems such as electronic signature, ambiguity towards the removal of paper vouchers, new requirements to staff, internationalization, and difficulties in communication between operators and also in conversions between different e-invoice formats. (Penttinen and Hyytiäinen, 2008)

An inquiry made to 384 representatives of sales and purchase departments on e-invoicing produced the following results when they asked the respondents: What are the best ways for you to increase the number of incoming e-invoices?



Picture 6. The ways to increase the number of incoming e-invoices. (Basware, 2009)

Basware emphasized the importance of the co-operation between invoice processing and purchasing departments as the making of new contracts was seen as a good way to speed the diffusion.

2.2.1 Supporting factors

In the academic literature, the changes in accounting have often been seen if not as a direct result then at least as an issue facilitated by the development of information technology (IT). (Burns and Vaivio, 2001; Busco et al., 2006; Lukka, 2007; Orlikowski, 2000; Hopwood, 1978, Swan et al., 1999, p. 909) Especially the changes brought in by ERP systems have been

analysed and often the IT systems are seen as facilitators and drivers of change (Busco et al. 2007, p. 138-139). Some of the routine accounting tasks like entering invoices into IT systems and making payments are being centralised (Granlund and Lukka, 1998x) while other responsibilities as for example entering information about cost centres and project numbers etc is being pushed out to the business managers rather than accounting professionals. (Burns and Vaivio, 2001, p. 390)

Change in accounting has also many times been seen as a result of larger changes in the economy. (Atkinson et al., 1997, Busco et al., 2007, p. 125–149, Granlund and Lukka, 1998y, Swan et al., 199, p. 909) The changing information needs of the management alter the requirements of the measures and reporting produced. Simultaneously, this changes the information gathered as the bases of accounting and of course the timeframes within which the information needs to be produced. The needs are often highlighted by outside consultants promoting their latest solutions. (Burns and Vaivio, 2001) According to Granlund (1994) a crisis can also result changes in the accounting function. Popular management fads and fashions suggested by Abrahamson (1991) and for example Malmi (1999) will be discussed more thoroughly later. Furthermore organizational structure, new accounting personnel or poor financial performance (at unit or company level), changes in statutory requirements and level of autonomy and the education and authority of the accounting personnel are also things worthwhile mentioning when looking for issues that could have an impact on the change process. (Innes and Mitchell, 1990)

Based on existing research there are institutional influences varying from actual government institutions to institutions established inside the accounting departments of companies and operators<sup>12</sup> who are aiming to become institutions in the digitalization market. (See Arjen tietoyhteiskunnan Neuvottelukunta, 2009) Even from an internal perspective accounting organizations contain many institutionalised, taken for granted rules and players. Accounting as a function is an old, compulsory and necessity based activity which has accordingly strong traditions. ((e.g. Hopper and Powell, 1985; Carmona et al., 1998) i.e. (Busco et al 2007 p.

<sup>12</sup> Operators are here referred to as institutions, because they have quite firmly established their position in the market and process of electronic invoicing. They have become taken for granted players in the market even though the process could very well be done totally without their existence.

130)) This side of institutionalised accounting can easily be forgotten. (Verstegen, 2006, p. 1138)

The established institutionalized players might have an important role also as messengers of the diffusion development. Bjørnenak (1997) had discovered that the source of the information about the innovation was also significant for the diffusion. He had divided the information sources into newspapers, courses, internal sources and others and then measured the differences in the total quantity of sources and whether the adopters and non-adopters (of ABC) had used different sources. In his research, courses and internal change agents were proven to be the most efficient sources in promoting diffusion when newspapers on the other hand were seen even harmful for progress. (Bjørnenak, 1997, p. 14-15) Swan et al had to come to the conclusion that promotion of the innovation coming from the direction of experts and specialists that are more impartial and clearly separable from the sellers of the software and systems is important for diffusion, because it is met with greater reliability on the part of the purchasing organizations. (Swan, 1999, p.921)

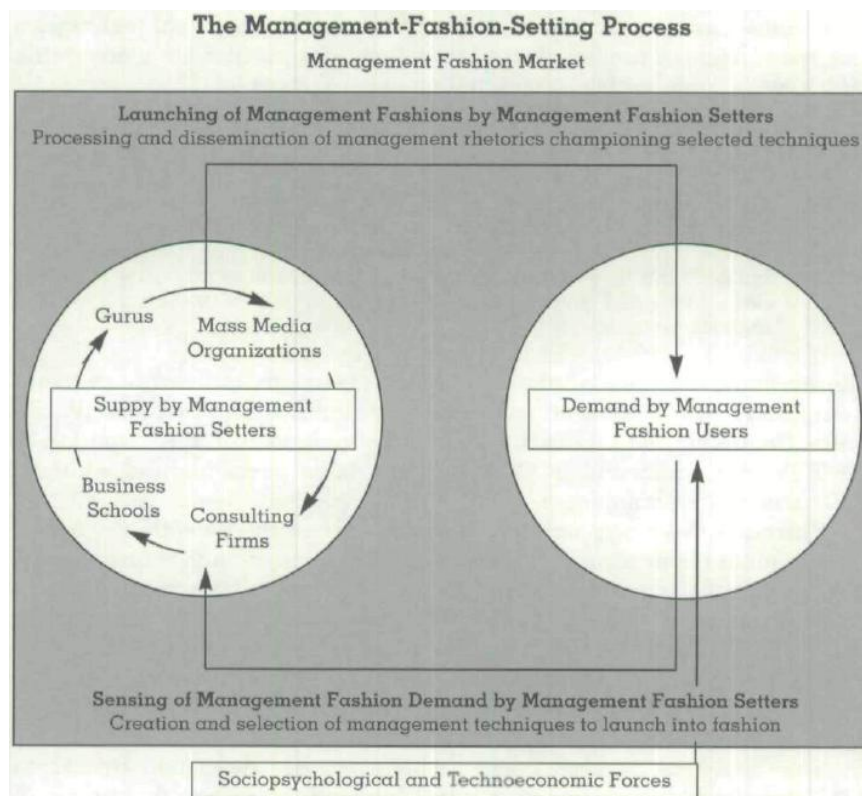
Busco et al. (2007) write that the change agent can just as well be an individual or a new IT system (for example Lukka, 2007) as well as an institutional factor like a political or economical pressure or a combination of them. (Busco et al., 2007, p. 125–149) This approach is also supported by Swan et al (1999) in their research on the diffusion of CAPM in Sweden and the UK. (Swan et al, 1999, p. 909) Lapsley and Wright (2004) have found that innovations are adapted first in the private sector and only afterwards in the public sector. (Lapsley and Wright, 2004, p. 372) They also state that the most important motivation for the adoption of a new accounting innovation in a government organization has been found to be a regulation or government pressure. (Lapsley and Wright, 2004, p. 359)

Diffusion is also explained with the dynamics and interaction of the actor-networks involved, so that the main explanatory factors are found in the success or failure of the types of messages that the actor-networks send out in order to further the diffusion. Thus in this view the pushing and pulling done by actors is emphasized instead of holding the innovation itself or the innovator responsible for the diffusion or rejection. (Alcouffe et al., 2008)

Most diffusion research is focused on the demand side of the diffusion process. In this thesis, the supply side is also taken into consideration. This is because it has potentially major effect

on the diffusion. The supply side includes all the promoters who are speaking for the innovation. In this case it means consultants, software producers even accounting academics and most importantly the early adopters who have the need for new adaptors so they would benefit more from the spreading of the innovation. (Bjørnenak, 1997, p. 8; see also Lucas and Rafferty, 2008, p. 157-158) The role of early adopters is emphasized, because they benefit from additional adopters and also have a dual role as they can be valuable experts for the future adopters. (Bjørnenak, 1997, p. 16, Malmi, 1999, p. 652)

The picture below shows the supply of management fashion setters, which is very similar to the supply side of innovations in the case of digitalization as well. The picture also shows that the supply of fashion setting is naturally dependent on the demand. This way Abrahamson notes that through a more educated demand, the supply can also be impacted. (Abrahamson, 1996)



Picture 7. The management-fashion-setting process. (Abrahamson, 1996, p. 265)

Imitation can significantly increase the diffusion of an innovation. It can create positive pressures for organizations to improve their processes or products to match or beat the



competition. On the other hand it can also support important phenomena like network effects in applying a good practice or creating an industry standard. (Lieberman and Asaba, 2006) According to Burns and Scapens the changes in accounting that would be consistent with the existing routines and institutions would be easier to make compared to those that do not fit into the existing framework and which thus challenge the familiar settings. (Burns and Scapens, 2000, p. 12)

For the efficient choice perspective the reasoning behind diffusion is found through performance gaps. These are differences between the goals of an organization and the goals that the organization can meet in its current state. Similar performance gaps are formed only for organizations with similar goals. Gaps can be formed in either a demand-pull or supply-push situation where the former results from changes in the environment which creates new gaps where as the latter results from new scientific or technological knowhow which either closes old or reveals new gaps to fill. (Abrahamson, 1991, p. 592-593)

In the fashion perspective, where the conditions are shaped by uncertainty concerning goals and the efficiency of technologies in respect of reaching goals, diffusion is explained through a process of imitation. It is suggested that in such times, the decision making in organizations is based more on imitation than on reasoning. This setting creates a vacuum for fashion setting organizations. Some of these organizations can be in the business of setting fashions, like consultants and some for their nature, like business schools. However these organizations are from outside the group thinking of adopting an innovation. This group also differs from the governments and labour unions in the way that they do not have the power to force anyone to adopt innovations, but they can choose from a wider set of innovations and have the means to inspire other organizations to follow their lead and trust the choices they have made. (Abrahamson, 1991, p. 596)

Fad perspective shares the features of imitation and uncertainty with the fashion perspective. The motivation for action is said to come from facts like retaining information that reduces the ambiguity concerning the innovation or the fear that the innovation might give a competitor competitive advantage. Here the meaning of the reputation of the first adopter organizations is discussed as is also the effect of bandwagon pressures as the number of adopting organizations increases. (Abrahamson, 1991, p. 597) Also as the adopting organizations are said to imitate the other adopting organizations, the non adopting

organizations have in the fad perspective no influence on the decision to adopt an innovation. (Malmi, 1999, p. 653)

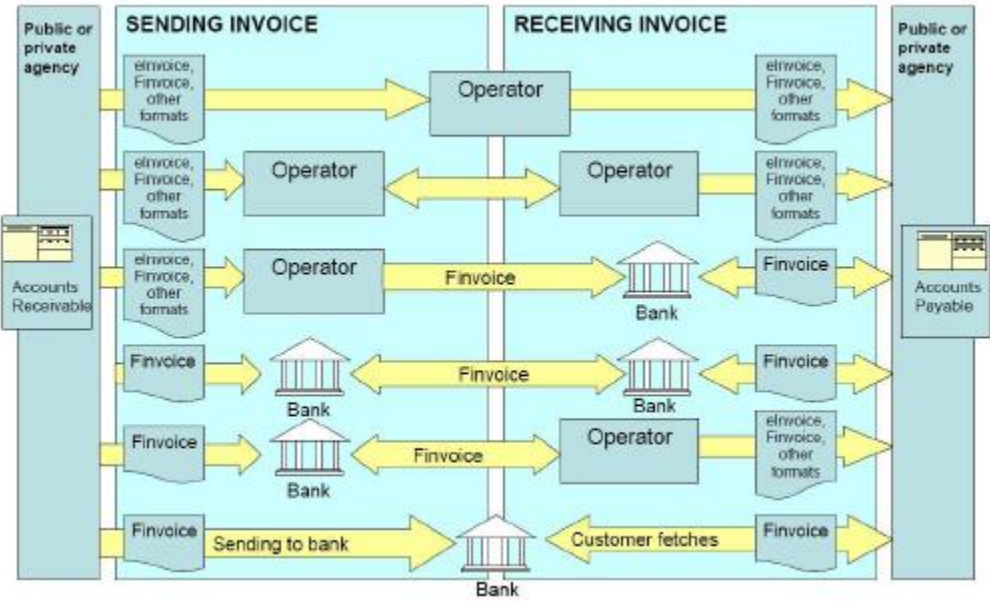
### 2.2.2 Hindering factors

Institutionalization can be seen as the enemy of change as it is said to bring stability and thus raise resistance to change. (Burns and Scapens, 2000) This can be illustrated for instance by the power that internal or external institutions have in a decision making process. In existing research actors such as internal accounting departments or competitors have been found as instances determining the diffusion of an innovation. (Lucas and Rafferty, 2008, p. 155) As digitalisation requires transition, based on academic literature, change resistance is likely to have some affect on the development. As in the MEGOC study by Busco et al. (2007) it is also possible in this case that the mixed information about the benefits and the obscurity concerning true motives for adoption is hindering the progress of the diffusion. In a large part of the previous research, the supply side of the diffusion is seen as a homogenous group with common interests. In the study by Swan et al. the motivations of the consultants and system sellers were found to be quite different. (Swan et al., 1999, p. 916)

The diffusion of an innovation can also be hampered due to competing solutions. Rejection even in the efficient choice category can occur, when an innovation is faced with a more efficient and competing technology and beaten by it. Another circumstance for rejection is when something changes the environment of operations and the change closes a gap that the innovation was made to fill rendering the innovation useless and bound for rejection. (Abrahamson, 1991, p. 593) In the case of forced selection, the motivation is said to come from an outside pressure. An organization outside the group that is so powerful that it can enforce the use of an inefficient technology for the other organization for its own benefit despite any resistance on behalf of the adopting organization. As examples of such powers governments and for example strong labour unions are suggested. (Abrahamson, 1991, p. 593) This way, also rejection can be caused by force. In the case of rejection the situation is often different in the way that there are forces speaking on both behalf and against the adoption. The party with the most power over the group concerning the issue wins and can thus cause rejection by force, whether it is beneficial to the rejecter or not. Of course there are

situations where the influential parties also agree on the rejection thus causing a swifter and more widespread rejection. (Abrahamson, 1991, p. 594)

Existing research shows that the problems in co-operation between operators are creating difficulties for both senders and receivers of e-invoices. (see for example Penttinen and Hyttiäinen, 2008) Although it seems that all adopters would benefit from a common standard, various versions tend to rise and complicate things. Ax and Bjørnenak use the term “interpretive viability” in the same circumstances when the selling side tries to artificially increase the size of the market. (Ax, Bjørnenak, 2005, p. 17) The picture below illustrates the different routes of communication of an electronic invoice from sender to receiver.



Picture 8. The paths of a digital invoice ([www.hse.fi](http://www.hse.fi), Penttinen, 2008)

In the fashion perspective the reasons behind the rejection of an innovation could be straight from a fashion magazine. Centralisation and decentralisation follow each other in cycles as shorter and longer skirts. Over time once innovative and new technologies grow old and boring and thus rejected as no longer fashionable. New fashionable technologies surface to replace and cause the rejection of old ones, a cycle that feeds many consultants. (Abrahamson, 1991, p. 596) In similar fashion logic, if a company wants to differentiate from others in its group, it might adopt an innovation. However when enough many others in its group imitate and adopt the same innovation, the one looking for differentiation is pushed to reject it. Likewise the reputation of the adopting companies can cause for others in the group to reject

the innovation. Also the bandwagon effect works in rejection so that if enough many organizations reject the innovation, a pressure for the rejection can also rise. The most extreme example could be the case where adopting a highly inefficient innovation can cause bankruptcy, which when coming to knowledge would naturally cause others in the group to reject the innovation. (Abrahamson, 1991, p. 599)

Even when an innovation is diffused, i.e. taken into use in a company, the further diffusion development can be slowed down by problems in the internal diffusion within the company. (Mansfield, 1963) In addition, implementing an innovation that is based on complex new technology requires both individual and organizational learning. It is not enough that a single person knows about innovation enough to use it. (Attewell, 1992, p. 6) The failure to build in the new procedures into existing ones can also be a major barrier for the adoption of the innovation. (Busco et al., 2007, p. 141) In the article Never mind the gap, Scapens discusses why in unstable circumstances, following rules and routines is often seen as a safe choice because it is easy to make sense of to others and to themselves, which further backs up the idea that change that fits in to the existing routines is easier to adopt. (Scapens, 1994, p. 310)

When looking at diffusion from through the eyes of actor-network theory even the innovator and stand taken towards the innovation can become a hindering factor for the diffusion. In the case of a management accounting innovation named GPM (George Perrin Method) the innovator felt that there was a need or a natural vacuum for his innovation, which therefore need not be promoted. (Alcouffe et al., 2008, p. 5) One barrier identified in previous studies, which has had an effect in the GPM case as well, is distance. This is the distance between the innovator or the promoter of the idea and the potential adopter. The distance is long when the idea presented is very abstract and the adopter is left alone to develop the idea into a concrete solution. This distance can thus naturally be shortened by for example guidance from inventor. (Lillrank, 1995)

Another distance problematic has been discussed by Bjørnenak (quoting Hägerstrand, 1967). There the adopters, referred to as agents, have around them an information field (IF) that describes spread of contacts that the agent has. In that model the distance affects the probability of contact, but is also seen as a barrier like differences in culture, language, income, class and tradition that is seen as an important factor in the case of accounting innovation. (Bjørnenak, 1997, p. 7)

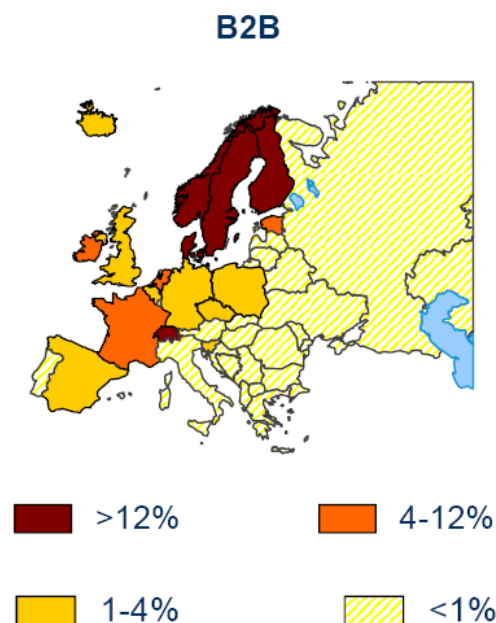
### 2.3 Research perspective

Existing research guides to look at the factors impacting the diffusion from the adopters' point of view. From this angle the factors impacting the diffusion of digital accounting can be divided into motivations for adoption and supporting and hindering factors which can finally determine the diffusion. The motivations of the demand side of the diffusion can be such as the perceived efficiency of the innovation, the elimination of routines or for example global harmonisation of processes whereas among other things the development of IT systems, invoicing standards and promotion efforts by consultants can become supporting factors. Correspondingly for instance factors such as resistance to change, interpretive viability and complexity of the innovation can build up to hinders for the diffusion.

### 3 THE RESEARCH METHOD AND METHODOLOGY

Finland is an ideal venue for this research right now. It is advanced in digitalizing accounting compared to almost all other countries (maybe excluding Denmark). (Bruno Koch, Billentis 2008) IT has brought electronic data interchange (EDI) and processing into the internal processes of companies and even between the largest companies already in the 1970's. (Tieke) Nowadays digitalization of accounting and for example electronic invoicing in Finland is a technology at reach of all companies big and small. Even when the information about the existence of these innovations is widespread, their diffusion in practice is still far from its peak.

According to Statistics Finland (2007) the number of companies capable of receiving electronic invoices has risen from little over 10% to fewer than 20% of all companies from the year 2005 to 2007. Respectively the number of companies sending electronic invoices has climbed in the same timeframe from approximately 9% to about 12%. (Statistics Finland, 2007) Based on a more recent research executed by Basware the rate of adoption of electronic invoicing has risen fast during the first half of 2009. During the first six months the number of new adopters exceeded 70% of the total number of senders and receivers in 2008. (Basware, 2009) On a wider context the picture shown below illustrates the situation of electronic invoicing between companies on a European level in 2008.



Picture 9. The market penetration of B2B electronic invoices in 2008. (Bruno Koch, Billentis 2008)

As Malmi (1999, p. 654) points out, based on his own research of the diffusion of ABC, Finland provides a good setting for this kind of a study for at least two reasons. “First, it is reasonably small in size (5 million inhabitants), yet the institutional context (e.g. legislation, universities, trade unions, mass media, professional bodies and stock-markets) is similar to that of most industrial nations. Finland can, therefore, be thought of as a microscopic version of some larger nation, its small size allowing a careful study of the diffusion process. Second, as a member of the European Union, Finland is a fairly wealthy, industrialized nation exposed to international competition.” (Malmi 1999, p. 654) Thus the results of this study could be useful in mapping the diffusion of digital invoicing, even on a European scale.

### **The research method**

The question form (see appendix 1) was sent to representatives in 11 companies with the request for a semi structured interview lasting approximately an hour. 4 of 11 companies gave permissions for interviews. One company contact had been established beforehand and another one afterwards in a conference. From these six companies a total of 11 interviews were made. All the interviews were recorded and transcribed to assist the analysis of the data after the collection phase.

From January to the end of August, the researcher participated in workshops and meetings for the FIA project to get a picture of the process from the supplier side organizations and the other facets who were actively aiming at developing and promoting the idea. It was not possible to record the meetings and workshops, so the researcher took notes and got the minutes of all meetings and memos from the workshops.

When processing the results of the interviews and evaluating the importance of the answers received, both the positions and the experience on digital accounting of the respondents were taken into consideration. If a factor or motivation or other factor was mentioned by all or almost all respondents, it was naturally considered important. However the fact that a motivation or a factor was mentioned only once or in a couple interviews did not mean that it could not be considered important in terms of diffusion. Also good justification for the importance of a factor was taken into account. These evaluation methods of the results were

chosen as the researcher saw that if the answers would have been evaluated solely based on the number of mentions they got in the interviews and meetings, important factors could have been left to too little attention. This view was also supported by the relatively small number of interviews and meeting observations, which could have any analysis solely based on the numbers of responses and mentions vulnerable. The researcher acknowledges that this method of evaluation does not contribute to the objectivity issues related to the researchers own views.

## **Methodology**

In order to create an understanding of the phenomena of diffusion in digital accounting, a case study method is necessary because it provides a much richer view of the case companies and their motivations both the internal and external ones. (Ahrens and Dent, 1998; Arnold, 2006, p. 13) It is also a study of an accounting process, for the study of which the case research method is recommended as the survey method is seen to produce more superficial results. (Scapens, 1990, p. 259) It also reveals a lot more of the logic with which the organizations operate thus enforcing the reasoning behind the factors influencing the diffusion. However as positive research it cannot predict behaviour, but it can only explain and describe based on the empirical data. (Scapens, 1990, p. 263)

The purpose of this research is “to draw on the theoretical framework to understand/explain specific behaviour—not to identify general covering laws” (Lucas and Rafferty, 2008, p. 152), i.e. not to produce statistical generalizations that would apply to a wide range of cases but to explain the phenomena at hand. Thus this thesis has an explanatory approach to the phenomena of diffusion of digital accounting. As interviews done for this research are few, they do not provide a basis for statistical generalizations. Nevertheless they do provide sufficient bases for finding the factors impacting digitalization in large Finnish companies. (see Ahrens and Dent, 1998, p. 9) This makes case study a suitable method as it has been said to be a means to connect theories to observations as explaining factors. (Lucas and Rafferty, 2008, p. 152 and 158)

The empirical part of this research consists of two different parts: interviews on the demand side (sending and receiving electronic invoices) and the supply side (including all the actors influencing for or against) the diffusion. This kind of approach was motivated by the criticism



which has been voiced out against the excess focus on the demand side of the diffusion process. (Malmi, 1999, p. 652; Ax and Bjørnenak, 2005, p. 2)

### 3.1 Reliability and validity

As Scapens (1990) points out, there is no such thing as an objective case study since: “The social reality must be interpreted by the researcher and, thus, case studies represent interpretations of the social reality”. (Scapens, 1990, p. 277 also quoted by Soim et al., 2002) To strengthen the results from the interviews in the case companies and to get a better view of the impacting factors, the researched attended several meetings and conferences organised by the supply side of the innovation.

To compensate for the lack of existing academic studies, the researcher gathered the results of several studies concerning the spreading of electronic invoices.<sup>13</sup> The survey based studies also give support to the result gotten from this qualitative study. (Arnold, 2006, p. 14) The chosen study method was applied to get a wider picture of the scene impacting the diffusion, which is important in positive research that wants to show how the world works and the ways in which different variables interact.<sup>14</sup> (Scapens, 1990, p. 260-261)

The data from this thesis is part of the interviews, based on the respondents’ statements. This is not case research in its “purest” form, because the researcher does not do field work i.e. observe the process, but has to rely on the statements given in the interviews. Thus there is a

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[http://akseli.tekes.fi/opencms/opencms/OhjelmaPortaali/ohjelmat/INTO/fi/Dokumenttiarkisto/Viestinta\\_ja\\_aktivointi/Seminaarit/RTEsummit/Bruno\\_Koch\\_Billentis.pdf](http://akseli.tekes.fi/opencms/opencms/OhjelmaPortaali/ohjelmat/INTO/fi/Dokumenttiarkisto/Viestinta_ja_aktivointi/Seminaarit/RTEsummit/Bruno_Koch_Billentis.pdf)

[http://www.basware.com/FI/Documents/Yhteyspalvelut/Kysely\\_raportti\\_verkkolaskutus.pdf](http://www.basware.com/FI/Documents/Yhteyspalvelut/Kysely_raportti_verkkolaskutus.pdf)

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[http://www.tieke.fi/mp/db/file\\_library/x/IMG/38707/file/HietamakiJohannaVerkkolaskupalvelut\\_2009.pdf](http://www.tieke.fi/mp/db/file_library/x/IMG/38707/file/HietamakiJohannaVerkkolaskupalvelut_2009.pdf)

<http://verkkolasku.tieke.fi/>

<sup>14</sup> This is important to differentiate from normative theories which try to find what ought to happen. (Scapens, 1990, p. 260-261)

greater risk that the interviewees might leave some of the information they have, out of the answers. This might happen for example because they want to give a positive image of the company they represent. This kind of sensorship would not be so likely to take place if the data would be based on observations of the researcher. On the other hand in the interviews the researcher can get information more efficiently and hear about situations where it would not be possible to be present in. In addition, the interviews made have been single interviews done on a certain day in each company, so the study is not a longitudinal one, which is needed in order to conduct a deep analysis of the change process. (Vaivio, 2001, p. 394) For the part of the FIA project, the circumstances have set observation as the method for gathering data. This has worked well for example as there has been only one case group the function of which to observe. (See Scapens, 1990, p. 264)

One important benefit of the interviews done in this study compared to the previous research on this subject is that in the interviews the researcher was able to use open questions. Opposed to giving a form with a readymade list of reasons, where the interviewees can choose from, here the researcher would have a minimal impact on the answers received. In this thesis it was also important that the case companies were large and represented different lines of business. It has been said that areas of business have been seen as having an effect on the adoption of innovations in accounting. (See for example Soin et al., 2002, p. 251) The size of the companies was important because when doing research on the functioning of an accounting process and the different parts of an organization the empirical results end up being quite flat if there are only a few people working in accounting. Similarly the companies interviewed all represented the same general category in size so that the results received from different interviews were comparable. For example the external factors impacting a company can be very different for a small and a large organization and the influence of each factor could also vary greatly. The interviewees also represented different positions in their organization so that the researcher could get a picture of the process from different angles within the organization.

### 3.2 Case companies and project organisations

#### **Case companies and their representatives**

Group A: European media group which is present in 20 countries and employs over 20 000 people was represented by their chief of invoicing.

Group B: A forest industry group that has facilities in 15 countries and employs about 25 000 people was represented by the e procurement manager.

Group C: A group providing power solutions has operations in 70 countries and employs about 20 000 people. A total of five people were interviewed: The development manager of global accounting, the manager of SSC global operations, the manager of SSC Finland, the development manager and the manager of accounts payable.

Group D: The group is in the lifting business. It is present in about 50 countries and employs about 35 000 people. Two interviews were made: The director of finance and the global finance controller.

Group E: The group is a supplier of technology and services for mainly pulp and paper, mining and construction. It has operations on over 50 countries and employs about 30 000 people. The company was represented by the controller of the SSC.

Group F: The group provides mainly IT and consulting services. It operates in almost 30 countries and employs about 16 000 people. Two interviews were made: The manager of global purchase to pay process and the project manager involved with electronic invoices.

#### **The FIA project organizations**

Aditro is one of the two project owners in FIA. It is a Nordic provider of IT-driven outsourcing solutions, business process consulting and IT-solutions for business process improvement. ([http://www.hse.fi/EN/research/t/p\\_7/RTE/fia/](http://www.hse.fi/EN/research/t/p_7/RTE/fia/))  
(<https://www.aditro.com/default.aspx?path=209372,209403>)

Digital Media Service Innovations – Finland (Dimes) ry is an association formed by companies operating in the field of information and communication and its purpose is to promote the commercialisation of Finnish technology knowhow. It is represented by Tuija Lompolojärvi who is the coordinator of the RTE-programme. The FIA project is a part of the RTE programme.

([http://www.hse.fi/EN/research/t/p\\_7/RTE/fia/](http://www.hse.fi/EN/research/t/p_7/RTE/fia/)) (<http://www.dimes.fi/fi/yhdistys>)

Hawcon Oy is an accountancy office that offers also outsourcing services and does consulting on development of financial administration. It is an SME whose CEO Vuokko Mäkinen has had an important role in developing the solutions of the project.

([http://www.hse.fi/EN/research/t/p\\_7/RTE/fia/](http://www.hse.fi/EN/research/t/p_7/RTE/fia/)) (<http://www.hawcon.fi/>)

Helsinki School of Economics (HSE) is responsible for the research done for the project. The school is the largest and leading business school in Finland.

([http://www.hse.fi/EN/research/t/p\\_7/RTE/fia/](http://www.hse.fi/EN/research/t/p_7/RTE/fia/)) (<http://www.hse.fi/EN/frontpage>)

The Association of Finnish accounting firms (Taloushallintoliitto) is an important affiliate as it represents the over 700 authorised accountancy offices in Finland. Their members operate in the financial administration of over 130 000 Finnish companies and associations.

(<http://www.taloushallintoliitto.fi/taloushallintoliitto/>)

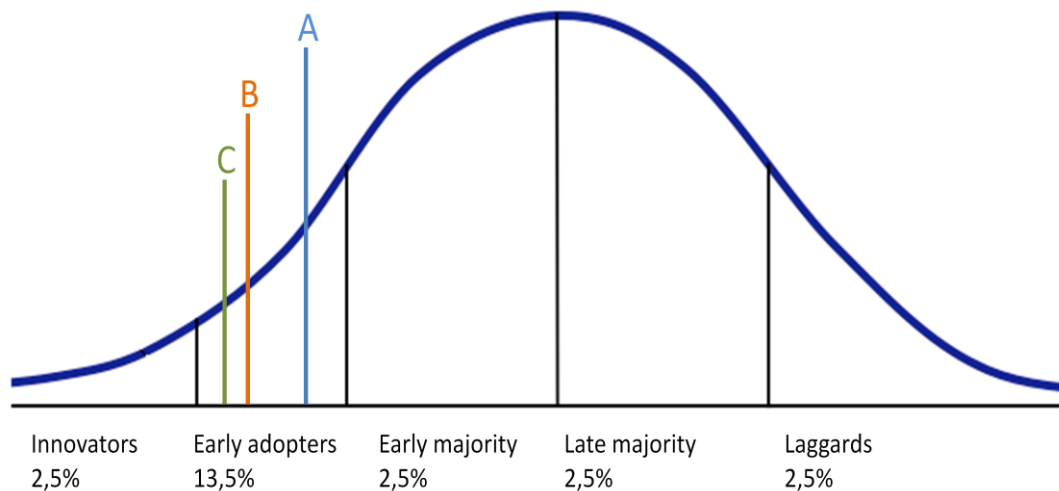
([http://www.hse.fi/EN/research/t/p\\_7/RTE/fia/](http://www.hse.fi/EN/research/t/p_7/RTE/fia/))

Tieto Oyj is an IT service company providing IT, R&D and consulting services. The group operates in almost 30 countries. It is the project owner together with Aditro.

([http://www.hse.fi/EN/research/t/p\\_7/RTE/fia/](http://www.hse.fi/EN/research/t/p_7/RTE/fia/)) (<http://www.tieto.com/default.asp?path=1,92>)

## 4 THE FACTORS IMPACTING THE DIFFUSION OF DIGITAL ACCOUNTING

Based on this classification and the information on the numbers of senders and receivers of e-invoices in the directory by Tieke<sup>15</sup> in relation to the number of companies operating in Finland, Picture 4 shows the current situation of the diffusion of innovation in electronic invoicing. There the line A describes the 9,1% percent of companies capable of receiving electronic invoices, line B represents the 6,7% percent of companies able to send electronic invoices and line C shows the 5,8% of companies that can both send and receive invoices.



Picture 10. An illustration of the current situation in the diffusion of e-invoicing in Finland.

<sup>15</sup> The numbers of senders and receivers are taken on the 7<sup>th</sup> of March 2010 from the e-invoice directory (Verkkolaskuosoiteisto) of Finnish companies sending and/or receiving e-invoices. <http://verkkolasku.tieke.fi/> It is possible that not all senders and receivers are listed, but as the list can be updated by operators and it shows the number of customers/operator it is highly likely that the number is very accurate and timely. This view is further supported by the fact that this site is the most comprehensive list of both senders and receivers available in Finland and it is commonly used as an address directory because the use is free of charge. The total number of companies in Finland is derived from Statistics Finland figures from 2008. This number is estimated to be quite close to the current number as the growth in the number of companies has been around 3% in the last two years. On 2008 the number of companies in Finland was about 320 thousand. ([http://www.stat.fi/tup/suoluk/suoluk\\_yritykset.html#aloittaneetjalopettaneet](http://www.stat.fi/tup/suoluk/suoluk_yritykset.html#aloittaneetjalopettaneet))

## 4.1 Motivations

Electronic and digital invoices have revolutionized the processing of invoices. This step enabled by the development of IT systems has changed and will continue to change the work of accounting personnel and the structures of the accounting organizations in companies. Large Finnish companies have moved from paper invoices to electronic invoices first through scanning and EDI systems mostly within the last 15 years. Scanning of paper invoices combined with the development of invoice processing systems have made it possible for organizations to centre all their invoice handling into large units. This is first of all because invoices can be entered into systems and thus the “the picture” can be viewed and the information content can be used anywhere in the organization globally. This has given organizations the liberty to place their invoice processing unit where ever they want to. In addition to the reasons related to efficient organisation for handling invoices, there were also motivations reaching outside the invoicing process. One respondent described how they will benefit from the electronic invoices and centred operations of the SSC so, that with the improved supplier data centred in one place they will be able to control their use of the agreements with suppliers done by the group. With the previous system it was difficult to see whether all the parts of the group used the contracts and got the agreed prices when the invoices went to different locations on paper. At the same time the digital invoice format has improved transparency also for in terms of auditing and internal control.

For the large case companies, the reasoning behind digitalization of accounting processes involves in all cases the search for efficiency. However in the case of this innovation, the potential for efficiency is different in all of the case companies. Each one of them is operating different system combinations with different settings. They are also gathering different amounts and types of data from the invoices. Some are teaching scanners to read information into the system from PDF files, one company has outsourced scanning and another is starting to send back paper invoices. Nevertheless, all the case companies shared the vision that digital accounting is worthwhile.

Group F, the manager of global purchase to pay process:

“Well there is the idea of automating the purchase to pay process as far as possible and this way manual procedures have to be gotten rid of. The Finnish market is so far developed that it pays off for all parties to use the digital channels here.”

However this reason does consist only of getting the work done more swiftly. Improved payment accuracy and quality of data from the invoices are very significant motivators. They are also achieved, when the information travels electronically between systems and the processes can be harmonised and thus for instance the number of human error can be reduced. This is an important point for the SMEs as well, because they are often the ones that have to wait the longest for their money. Thus the better payment accuracy has also been used by the case companies as a motivator for given to the SMEs to start electronic invoicing.

Even though the benefits of digitalization are clearly visible to the accounting experts and process managers in large companies, this is not the case for SMEs. When the numbers of invoices are smaller and the resources for monitoring the consequences of adapting the innovation are virtually nonexistent, it is impossible to conclude whether the innovation is actually bringing benefits or not. This is a clear motivation problem for the diffusion found in the project group when analysing the current solutions for SMEs. From the SME side the processes of sending and receiving electronic invoices can easily seem more difficult than sending and receiving invoices on paper (see Picture 8. The paths of a digital invoice ([www.hse.fi](http://www.hse.fi), Penttinen, 2008)). As over 90% of all SMEs fall into the category of a micro company (employs under 10 people, turnover and the value of the balance sheet each under 2m€) the organization of the financial administration often consists of the owner and his bookkeeper. It was often stated in the first project meetings that when the number of invoices is low, there is a lack of efficient solutions when using the electronic invoices would bring value added to the small company itself. This is where the accounting offices were seen as a possible future “shared service centre” for the SMEs to help create efficient solutions for them as well.

For the large companies digitalization has already enabled the taking of the next steps for efficiency and automation of invoice handling is at grasp. Some companies were talking about sending and receiving invoices straight, without operators, referring to a practice more common in Sweden or similar to the EDI solutions. Others were already talking about selfinvoicing which is a model where the buyer creates the invoices for himself and pays the supplier according to their agreement. This example, described by the process owner from the IT service company, concerned getting the posting information automatically for example

straight from the invoices or through accounts that are connected to the supplier in their own system.

Group F, the manager of global purchase to pay process:

“If we think about my part of the accounting process, we have a massive project on the way concerning the automation of invoice handling. We are aiming at automating the postings which should be realised throughout the organization within the next year.”

The answers of the respondents also showed how the content, accuracy and timeliness of invoice information were important far beyond the payment process and even the needs of statutory accounting purposes. Digitalisation and the following improvement in accounting information management were expected to bring benefits in forecasting as well as management of working capital.

Group D, the director of finance:

Another project we have going on, that has a strong link into digitalisation, is that we should be able to focus on the information that are in terms of our business is the most important both in the eyes of financial reporting and forecasting right.

Group F, the manager of global purchase to pay process:

“We have long time goals set for high automation ratios and efficiency in the process so we have no reason to support Xerox. Another thing is that we can shorten the time taken in the invoice handling process, because if the supplier sends his invoice on paper it take days for it to be in our system ready to accepted whereas if it would come there right away in electronic form.”

On the other hand another case company was looking forward to getting more information from their invoices. This was because with the start of electronic invoices, they had the possibility to automatically read more than just the payment and customer information from the incoming invoice files. There were also a lot of expectations on matching invoices to orders and payments.

Group B, the e procurement manager:

“We are looking forward to automating invoice processing and getting more data from the invoices, matching up the invoices more easily and doing the process more cheaply. In the future this will save a lot of work, but I’m not sure if that is something that is said out loud.”



Correspondingly more than one interviewee specifically stated that in their digitalization process special attention has been put to keeping things as simple as possible. One interviewee emphasized that as their business has to be more agile these days, the same dynamics are required from the administration as well. Without simplifying and harmonising the processes in accounting they could not respond to change as fast as they would like to. Here are some answers that illustrate the difference in the goals described by people in different organizations and on different levels of the organization:

Group E, the controller of the SSC:

Uniforming the operations and finding the best practices and benchmarking to find the best operations for the service centres to use.

Group D, the director of finance:

“Then there is the concept of flexibility. Now that the systems enable it, it is so easy to say that you have to be flexible and in all directions; it should not be so. You should be able to define in the most standard way, what are the fundamentals and ensure that they are right.”

“The system is a tool, but it has to be used right so that it serves the business.”

Group C, the development manager of global accounting:

“When we automate things it’s reducing someone’s work and this is why we have to plan very carefully the entire setup, but the benefits are mostly in quality. We do all things in a similar manner, there are no surprises and this is for me much more important than whether there are one or two people less. It does not matter at this level as much as quality and agility of the organization.”

In general there were a lot of expectations for the spreading of digitalization outside the borders of Finland and with it the unification of processes throughout entire groups. As this comment shows, there are many issues connected to the SSC model and centring operations that the digital invoice processing is making possible. It also alludes to the situation where international progress has been hindered by the state of development between countries as the majority of countries are lagging behind Finland in the use of electronic invoices between companies.

Group C, the manager of SSC Finland:

“The next thing I’m looking forward to is that this will be taken to Europe because we have many suppliers who deliver to many on our units on a European level and this digitalization along with the concentration bring along transparency and for example the possibility to synchronize our agreements and practices.”

The most important motive for digital accounting is the efficiency benefits of the solution. The benefits include basic cost efficiency as an invoicing and invoice processing, but even more importantly in information management. Through digitalisation the information gathered from invoices is seen to be more correct, available faster, retrieved more efficiently with the help of automation thus also created cost savings and finally the information content can be controlled better. This reason was given by all interviewees and it was also a highlighted by solution providers in addition it has been the motivation with which digitalisation has been promoted also internationally.

Other important factors are harmonisation and transparency. Harmonisation in this case means unifying done in the process of sending and receiving invoices both within and between companies. Benefits could be gotten from using the same systems and methods within a company but also by applying the same standards in the communication between companies. The importance of this motivation is based on good reasoning given by an interviewee describing the benefits of being able to remove tens of different systems and replacing the systems and different variations of invoices procedures with one common method to be used throughout the group. In terms of communication between companies the vast efforts of reaching a common standard and the Finnish efforts communicating this important goal both nationally and internationally provide good reason to highlight the motivation. Furthermore, the problems related to the lack of standardising have spoken well for the importance further development in this issue.

Transparency is also a motivation that has both an internal and external facet. Based on the interviews, digitalisation creates significant benefits in terms of internal control through for example good and timely access to information and logs created from accepting and processing invoices. One interviewee also stated an enlightening comment on managing the purchases and contracts of the group and how great benefits can be achieved once this information is centred and accessed from both Finnish and international parts of the group. The external part of the benefits of transparency is important as digitally stored and

intermediated trade can be much more easily audited by authorities and it is much harder to falsify. This is important because it helps get the support of authorities and the state which can for their part have a significant impact on the progress of diffusion. This is because the state is a large buyer but also because it can use coercive power to enforce a practice (as it did in digital invoicing in for example Denmark).

The most important motivations are however not issues that are seen to benefit the smaller companies at least up to the extent as the larger ones. This creates the biggest motivation problem in terms of diffusion. For the smaller companies, at least for now, the invoicing process has not become simpler, but in many cases more complex instead. This is for instance due the lack of standards and simple solutions for the purposes of the smaller companies and also to the variety of requirements set by larger companies for invoicing. This problem was mentioned generally by most respondents by stating that the SMEs are a problem, because they are resisting the spreading of this innovation. On the other hand the SME issue was discussed in all of the meetings of the supply side attended by the researcher.

#### 4.2 Supporting and hindering factors

One of the biggest concerns seems to be the varying invoice formats that are developing on national levels in the absence of at least a common European standard. Within the European Union the level of e invoice adoption in the number of invoices varies now between less than 3% and over 30% in electronic form. (Final report, European Expert group on e-invoicing, p. 15) This situation reflected on the responses of the interviewees.

Group C, the manager of accounts payable:

“I would say that the process has been hindered by problems in co-operation and compromising when the operators are driving their own interests in European countries. The systems and infrastructure exist and the technology is working so it is down to co-operation and whether there is will to do it or not. In Finland we have reached a consensus of a certain level but we don't have that in Europe yet.”

Another concern regarding European development is the growing number of PDF invoicing. This is a problem because these solutions are not authentic digitalisation and do not support efficient use of information. According to the observations and conference participation, also

the number of service providers offering PDF invoicing as a digital solution is growing. It appears also on the selection of Finnish service providers.

In addition as the number of solutions and operators has risen, so have the applications of standards. Even the standard formats contain huge amounts of information and for it to travel correctly from the sender to the receiving system the configurations must be synchronised. This is challenging between different systems and especially if the invoice needs to be converted into another format in the process. The interconnected nature of digital invoicing is seen as a hindering factor for the development. This emphasises the need for the Finnish e-invoice standards. Most interviewees felt that it was good that we had these choices and they were developed. There were also high hopes for a European standard to form. For the part of the solution providers also the possibility to test the invoice types was seen as beneficial for the development.

The suitability of an innovation to the environment where it is supposed to diffuse is an important factor impacting the success of the diffusion. Therefore the respondents were asked if they felt that digitalizing invoicing suited well the development of their processes in general. For the large companies, scanning was already standard procedure, because the invoices were needed in electronic form. However several interviewees stated that scanning is quite expensive and this is highlighted when comparing it to electronic invoices. After these comments, it was obvious that the digitalization development did not seem to be a big step after scanned invoices in the internal invoice processing. Some respondents said that as they have a house full of engineers and people who are used to operating in IT systems they are more than happy to see their invoices through their computer. On the other hand it was said that this is an easy development to sell in Finland but that it would be a totally different story in their foreign units. There the circumstances were not ideal as in Finland due to practices such as the digital signature and legislation related to accounting.

For the part of large companies, EDI solutions were one important factor in digitalization of accounting. Yet they brought up mixed feelings among interviewees. Some felt that the solutions had slowed down the spreading of e invoicing on the sales invoices side. As the EDI solution filled the need of digital and automated information transfer between companies, it left no room for a new solution like e invoice with a bit different characteristics and opportunities, described some of the respondents.

Group B, the e procurement manager:

“For the part of invoicing the use of EDI has slowed down e invoicing, because some feel that a process model containing an operator could not work there.”

On the other hand some interviewees expressed that it had been beneficial for the spreading of e invoices that the EDI solutions had been here for some time. Thus they had already paved the way for the mass solution by showing the benefits of digital invoicing. This was supported by comment of an interviewee who was asked whether EDI had enhanced the spreading of e-invoices or rather been in the way of the development. Electronic invoices were seen as a scalable way for digital invoicing compared to EDI solutions.

Group C, the manager of accounts payable:

”The EDI solutions have speeded up the use of electronic invoices, because with EDI we are talking about big masses of invoices and a significant investment so the suppliers are carefully picked whereas electronic invoicing you can start with anyone.”

It was clear that those companies whose purchases were more centred had had more of EDI solutions and they had also acquired them earlier compared to the companies with more dispersed sales or purchases. Also the frequent use of orders and order confirmations increased the amount of EDI interfaces in use.

Group C, the manager of SSC global operations:

“When you get big volumes of invoices from a small group of suppliers, then of course the interest grows when you see the benefits much sooner than in a situation where there are more suppliers.”

Getting sufficient volumes behind the innovation also among the SMEs was highlighted as an important factor in both the interviews and observations. This was a common goal for both the supply and demand side of the innovation because the benefits were seen to grow as the share of digital invoices from all invoices grew. Thus SMEs who of over 300 000 companies in Finland SMEs represent over 99% were needed in order to realise the efficiency potential of the innovation. Nevertheless, among these companies the diffusion was very much in the beginning, which was seen as poor progress considering the importance of the issue. This is why an increasing amount of effort was put into speeding the development up in the future by both the demand and supply side of the innovation.

The buyer side of digitalization had already formed a group and were working together, so it was a natural time for the seller side to start co-operating as well. To speed the development the FIA project was launched between Tieto and Aditro groups representing operators and solution providers for both large and SME size companies. This was an important sign of change both in the attitudes and operations of the seller side organizations. It has already had a significant impact on involvement of supporting organizations, finding common solutions and on the communication of a more synchronized message.

As the digitalisation development in large companies has been underway for a relatively long time, most of the interviewees had not been in their positions when the first efforts to digitalize accounting processes like scanning had been begun. The first efforts seem to date around 10 to 15 years back. The general impression of the interviewees is that back then the decision to start the development has come from high up in the organization. The start has been connected to either establishing service centres or an implementation of a new system or even both. Accounting department has been in most companies active in the beginning, but later on the responsibility concerning digitalization of either invoicing or incoming invoices has in some cases been moved to for example sourcing and in the case of processing incoming invoices it has in all cases been focused to a service centre.

Group C, the manager of SSC global operations:

”The first e-invoice has gone through our system about ten years ago.” The development has been slow. I remember the times when the e-invoices were starting up and there was a lot of talk about how the technology would spread fast and wide. But in the beginning one had to work hard to get the suppliers to send invoices in electronic format but then we made a larger effort concerning the senders and one of our employees in the SSC was in that project. We sent letters and contacted them and in the beginning it took some time from us too, practicing what the different codes were and how they functioned in different situations.”

Between companies, in Finland digitalization of accounting has been a joint effort in many ways right from the start. Benchmarking and co-operation are mentioned frequently among the interviewees. This is natural as most of the case companies are members of a group called Finnish e-invoice Collaboration Network (FeCN) which has been established in the end of year 2007. Meetings are held regularly on at least two different organizational levels. The idea

of digitalization has first been discussed at the higher level and then, when moving to the implementation phase a subgroup has been formed to deal with and discuss the future and practicalities regarding digitalization. As the manager of group C stated, the group was formed as an answer to a clear need of a co-operation forum.

Group C, the manager of SSC global operations:

“The scarcity of networks where invoice senders and receivers could connect was also a problem in the beginning.”

Group C, the manager of accounts payable:

“There was a meeting of top managers in accounting and finance and one of our managers participated and there they discussed electronic invoices etc and then we started to think about the issue and our position in it internally and that’s how a group called FeCN was formed among a group of ten large Finnish companies. In that group the companies discussed the problems and ideas they had and discovered quickly that they shared the same problems.”

Some of the companies feel that the influence of other companies in their internal development has been rather small. The main channel has recently been the meetings between SSC representatives and their visits to for example other service centres.

Group C, the manager of SSC Finland:

”On benchmarking.. In a way we imitate, but we take only the features we need. Site visits are organised once every three months. Now I have called them over here because our service centre is the most international one. There are unnecessary fears concerning managing the service centres functions for the Asian or American parts of the group, but we have been taking care of them here and it is a delusion that they would be any more difficult than the others. For example language skills are a thing the people usually wonder that how do we have such a wide range of language skills within our personnel. Other things that we have been asked about are legislation and time zones that are we here around the clock.”

However, it is clear that these large companies also benefit from each other’s progress as they are “in the same boat” as drivers of the national progress. Nowadays also the number and level of service providers on e-invoicing have risen, which is also impacting the diffusion. For example when spreading the word among SMEs, it is much more efficient when the same message is coming from several instances instead of one. Similarly, when one large company

gets an SME to send electronic invoices, all the companies receiving electronic invoices most likely benefit as the SME applies the same invoicing method to all his customers. (Naturally the same rule has applied when a large company managed to get any other large company to adapt digital accounting.)

In this context, it was interesting to see that even when the necessary motivators existed, the contacting of new invoice senders and receivers was according to most respondent's opinions very labour intensive. Even though the sending of letters asking for e-invoices worked to promote the diffusion, they were never enough for the case companies. Every one of them had at least one person, who their suppliers could contact to ask for advice on the invoicing practices. The respondent who had already set a deadline for returning paper invoices estimated that it would take some effort before all incoming invoices would be in electronic form.

Concerns were also voiced out relating the impact of forcing done by large companies. There were some insecurities related to the reactions of the suppliers in a situation where it is necessary to get suppliers to send the invoices electronically even through pressuring.

Group B, the e procurement manager:

"For the people handling invoices the electronic invoices don't differ compared to the scanned ones. A whole different matter is how our suppliers take the fact that they are forced."

Similar problematic is of course faced in sending e-invoices as well. When the party sending an invoice wants to move to sending digital invoices, the forcing is most commonly executed by adding an extra charge for the paper invoice. In one of the meetings of the supply side a representative of a large company sending invoices to consumers spoke convincingly about how the customers have not disappeared although they have put a price tag on a paper invoice. They had also reached good results in getting people to change to electronic invoices.

When some of the external issues have been solved and the invoices have actually started to arrive electronically between companies, they have faced a different kind of a problem. The people working in the accounting departments of the case companies have expressed variable resistance to the changes in the digitalization process. One interviewee mentioned in an



informal discussion an example where a couple of their employees working with invoices had agreed upon an approximate quota of invoices that they would handle per day so that the efficiency would not render them without a job or doing some other work as well.

As the effects of digitalization have increased efficiency throughout the accounting process, some of the bookkeepers have had to learn new working methods. Some have for example moved to tasks that have previously been more connected with controlling than traditional bookkeeping.

Group C, the development manager of global accounting:

“When you are a bookkeeper, you might think that the bookkeeping is the only thing you can do and sometimes it might even be and now you are feeling that it is taken away from you and there is this resistance for change when the responsibilities are reallocated, but it is something we just have to understand and it’s humane.”

The changes required for the development affected both the roles and the systems in SSCs. Many of the companies have either had big ERP implementations, updates or rollouts within their group quite recently. All of these companies have seen those projects as highly important and influential in terms of their accounting processes. However the interviewees did not see the development of the systems as defining factor in the future of their accounting processes.

Group C, the manager of SSC Finland:

“When we implemented System X in July 2004, naturally while making the configurations we aimed at developing these accounting issues. It was one process among others, but if we now think about this system, it is the input that comes from the people responsible for the process that determines the development of the software.”

On the other hand the common lack of knowhow on electronic invoicing among foreign suppliers has caused a lot of time consuming situations. Some of the problems are in the communication between systems, some in the communication between people. Some respondents felt that the problems were increased by the involvement of the operators but in some cases the existence of operators was seen as a good thing as long as they are the ones building the connections so that the invoices travel smoothly. Based on the comments of the respondents with international experience, the co-operation between operators internationally

is not working efficiently. The respondents felt that the sender and receiver of the invoice were themselves much more active in trying to solve why the invoices did not go through than the operators whose job it is to intermediate invoices between the two companies. It has to be mentioned that the respondents felt that some of the European and American operators and their policies were more to blame than their Finnish colleagues. One project manager gave advice on going international in receiving electronic invoices.

Group F, project manager involved with electronic invoices:

“Finland is Finland but abroad the careful picking of suppliers is essential. Are they already using electronic invoicing, have they been using it continuously, do they apply a given standard, are they committed, and these projects always stretch because these issues are not critical in terms of business and there are so many parties involved and it is not just about a single supplier. It is just good to acknowledge that even a simple implementation can end up taking months.”

The problems on the international scale have made the problems in Finland look small in the eyes of the respondents. One SSC manager commented that the expectations on the spreading of electronic invoicing were wild in the beginning. Now people are surer of the benefits and at the same time of the fact that it is going to take time for the innovation to spread both among SMEs and internationally.

This view was generated from the common knowledge among large companies that SMEs are rarely capable of being advanced in electronic invoicing. In addition they are mostly asked to send their invoices electronically which even most of the large companies do not yet do. Often the SMEs may not even know what an electronic invoice is let alone how they could send one. There are also problems like the lack of knowledge on the possible benefits, resources and capital that most often stop the smaller companies from digitalizing their invoicing. This has resulted in a situation where the big companies send letters to the smaller companies first asking and then in some cases forcing them to send their invoices in electronic form. Some have even established portals which the small companies have to use if they can't deliver their invoices electronically any other way. Operators have also started to activate in helping solve this problem like the following comment shows.

Group D, the global finance controller:

“We have done a project with software provider X to activate our suppliers.” “In practice they have contacted our suppliers; the ones that they knew could send electronic invoices.”

It appears that some operators have also started to build up their own databases containing information about companies sending and receiving electronic invoices. They use these databases to help their customers widen their network of invoice receivers and senders in their systems. Of course for now, this helps mostly the larger companies, who can afford the service.

By the supply side of the diffusion, developing solutions for SMEs was seen as a highly important action in the promotion of the diffusion. For most SMEs the bookkeeping has been the same for decades. Income statements and balance sheets have been drafted year after year mainly for the authorities, because the reports are statutory. The project team talked a lot about what this meant and how this attitude and practice could be changed with the help of digitalization and the new solutions.

Another significant problem to tackle in e-invoicing has been according to the interviewees' right from the beginning up until this day the mixed pricing and agreement policies and standards of the operators. According to the Tieke website, there are altogether 15 operators 6 of which are banks. (On a European scale, there are approximately 400 service providers.) The services by the banks were somewhat comparable on paper as the pricing models were similar and all banks offered services that used only the Finvoice standard invoice. (See appendices 2 and 3) Oppositely the prices of the operators are even according to a recent research very difficult to compare. Especially when you take into consideration the fact that the operators use different invoice standards and the pricing might vary if the invoices need to be converted from one format to another. When sending sales invoices, in all the models the sender would also need to take into account what it costs if he sends an invoice to the operator and the operator has to send it to the customer on paper, because the customer cannot receive electronic invoices. And these are just the pricings; the agreements are a whole different matter. Almost all respondents emphasized that a common standard in invoicing would have benefitted both the senders and receivers of invoices.

Group C, the manager of SSC global operations:

”One slowing factor according was the mixed pricing policies of operators and banks and all others. There was room for improvement. ..The problems in pricing and comparing the operators are still there at least to some extent.”

These issues have risen a lot of talk among the demand side of the diffusion. An extreme comment also showed how the institutionalised position of the operators was not obvious to begin with but is a result of the developments. A project manager who was involved international e invoice projects reflected on the necessity of operators.

Group F, project manager involved with electronic invoices:

“There are structural issues that can... for example some companies send and receive electronic invoices without an operator. This is not so common in Finland but is done more in for example Sweden so that now our supplier is sending electronic invoices straight from their system to our operator, but we could do it so that they would send it straight to our system and this would mean a whole lot less of testing compared to when our operator is involved. This is a model that could be done but of course we want to use our experts and there are a lot more positive issues even though the testing is a harder. They have the technical resources to make the necessary changes and do the testing and in the other scenario the accounting people should know about the technology themselves and it is demanding.”

However it is good to remember that the operators would not be in this business without markets. The Finvoice format has fulfilled the legal requirements for an invoice in Finland for a long time. It also contains a long list of information fields that one can use for multiple purposes. Yet many companies choose to pay extra to get their invoices some more information or in some case just a nicer image because the Finvoice can contain only text or numbers and is entirely black and white. (It cannot for example contain a logo of the company.) A representative of a European media group involved with their sales invoicing reminded where the roots of the different invoice formats lie.

Group A, the chief of invoicing:

What caused a little bit of extra trouble in the beginning of invoicing was that the basic Finvoice standard was not enough for us. We have so much more information that prints out from the order that we had to tailor the free text fields.

On hindsight, from the viewpoint of the case companies, most of the benefits of digital accounting could have been achieved with only one invoice format even if it was the basic Finvoice. The ability to reach an agreement on one common format and sticking to this format would have saved a lot of time and money from the case companies. This is clearly reflected on the comment of a SSC manager of the power solution provider.

Group C, the manager of SSC global operations:

“For starters, life would have been much simpler if there would have been a clear standard first of all on the scale of Finland but then also on a European level. It should be simply agreed that this is an e-invoice and then you would not have to make the same mistakes with every supplier.”

As suppliers in the diffusion process, the banks too are getting some negative feedback. Some interviewees state that they have been too slow in developing their systems. Others have trouble with the banks pricing and even on getting the invoices to go through the banks system. In the workshops the banks have been criticised for their difficult contract procedures and poor co-operation in easing the use of electronic invoices. Later on in the project the banks have committed to easing the starting of both electronic invoicing and receiving electronic invoices.

Group F, project manager involved with electronic invoices:

“Of course the banks could have been much more active in this process. They could for example campaign for the project. Now the entrepreneurs are paying the post to deliver the letters, so one could imagine that the banks could use that turnover.”

On the supply side, it has to be taken into consideration that as the number of operators rises, this might also create mixed of confusing messaging for companies that have not yet adapted the innovation. This has also been a motivation for the bandwagoning efforts made by groups like the FeCN, FIA and Tieke who bring together parties representing all parts of the digital accounting process. They have published articles, funded research, held conferences and given presentations to spread information on electronic invoicing and its benefits. In addition there are tools and info packages built in on the Tieke website.

On a larger forum the EU Expert Group on e-Invoicing chaired by Bo Harald (the head of the Executive Advisors unit in Tieto) has published its final report on November 2009. The report

includes recommendations on how to proceed with e-invoicing on a European level. This European effort is supported by encouraging examples like Denmark, where the state has been an active player in pushing ahead the digitalization development. In Finland the actions of the state are raising a bit mixed feedback. One interviewee mentioned state representatives as a good example whereas two others are ready to give the state and its interfaces twigs rather than roses. The large companies have been far ahead of the state in this process even though the state alone has even bigger invoice volumes and should have the same possibilities for benefits as the large companies do. They also have a lot more power in bringing to practice new standards.

Group F, the manager of global purchase to pay process:

“I think that the state could have done more. For example we get a lot of invoices from authorities and we have not been able to get them on electronic form. ..This is just to say that the talk and the practice could meet a lot better on the public sector.”

Group F, project manager involved with electronic invoices:

“I think it is important that big operators like the state and large companies have put on deadlines for the transfer and the municipalities are also one that we should get going in the group.”

For the SME sector the importance of external influences is highlighted as in most cases they lack their own will for adapting electronic invoicing. This is why the reason for an SME to start electronic invoicing is often the fact that they are forced by one of their large customers. Based on personal experience the researcher can state that there are also many SME entrepreneurs who are so firmly set in their ways on using paper invoices that they state loud and clear that they will never start to use these digital systems. These people are creating a bandwagon effect against the diffusion. This is a big challenge, because the SMEs are in terms of the number of companies a huge group to reach compared to the large companies. In the observed meetings, it was often said that in these cases the B2B side should benefit also from advances in consumer e-invoicing which should be spread at the same time to familiarise people with the practices. All connection points were to be utilised in the SME sector. Thus the approximately little under thousand accounting companies in Finland were also seen as a good route, an influence to reach the masses of SMEs. In addition the SMEs do not have a network of their own to share on the benefits, problems and solutions related to electronic invoicing.

Based on the interviews in the large companies, the diffusion of digital accounting and electronic invoicing has started from meetings among colleagues in different companies as well as with internal resources. Some of the case companies emphasized the fact that the thought had come from within the organization where others clearly stated that also consultants had had their part in the development. Where consultants had been involved, they have been used in several ways from aids in research to aids the rise of new models. In some cases the information coming from a software supplier has also been significant in speeding the progress.

Group C, the manager of SSC global operations:

I remember when we were implementing the first system for purchase invoices that the sales organization of Software X was then fairly active and they got us into this quite quickly when we had been to one of these demos. That was how it started for us for that part and then when we had this big ERP project.

Digital accounting lies heavily on the functioning of IT systems. Therefore the respondents were asked about the role of IT departments in developing the systems and processes. As mentioned earlier all the respondents who had been managing e-invoice projects knew the technology and software used in their group quite well. Some representatives of the case companies clearly stated that it was an absolute necessity for them to know the systems well in order to manage the development. In all cases the role of the IT department was seen as an important one, but there were also signs of the decline of their power in accounting issues.

In all of the case companies, the existence of a service centre was a taken for granted issue. Within the last few years most of the case companies had centred parts of their accounting process into one or more SSCs within Finland or internationally. In spite the fact that outsourcing has been talked about a lot in connection to establishing SSCs and especially in taking the business of the SSC outside Finland, none of the case companies had outsourced their SSC. Some have moved or at some point had the basic processing of invoices in centres based outside Finland, but not outside the group. Only one company has outsourced scanning. The invoice processing phase was one that the case companies wanted to keep within their own group. The companies also felt that it was important to keep in mind the problems so that

they would be solved instead of pushing them outside the operations of the group. Insourcing was clearly the solution for the large companies.

The global purchase to pay process in an IT service company described the role of their IT department in digitalization as well as the relationship between the IT and the process owners.

Group F, the manager of global purchase to pay process:

“We have an IT department but in terms of our ERP it is responsible only for the functioning of the system and the servers and such. They really do not have any say on the development of the system. It is all the time our responsibility and in our control. We just kind of buy or use their services. We are expected to have the knowhow of the system so that we know what we need them to do for us and they do not do anything unless we ask for it. There are no free lunches here.”

The role of IT in digitalizing accounting was clearly seen as a role of a servant and an enabler. IT was involved in everything, but was not really defining anything. Many of the development projects described by the respondents were called IT projects and some had project managers from the IT department. The important issue was that the content and changes to the system were clearly not defined by the IT people who knew most about how the technology worked. The respondents emphasized that the people running the SSCs have to know a lot about the information systems, because they need to know what they can require from the system. This way they can communicate their needs to the IT departments specifically and thus get what they want.

Group B, the e procurement manager:

“Nowadays there are so many IT development projects that there really is neither time nor necessity to start any other ones. In the current digitalization project IT wanted to give their approval, but did not interfere in any other way.”

All the invoice handling processes of the case companies were, however, similar in the way that they all involved scanning of the invoices. As mentioned earlier, this part of the process was only outsourced by one respondent but present in all models. Because the scanning is very expensive compared to receiving e-invoices, it could also be seen as a motivator for the diffusion. On the other hand the fact that scanning is known to be expensive is driving companies away from digital accounting, because they know that for the time being it also requires scanning of paper invoices.



There is currently especially strong support for user friendly interfaces into invoice processing systems. Several companies mention that there is room for great improvement and one company stated that this will result in a big change from one system to another. This is understandable as the change resistance could rise significantly due to a poor system even if the issue itself would get a positive response. In general the impression was that people in the accounting departments were used to the fact that the systems they used were normally made with something other than user friendliness in mind but in one case where the process touched the organization more widely the issue rose to even greater importance.

Group D, the global finance controller:

Well we have our own way of handling purchase invoices in the way that we do not have a centred place where the postings are made. All the accounts are put in the system all around the organization so naturally the system in which this is done affects the users widely. I remember the first time we started with the System X... It was a system for which we got a lot of thankful feedback that for once there was a system that was simple enough and worked. With the current System Y we have had a lot more problems because it operates with a bit different principles. Through the systems come organization wide impacts.

As all the organizations had been divided in either functions or processes, issues such as digital accounting and invoicing that involved several processes required representation from the different groups in the development teams. Then there were of course the different geographical areas and areas of business. IT was always included as was the SSC. Then there were for example people from sales or purchases depending on which invoices were discussed and in most cases accounting department was represented as well. Along the last ten years according to the respondents it was the accounting and IT that had become smaller players in the digitalization as the SSC had taken a bigger role. An SSC manager of a power solution provider described their situation as follows:

Group C, the manager of SSC global operations:

IT is involved but it is a fairly small player in it in the end. Of course they know what is possible in the system but first of all we need to have a representative of each business and then should we think about our geographical division and should we have representation of all the big companies or some of the special smaller ones, are their differences between Asia, Europe and America then the time zones and then see it by the functions so that there are people from the finance and from the operations.. all these are from into a project team, reference group and a steering group that makes the final decisions.

In several interviews comments were made about the difficulties when dealing with internal institutions like the accounting departments in a change process. In one of the interviews however the respondent emphasized the positive sides of having a certain amount of stability in the operations. The project manager of the IT service company pointed out that it is not the business of the group but the constantly changing nature of its operations that has created challenges in the past and even in the e-invoicing project.

Group F, project manager involved with electronic invoices:

“This organization keeps changing all the time. .. The operations of the group have been quite dispersed in terms of the whole group, even last year we still had x different business areas, which did things more independently. Now these parts have been pulled together.”

The case companies were large so the diversity of areas of businesses caused some arrangements and variety in the IT systems used. The large ERP systems or their parts (mainly invoicing and the combination of the sales ledger and invoice circulation software) have caused different kinds of hinders and delays for several of the respondent companies. Some have been struggling with the sheer number of different systems that have been in use within the group. Almost all respondents expressed that the concentration of accounting functions into service centres has had a significant enabling impact on the digitalization process also in terms of systems.

Group E, the controller of the SSC:

“The service centre model has enabled the use of some software that we would not have necessarily been able to implement in each unit if the accounting would not have been centred. .. The service centre model has promoted the digitalization in many ways but one significant feature is the great reduction in the number of systems that have been in use within the group. We have been able to give up tens of programs and over a hundred different software versions.”

On a Finnish scale the legislation has not been a hinder for the digitalization development. However the FIA project has aimed at creating solutions that would benefit also the authorities that need reporting from companies.<sup>16</sup> Getting the support of authorities is hoped to speed the progress of the digital solutions. Naturally these products will benefit also to the entrepreneurs and help ease their administrative burden. On an international level it is still easy to see why electronic invoicing on an international scale is challenging when you compare situation described in the response above to sending an invoice via post. (see Picture 8. The paths of a digital invoice (www.hse.fi, Penttinen, 2008))

The operators have established themselves as taken for granted players in the process of electronic invoicing both nationally and internationally. Along different operators have come also different invoice formats. In Finland alone there are three established formats: the Finvoice which is considered to be the Finnish standard invoice intermediated especially by banks, the TEAPPSXML created by Tieto and eInvoice created by Elma and now owned by Itella. On a European level, the competition for customers has created numerous other formats and of course the American companies have their own operators and formats too.

For the SME sector the banks and some smaller operators are important, because they support the Finvoice standard and offer simple services that are affordable. For the SME sector, one standard format is crucial. They cannot at least for now efficiently send invoices in multiple formats. Also models where the SMEs are forced to use portals where they can fill in their invoices are not seen as solutions that provide efficiency. As digital accounting requires knowhow on technology and systems with which most entrepreneurs with small companies don't know and cannot afford, this is the place for accountancy offices to establish themselves as the service providers for the SME sector. The use of digital systems is seen as a factor that would improve the processes of the accounting offices and at the same time widen their scope of services that they can offer to their customers. For some of the SMEs the leap into the digital systems is in practice a lot bigger then it has been to the large companies. Most SMEs and accounting offices are still processing invoices and vouchers on paper. The use of IT

<sup>16</sup> (See reporting codes ([http://www.hse.fi/EN/research/t/p\\_7/RTE/fia/reports/](http://www.hse.fi/EN/research/t/p_7/RTE/fia/reports/)), Ide-a ([http://www.hse.fi/EN/research/t/p\\_7/RTE/fia/idea/](http://www.hse.fi/EN/research/t/p_7/RTE/fia/idea/)) and the account reference ([http://www.hse.fi/EN/research/t/p\\_7/RTE/fia/reference/](http://www.hse.fi/EN/research/t/p_7/RTE/fia/reference/)))

systems is a lot less efficient or in some cases virtually nonexistent. These circumstances are altering the roles of accountancy offices in the financial administration of SMEs.

The responsibility of holding the digital accounting front together in terms of standards and their application has often been left on the shoulders of the operators and service providers. There is a real need for a responsible authority to be established at least on a national level. Based on the observations of the researcher, the supply side of the innovation is already calling for one. As a fairly scattered group, with the help of an assigned management organisation the finding and promotion of common goals would be significantly eased.

Even though Finland is one of the leading countries in e-invoicing there are still contrarians<sup>17</sup> who hinder the progress of the diffusion. The positive side to this phenomenon is that it raises discussion but it also hinders the diffusion as the opinions have also found support and take time and effort from the supply side of diffusion. In this research the contrarians have either been opposed to the development altogether or resisted certain attributes. The latter form of contrarians can also be seen as a possible reason for the variability of e-invoicing solutions as resistance of a basic standard has spawned competing standards and their implementation.

At least in the Finnish perspective, digital accounting and environmentally sound solutions seem to be issues of image as well as belonging to the group of companies in the forefront of this development. These had been important values for the case companies already from the start of the digitalization process and these views had grown stronger when the companies worked together to achieve common good. The appearance of a “high tech” and leading user of new technology was important, because it was not always easy to combine the image benefits of saving paper in to the overall image of a company. The comments of the manager of accounts payable in a power company and the chief of invoicing in a media group summarised well the vision of all the case companies:

Group C, the manager of accounts payable:

“It is also a question about image for us, that we are involved in this; it’s not just a question of efficiency. There are also the environmental issues and networking.”

<sup>17</sup> The Finnish translation is *vastarannankiiskit*.

Group A, the chief of invoicing:

“When we are talking about the sales invoicing in electronic form, the motivations come from customer service, improved efficiency and quality and also environmental issues have been discussed even though they haven’t been marked with the biggest font.”

Of the supporting factors, the most important ones found in this thesis are the efforts for standardisation, co-operation networks and the development of accounting systems and organisation. The changes in accounting systems are crucial, because they have been needed in order for the innovation in question to function. The changes in organisation have been a great support to the digitalisation development so far for example in the form of establishing service centres and centring the processing on invoices. This can be concluded as all of the case companies had one or more services centres and they all connected the digitalisation development into the forming of these centres both as a feature that digitalisation had made possible and as a change which supports the digitalisation.

The co-operation networks like FIA and FeCN are seen as supporting organisations by both the supply and demand side albeit the views on the importance varied among the interviewees from the case companies. The importance of the networks can also be found in the existing research and in the absence of formal networks the importance of the informal ones rises. The networks have provided support as they have been forums where the case companies have discussed their common problems and shared ideas. This way the case companies have for example shared information on the progress of diffusion in their cases and discussed bandwagoning efforts like sending the letters asking for e invoices. Through the networks communication has been assisted also between the supply and demand sides and in addition external parties such as representatives of authorities and the state have been involved in the development of solutions. The importance of these networks shows in the continuous, voluntary participation of representatives of different organisations.

Standardisation is a supporting factor which all of the case companies believed would help the diffusion. Correspondingly some of the representatives of the supply side of the diffusion also spend considerable amounts of time and effort on standardisation both on national and on a European level. This is important for the diffusion, because it helps “in getting the long tail (of smaller companies) onboard” as for them either a common standard or the relatively

seamless integration of existing invoice formats is crucial in terms of finding a profitable solution. Also from a Finnish point of view the fact that Finland is strongly represented and involved in the creation of a European standard is important in order for a Finnish voice to be heard and in addition for getting the latest information on the international development.

In spite the efforts of the networks in promoting the diffusion and finding common solutions both in the interviews and the meeting observations a longing for a single responsible authority both on a national and EU level for digitalisation and e-invoicing showed. The interviewees felt that the development could have been significantly speeded up by the fact that such an authority existed. They also believed that it would have helped standardisation and the enforcing of standards and in addition have some control over the supply side of diffusion i.e. the operators and solution providers. Also the representatives of at least one operator supported similar thinking although currently they felt that the need for this exists especially on EU level. Also as the problems related to the pricing and agreement policies of operators (which makes comparison between different operators difficult) and for example the issues in conversion between different formats were seen as problems that could be helped by a single responsible authority, the importance of this hindering factor is noteworthy.

As digitalisation benefits rely partly on the wide diffusion of the innovation, the competing non digital solutions such as PDF invoices are a great hinder for the spreading of innovation. This hindering factor has been supported by software providers and operators who offer it as a digital solution as e invoices are. This is misleading as the benefits of digitalisation are not shown correctly if the only difference is that the image of the invoice is not printed on paper but on a PDF file. The hindering factor is thus not limited only by the innovation being replaced by a non digital solution but also by sending misleading messages about digital solutions.

Change resistance cannot be disregarded among the important hinders of diffusion. The case companies faced it both in their internal operations and in contacting their suppliers and customers. Although the internal resistance was often said by the interviewees to be quite minimal, some recognised its existence and power. Although the resistance outside the companies was more visible, the problems in the internal diffusion were just as important. It contributed as a hinder via lack of promotion when needed and instead added to the problems by sending mixed messages from parties who officially wanted to promote the digitalisation.

On the side of external diffusion, the more visible resistance coming from SMEs troubled all case companies and the problems the SMEs had in terms of digitalisation were well understood among the large companies, despite the fact that they were ready to force the sending of e invoices.

As mentioned earlier, when looking at digitalisation internationally, all the respondents felt that the problems in digitalisation within the borders of Finland seemed fairly small. On an international scale the largest problems were related to legislation that made digitalisation virtually impossible and on the other hand the lack of an existing culture in utilising IT in accounting. This was naturally seen as a problem for large companies and the operators that were aiming at international markets. Correspondingly the situation gave Finland as a small country a better chance of impacting the European development due to its position as a forerunner of the diffusion.

## 5 DISCUSSION

The most important motivation found for diffusion in this thesis, the perceived efficiency of the innovation, was highlighted already in the existing research. Here what needs to be considered is how different representatives of the demand side of the diffusion go about reaching this goal or in what way they see that it can be achieved. In actor network theory it is said that actors with similar goals form alliances, but on the other hand different routes into reaching those goals can result in a situation where the innovation is not the same for everyone, which can hinder the diffusion. Similarly the problems related to differences in goals can also point out why the co-operation between representatives of the supply side of the innovation has been more difficult than it has been for the demand side.

Also harmonisation as a motivation found both in the interviews and meeting observations can be found in the existing literature as for example by Granlund and Lukka discuss the convergence of accounting practices globally. In the cases of this thesis the core of the issue was in the streamlining of internal processes even though more emphasis could also be given on unifying some parts of the invoicing procedures between companies. As an example limitations could be agreed on invoice content, which has been blown into huge proportions. If all companies would for example settle on only the information required by the law, standardising invoicing would be a whole different matter. When you add all the requirements that different companies have for the purposes of their internal accounting and top it up with demands on the image and layouts of invoices it is no wonder that standardising has been found difficult and there is a market for different standards even in a country as small as Finland. Of course the service providers and operators have had their part in this development. Existing research points out a phenomenon called interpretive viability where a market is artificially grown via different versions and modifications of a standard. This somewhat describes what has happened as the number of formats and operators has grown rapidly.

Motivations that came up in this thesis, but were not mentioned in the existing research included the benefits received from centring processes, transparency and the scalability which were seen to improve via digitalisation. Also the motivation problems related to small companies which cannot benefit find benefits through the masses of invoices. This is natural,



because there was no previous research focusing on SME size companies. At the same time with the smaller companies the lack of solutions that could be seen as efficient ones was according to the interviews a major issue hindering the diffusion. Of the motivations found in the existing research the attributes of the innovation were left to fairly little attention in the responses received in the interviews.

Of the supporting factors the importance of networks and their action in forwarding the diffusion was found in both the existing research and the results of this thesis. Still based on the results this issue raised slightly contradicting views among the interviewees so the true impact and importance of co-operation might not be realised or accepted by all stakeholders. The existing research on promoting diffusion contains good considerations for the part of for example the actions needed for an innovation to diffuse.

In the existing research there was also an enlightening comment on diffusion: “the machine will work, when all relevant people are convinced.” (Latour, 1987, p. 10) which was set as an opposite to “once the machine works, people will be convinced”. This is a valuable comment to consider when thinking about where to put effort in forwarding the diffusion. So far most effort seems to be put in developing the innovation itself although it does not mean that the other half of convincing people would have been left undone. Though e-invoicing and digital accounting rely on the innovation to work, the efficiency of the innovation relies on the fact that the innovation is adopted by a large number of companies.

This issue is also related to the communication of the innovation and the theoretical considerations on the impact of distance between the innovator or promoter of the idea and the potential user. Based on the research done as a base of this thesis the distance can for example in the eyes of a SME seem quite long and even longer in an international context where there is not as similar existing culture where the innovation would naturally fit into. This is because for a smaller company digital accounting and e-invoicing are often still more complex solutions for the entrepreneur compared to handling the old paper invoices. Based on existing research on diffusion, this distance can be shortened by instructing and sharing information. The task is important for diffusion, because it is highly likely harmful for the diffusion if the innovation is seen as in the GPM case, to be so good that it will sell itself.

The source of the information on the innovation was seen as an important factor for diffusion in existing research. Software and system sellers were not necessarily seen as an influential group in terms of promoting the innovation whereas the role of impartial experts, internal change agents and early adopters was emphasised. Controversially publicity in newspapers had been found potentially harmful. Based on the results of the interviews the role of early adopters was found to be important but so was the role of software sellers and consultants as well. Many of the case companies had heard of the innovation from a representative of the latter groups. Publicity in newspapers or any other media for that matter was not seen as harmful for the diffusion, but quite the opposite. In the view of the respondents, the importance of the early adopters was emphasised in this case due to their size which resulted in them having considerable power in forcing the diffusion of the innovation and their active bandwagoning efforts. Among large groups many of the case companies also saw themselves as pioneers and trendsetters of an efficient and in addition an environmental solution.

The views on the power of the early adopters were also a reason why some of the case companies criticised the state of Finland for its slow action in taking part in the development. Now the state has already stepped up and announced that it will accept only e-invoices from the beginning of January 2010. Soon it is time for the cities to join the development. On a national and European scale the potential benefits were seen to be so significant that in the eyes of some representatives of the supply side the governments could take a bigger, driving role to speed up the diffusion. Naturally the state was seen as an important institution in the diffusion process also due to the experiences heard from Denmark where the actions taken by the state have been decisive in speeding up the development. In the existing research on the diffusion of accounting innovations Lapsley and Wright (2004) had found that the new innovations required often government pressure for diffusion on the public sector. This might help explain the seemingly slow development on the public sector in Finland and for its part highlight the importance of the involvement of the state. From the interviews it could be concluded that it would be natural for the state to take an active role in supporting the diffusion as also the savings potential is so significant. In addition to the cost savings and cutting the administrative burden of companies, the support on transparency in B2B transactions was seen as an important factor supporting the involvement of the state that rose in the discussion on the supply side of the diffusion. As electronic invoices have travelled through the systems of authorised operators and are stored in an electronic form they were

seen to be much harder to forge than paper receipts. This was seen as an important aspect when considering for example VAT fraud on a European scale.

Regarding diffusion of digital accounting Finland is on a European boat. Based on the presentations given in a European e-invoice conference, the EXPP Summit, the solution models offered in Finland do not significantly differ from those offered in Europe in general, which is natural as there are a lot of operators providing solutions for European markets. The Finnish culture for utilising technology seems to be an important difference as it has kept the authentic digital solutions well ahead of the non-digital PDFs and made Finland currently one of the leading countries in e-invoicing. The problems found in the co-operation between operators had also been noted in the earlier research by Penttinen et al. Also the problems related to the lack of a common European standard are clearly visible. This view is supported by the responses received from the case companies as they were planning to take the e-invoice practices from Finland abroad and hope to spread them well beyond their own organization. This aim is yet supported by the efforts made by the European Expert Group on e-Invoicing and the European Commission to find a common digital invoicing standard for the whole EU to claim the productivity potential available. However, hindrances that run as deep as in international legislation take time to solve. (Final report, European Expert group on e-invoicing)

There is great potential efficiency in e-invoicing for both big and small companies. Compared to EDifact, a major keystone for digital accounting, sending and receiving e-invoices is easy as it is nowadays supported by most ledger handling software. As helpful as EDI solutions have been for the spreading and creation of e-invoices they could not have become a solution for the masses. From the Finnish perspective the fact that there is a standard Finvoice format, makes it possible for a multitude of competing applications to exist and gives all companies the possibility to send and receive electronic invoices. This does not however mean that the application would be necessarily profitable for all concerned. For example the number of sent and received invoices and the number and size of customers and suppliers can have a major effect on the “profitability” of using digital methods in invoicing. Correspondingly the problems related to the spreading of the innovation are focused on the smaller end of the SME sector. There it is, at least currently, more difficult to benefit from the innovation or at least it can be said that the benefits are relatively small compared to those available for a large listed

company. Therefore continuing the development of profitable digitalisation solutions for SMEs is important both in Finland and internationally.

In the meeting observations and interviews SMEs were often portrayed in connection to change resistance. Companies that were holding on to the use of paper and old processes were seen as contrarians, difficult hinders for the diffusion. Very little focus was also put in discussing how e-invoicing and digitalisation would fit the routines of SMEs. In existing research change resistance has been studied widely. The resistance has been divided according to internal diffusion and diffusion between companies. In the interviews the resistance between companies got much more attention than the resistance concerning internal diffusion. Some interviewees pointed out problems that they have had in for example processing received invoices. However issues related to internal diffusion in the sense that all the representatives of a group who are buyers or make agreements, should all ask for an e invoice. As also in the research by Basware the phase when negotiating new agreements could be one of the most efficient situations to get new e-invoices.

## 5.1 Conclusions

The most important factors impacting the diffusion of digital accounting are: the efficiency potential of e-invoicing, development on a European scale, coercive pressures including standards, legislation and forcing and simplifying digitalisation. For all of these factors, networking is an important influence. Supporting standards and sending a common message from the adopters and promoters of the innovation would be an important asset to speed the diffusion. A lot of important efforts have already been done, but a lot still remains as for example the large companies develop their knowhow on e-invoices both internally and in co-operation with others. The impact of the state in promoting digital solutions is expected to be significant in the nearby future.

A deeper analysis of the development leaves room for further research, as this research describes one short phase of in the beginning of the diffusion process. Thus research covering a longer timeframe could provide additional information. Based on literature on the diffusion of innovation, electronic invoices have their limited lifecycle too. It is most likely that someday the innovation is replaced by for instance a more efficient or fashionable solution

and thus rejected. This line of thought is supported by some of the comments made by the interviewees about for example selfinvoicing which can be seen as a competing model for the digitalization based on e-invoices. However if the digital solutions get a firm foothold on the SME markets, based on the bandwagon pressures and the nature of the innovation (efficiency benefits grow together with the number of adopters) the innovation has a good chance for lasting a long time. This is also supported by the fact that there are currently no solutions that would change the process so dramatically that invoicing as we now know it would no longer be necessary.

For future research and to get a better view of the impacting factors in the important SME sector a survey could also be done to find out the factors that get small enterprises to start or to abandon e-invoicing and digital solutions. Also research on the diffusion's progress in other EU countries and the US let alone in Asia, where so many service centres have been established, would be very useful. As well as studies on the differences in the promotion of the innovation in different countries could help understand the future international development.

## 6 REFERENCES

### Articles and books

Abrahamson, E., 1991. Managerial fads and fashions: The diffusion and rejection of innovations. *Academy of Management Review*, 1991, vol 16, No 3, 586-612.

Ahrens, T., Dent, J. F., Accounting and organizations: Realising the richness of field research. *Journal of management accounting research*, vol 10, p. 1-39.

Alcouffe, S., Berland, N., and Levant, Y., 2008. Actor-networks and the diffusion of management accounting innovations: A comparative study. *Management Accounting Research*, 19, 1-17.

Arjen tietoyhteiskunnan neuvottalukunta, 2009. Sähköisen laskituksen työryhmä: toimenpiteet verkkolaskun edistämiseksi

Arnold, V., 2006. Behavioral research opportunities: Understanding the impact of enterprise systems. *International journal of accounting information systems*, 7, p.7-17.

Atkins, A., Balakrisnan, R., Booth, P., Cote, J.M., Groot, T., Malmi, T., Roberts, H., Uliana, E. and Wu, A.,1997. New directions in management accounting research. *Journal of management accounting research* vol 9, p. 79-108.

Attewell, P., 1992. Technology diffusion and organizational learning: The case of business computing. *Organizational Science*, vol 3, No.1 p 1-19.

Ax, C., Bjørnenak, T., 2005. Bundling and diffusion of management accounting innovations – the case of balanced scorecard in Sweden. *Management Accounting Research*, 16, 1-20.

Baxter, J., Chua, W.F., 2003. Alternative management accounting research—whence and whither. *Accounting Organizations Society*, 28, 97–126.

Bjørnenak, T., 1997. Diffusion and accounting: The case of ABC in Norway. *Management Accounting Research*, no. 8, p. 3-17.

Burns, J and Scapens, R.W., 2000, Conceptualizing management accounting change: an institutional framework. *Management Accounting Research*, 2000, 11, 3-25.

Burns, J. and Vaivio, J., 2001. Management accounting change. *Management Accounting Research*, 12, 389–402.

Busco, C., Quattrone, P., and Riccaboni, A., 2007, Management Accounting Issues in interpreting its nature and change. *Management Accounting Research* 18, 125–149.

Busco, C., Riccaboni, A. and Quatrone, P. 2007. Management accounting issues in interpreting its nature and change. *Management Accounting Research* 18, 125–149.

Granlund, M. and Lukka, K., 1998x. Towards increasing business orientation: Finnish management accountants in a changing cultural context. *Management Accounting Research*, 9, 185–211.

Granlund, M. and Lukka, K., 1998y. It's a small world of management accounting practices. *Journal of Management Accounting Research*, vol 10, 153-179.

Hopwood, A. G. 1978. Towards an organizational perspective for the study of accounting and information systems. *Accounting, Organizations and Society* vol 3, no 1, 3-13.

Kimberly, J. (1981). Managerial innovation. In P. C. Nyström, and W. H. Starbuck (Eds.), *Handbook of organizational design* (pp. 84-104). New York: Oxford University Press.

Lapsley, I and Wright, E., 2004. The diffusion of management accounting innovations in the public sector: a research agenda, 15, p. 355-374.

Lieberman, M.,B. and Asaba, S., 2006. Why do firms imitate each other? *Academy of Management Review*, vol 31, no 2, 366-385.

Lillrank, P., 1995. The transfer of management accounting ideas from Japan. *Organizational studies*, 16, 971-989

Lucas, M., Rafferty, J., 2008, Cost analysis for pricing: Exploring the gap between theory and practice. *The British Accounting Review* 40, 148–160

Malmi, T., 1999, Activity-based costing diffusion across organizations: an exploratory empirical analysis of Finnish firms. *Accounting, Organizations and Society* 24, 649-672.

Mansfield, E., 1963. Intrafirm Rates of Diffusion of an Innovation. *The Review of Economics and Statistics*, 45 (4), p. 348-359

Miller, P. and O’Leary, T.,1990. Making accountancy practical. *Accounting, Organizations and society*. Vol 15, No 5, p. 479-498)

Moss Kanter, Rosabeth, 2006,xx, *Harward Business Review* vol 84 issue 11 p. 73-83

Penttinen, E. (Ed.) (2008). *Electronic Invoicing Initiatives in Finland and in the European Union – Taking the Steps towards the Real-Time Economy*. Contributors Dorota, K., Harald, B., Hyytiäinen, M., Kuivalahti, T., Penttinen, E., Poteri, J. and Turunen, T. Helsinki School of Economics series B-95.

[Penttinen, E. & Hyytiäinen, M. \(2008\)](#). The Adoption of Electronic Invoicing in Finnish Private and Public Organizations. *European Conference in Information Systems (ECIS)*, Dublin, Ireland, June 8-11 2008.

Ribeiro, J.A., Scapens, R.W., 2006. Institutional theories in management accounting change. *Qualitative Research in Accounting and Management* 3, 94–111.

Rogers, E. M. (1983). *Diffusion of innovations* (3rd ed.). New York: Free Press.

Scapens, R.W., 1990. Researching management accounting practice: The role of case study methods. *British accounting review*, 22, 259-281.



Scapens, R.W., 1994. Never mind the gap: Towards an institutional perspective of management accounting practice. *Management Accounting Research*, 5, 301-321.

Sipilä, T. (2008) Miten nopeuttaa sähköisen laskutuksen käyttöönottoa Suomessa? ”How to promote the implementation of electronic invoicing in Finland?” (In Finnish). MSc thesis at HSE (no 10819)

Soin, K., Seal, W. and Cullen, J., 2002. ABC and organizational change: An institutional approach. *Management accounting research*, 13, p. 249-271.

Swan, J., Newell, S. and Robertson, M., 1999. Central agencies in the diffusion and design of technology: A comparison of the UK and Sweden. *Organization studies*, 20/6, p. 905-931.

Verstegen, B.H.J., 2006. Relating the institutional approach in management accounting to Institutional Economics: An Essay on Dual-mode Rationality. *Journal of economic issues*, No 4.

### **Web pages**

Deutsche bank, 2009 [http://www.dbresearch.com/PROD/DBR\\_INTERNET\\_EN-PROD/PROD0000000000245196.pdf](http://www.dbresearch.com/PROD/DBR_INTERNET_EN-PROD/PROD0000000000245196.pdf) accessed 4.3.2010

Final report, European Expert group on e-invoicing, [http://ec.europa.eu/enterprise/newsroom/cf/document.cfm?action=displayanddoc\\_id=5544anduserservice\\_id=1andrequest.id=0](http://ec.europa.eu/enterprise/newsroom/cf/document.cfm?action=displayanddoc_id=5544anduserservice_id=1andrequest.id=0) accessed 30.12.2009

[http://akseli.tekes.fi/opencms/opencms/OhjelmaPortaali/ohjelmat/INTO/fi/Dokumenttiarkisto/Viestinta\\_ja\\_aktivointi/Seminaarit/RTEsummit/Bruno\\_Koch\\_Billentis.pdf](http://akseli.tekes.fi/opencms/opencms/OhjelmaPortaali/ohjelmat/INTO/fi/Dokumenttiarkisto/Viestinta_ja_aktivointi/Seminaarit/RTEsummit/Bruno_Koch_Billentis.pdf), accessed 17.2.2010

[http://www.basware.com/FI/Documents/Yhteyspalvelut/Kysely\\_raportti\\_verkkolaskutus.pdf](http://www.basware.com/FI/Documents/Yhteyspalvelut/Kysely_raportti_verkkolaskutus.pdf), accessed 17.2.2010

<http://www.dimes.fi/fi/yhdistys>, accessed 20.12.2009

[http://www.ek.fi/www/fi/uutiset/index.php?we\\_objectID=8425](http://www.ek.fi/www/fi/uutiset/index.php?we_objectID=8425), accessed 17.2.2010

<http://www.hawcon.fi/> accessed 20.12.2009

<http://www.hse.fi/EN/frontpage>, accessed 20.12.2009

[http://www.hse.fi/EN/research/t/p\\_7/RTE/fia/](http://www.hse.fi/EN/research/t/p_7/RTE/fia/) accessed 20.12.2009

[http://www.hse.fi/NR/rdonlyres/D91F488F-6CD4-4D84-9F33-3C062EE8083B/0/RTE\\_ohjelma.pdf](http://www.hse.fi/NR/rdonlyres/D91F488F-6CD4-4D84-9F33-3C062EE8083B/0/RTE_ohjelma.pdf), accessed 30.12.2009

<http://www.kauppalehti.fi/5/i/talous/uutiset/avoinarkisto/index.jsp?xid=2154337&date=2006/11/30>, accessed 17.2.2010

[http://www.stat.fi/tup/suoluk/suoluk\\_yritykset.html#aloittaneetjalopettaneet](http://www.stat.fi/tup/suoluk/suoluk_yritykset.html#aloittaneetjalopettaneet), accessed 7.3.2010

<http://www.taloushallintoliitto.fi/taloushallintoliitto/> accessed 20.12.2009

<http://www.taloussanomat.fi/pdf/200322145>, accessed 17.2.2010

[http://www.tieke.fi/in\\_english/](http://www.tieke.fi/in_english/) accessed 21.4.2009

[http://www.tieke.fi/julkaisut/oppaat\\_yrityksille/sahkoisen\\_kaupankaynnin\\_aapinen/miten\\_aapinen\\_auttaa\\_yritysta/sahkoisesta\\_kaupankaynnista\\_saat/](http://www.tieke.fi/julkaisut/oppaat_yrityksille/sahkoisen_kaupankaynnin_aapinen/miten_aapinen_auttaa_yritysta/sahkoisesta_kaupankaynnista_saat/) accessed 30.6.2009

<http://www.tieto.com/default.asp?path=1,92> accessed 20.12.2009

[http://www.tietokone.fi/uutiset/2006/verkkolaskut\\_kuluttajille\\_ensi\\_vuonna](http://www.tietokone.fi/uutiset/2006/verkkolaskut_kuluttajille_ensi_vuonna), accessed 17.2.2010

[http://www.tietoviikko.fi/taustat/kaikki\\_jutut/article132674.ece](http://www.tietoviikko.fi/taustat/kaikki_jutut/article132674.ece), accessed 17.2.2010

<http://verkkolasku.tieke.fi/>, accessed 7.3.2010

[http://www.yrittajat.fi/fi-FI/suomen\\_yrittajat/tutkimukset/verkkolaskupalvelut2009/](http://www.yrittajat.fi/fi-FI/suomen_yrittajat/tutkimukset/verkkolaskupalvelut2009/), accessed 18.12.2009

<https://www.aditro.com/default.aspx?path=209372,209403>, accessed 20.12.2009

Statistics Finland (1) [http://tilastokeskus.fi/til/syr/2007/01/syr\\_2007\\_01\\_2009-02-10\\_kat\\_001.html](http://tilastokeskus.fi/til/syr/2007/01/syr_2007_01_2009-02-10_kat_001.html) accessed 30.6.2009

Statistics Finland (2) [http://tilastokeskus.fi/til/ict/2008/ict\\_2008\\_2008-11-20\\_kuv\\_032\\_fi.html](http://tilastokeskus.fi/til/ict/2008/ict_2008_2008-11-20_kuv_032_fi.html) accessed 30.6.2009

Valtiokonttori website 1: Valtio vastaanottaa tämän vuoden jälkeen vain verkkolaskuja  
<http://www.valtiokonttori.fi/Public/default.aspx?contentid=27382andnodeid=15830>, accessed 22.7.2009

Valtiokonttori website 2: Valtaosa valtion lähettämistä laskuista on kohta tarjolla verkkolaskuina  
<http://www.valtiokonttori.fi/Public/default.aspx?contentid=28282>, accessed 22.7.2009

Valtiokonttori website 3: Valtio ja yritykset tekevät yhdessä e-laskua tunnetuksi  
<http://www.valtiokonttori.fi/Public/default.aspx?contentid=26767andnodeid=15830>, accessed 22.7.2009

## **Attendance to conferences**

European EXPP Summit 2009, Amsterdam 21.-22.9.2009

<http://www.expp-summit.com/review.htm>, accessed 30.12.2009

e-invoice forum 2010, Helsinki 2.3.2010

<http://www.e-financeforum.com/2010/02/e-invoice-forum-2010-hilton-helsinki-kalastajatorppa-march-2nd-2010/>

## **Interviews**

Group C, 2.-3.4.2009

Group B, 20.5.2009

Group D, 4.6.2009

Group E, 11.6.2009

Group A, 15.6.2009

Group F, 6.7.2009

Group F, 21.9.2009

## **Workshops**

Taloushallintoliitto, 8.1.2009 klo 13-15: Käynnistetään Fully Integrated Accounting – projektin 1. osaprojekti liittyen yhteisen tilikartan mallintamiseen.

Tieto, 17.3.2009 klo:12-16: FIA workshop sähköinen tiliöintiviite

HSE, 6.4.2009, klo: 12-16: FIA workshop tilikoodisto

FeCN tapaaminen, 15.4.2009. Wärtsilä Helsinki.

Aditro, 15.5.2009, klo: 12-16: FIA Prosessit työpaja

Tieto, 10.8.2009, klo:9-11: Hawcon TITO kassa palaveri. Ehdotus pk-yrityksen sähköisen taloushallinnon järjestämisestä

## 7 APPENDICES

### 7.1 Appendix 1: Interview questions

A master's thesis on the diffusion of innovation in digitalizing accounting

Name:

Position in the organisation:

What is, in your opinion the role of accounting in your organisation?

What kind of electronic solutions do you already have in use in your organisation?

What solutions are you planning to implement? (Edifact, sending or receiving e-invoices)

Which electronic solution will you implement next?

Is a part of your accounting process outsourced? (For example salary calculation) and why have you outsourced it?

Are there specific features in your area of business that impact the accounting process or how your accounting is organised?

Is developing accounting usually a part of a larger entity (like for example developing an IT system) or more of an independent process?

How well does the digitalisation development in accounting fit the routines of the organisation?

How would you describe the progress of the digitalization process of accounting in your organisation?

Where has the idea originally come from?

Why is digitalization been done in your organisation?

Which factors have promoted the digitalization and which hinders have you faced in the process?

Which facets outside your own organisation have affected the digitalisation development so far and which will from now on?

Why has this factor had an influence?

Who does the decisions and suggestions on the development of accounting in your organisation?

At what level are these issues discussed in your organisation and do the people working in “the grass roots”-level (i.e. invoice processing) participate in the development of the process?

What are the most important goals of the accounting process in your organisation?

Do you feel that your view or the general view at the accounting department is far from the view of the management of your organisation?

Does the accounting process currently fulfil its purpose well?

What goals have been set for digitalizing accounting?

How have these goals been formed?

How is their development been monitored?

If you would get the chance to change something in the past process or in its future development what would you change?

What is the most important issue you have learned in this process?

## 7.2 Appendix 2: Pricing of e-invoicing solutions (using of ledger software)

**Taulukko 1.**  
Taloushallinto-ohjelmaan yhdistettävät verkkolaskuratkaisut. Hinnat eivät sisällä arvonlisäveroa.  
Alv-kanta 22 %.

		Verkkolaskupalvelu saapuville laskuille	Verkkolaskupalvelu lähteille laskuille
<b>Basware</b>	Käyttöönottomaksu, euroa	alkaen 870,00	alkaen 870,00
	Kuukausimaksu, euroa/kk	alkaen 100,00	alkaen 100,00
	Laskukohtainen maksu, euroa/lasku	0,24–0,32	0,24–0,32
	Muuta	Erilliset käyttöönotto- ja kuukausimaksut saapuville ja lähteille laskuille. Molempien palveluiden käyttöönotto samanaikaisesti voi alentaa käyttöönottomaksuja.	
<b>Enfo</b>	Käyttöönottomaksu, euroa	1050,00–1200,00	1050,00–1200,00
	Kuukausimaksu, euroa/kk	50,00–70,00	50,00–70,00
	Laskukohtainen maksu, euroa/lasku	0,16–0,20	0,27–0,35
	Muuta	Erilliset käyttöönotto- ja kuukausimaksut saapuville ja lähteille laskuille. Molempien palveluiden käyttöönotto samanaikaisesti voi alentaa käyttöönottomaksuja.	
<b>Maventa</b>	Laskukohtainen maksu, euroa/lasku	0,00	0,00–0,25
	Muuta	Saapuvat laskut ilmaisia. Lähtevien verkkolaskujen välitys Maventan asiakkaille on ilmaista, välityksestä muiden operaattoreiden kautta peritään 0,05–0,25 euroa/lasku.	
<b>Norfello</b>	Laskukohtainen maksu, euroa/lasku	Ei palvelua	0,60
	Muuta	Ei tarjoa verkkolaskupalvelua saapuville laskuille. Palvelu on tulossa palveluvalikoimaan. Lähtevien laskujen välityspalvelu nimellä Postita.fi.	
<b>Notebeat</b>	Käyttöönottomaksu, euroa	alkaen 120,00	
	Kuukausimaksu, euroa/kk	26,00–500,00	
	Muuta	Yhteinen palvelu saapuville ja lähteille laskuille.	
<b>Palanet</b>	Käyttöönottomaksu, euroa	740,00	740,00
	Laskukohtainen maksu, euroa/lasku	0,23	0,12
	Muuta	Erilliset käyttöönottomaksut saapuville ja lähteille laskuille. Molempien palveluiden käyttöönotto samanaikaisesti voi alentaa maksuja. Laskujen lisäsivusta peritään 0,06 euroa/sivu.	
<b>Tieto Finland</b>	Käyttöönottomaksu, euroa	900,00	
	Kuukausimaksu euroa/kk	300,00	
	Laskukohtainen maksu, euroa/lasku	alkaen 0,25	alkaen 0,25
	Muuta	Yhteinen palvelu saapuville ja lähteille laskuille.	

### 7.3 Appendix 3: Pricing of e-invoicing solutions (without using ledger software)

Taulukko 4.

Pankkiyhteysohjelmalla käytettävät verkkolaskupalvelut. Hinnat eivät sisällä arvonlisäveroa.

Palveluiden alv-kannat: Pankkiyhteysohjelman kustannukset alv 0 %, muut taulukossa esitetyt palvelut alv 22 %.

		Verkkolasku- palvelu	Saapuvat laskut	Lähtevät laskut	Pankkiyhteys- ohjelma
<b>Aktia</b>	Kuukausimaksu, euroa/kk		4,10	4,10	14,00
	Laskukohtainen maksu, euroa/lasku		0,20	0,20	
	Muuta	Pankkiyhteysohjelman kustannuksia ei huomioidu.			
<b>Handelsbanken</b>	Käyttöönottomaksu, euroa				120,00
	Kuukausimaksu, euroa/kk		4,10	4,10	10,00
	Laskukohtainen maksu, euroa/lasku		0,20	0,20	
<b>Nordea</b>	Käyttöönottomaksu, euroa		50,00	50,00	
	Kuukausimaksu, euroa/kk		4,10–163,93	4,10–163,93	
	Laskukohtainen maksu, euroa/lasku		0,20–0,37	0,12–0,29	
	Muuta	Pankkiyhteysohjelman kustannuksia ei huomioidu.			
<b>OP-Pohjola</b>	Käyttöönottomaksu, euroa	16,39			
	Kuukausimaksu, euroa/kk				4,00
	Laskukohtainen maksu, euroa/lasku		0,20	0,20	
	Muuta	Lisämaksu muille pankeille reititettävistä laskuista 0,05 euroa/lasku.			
<b>Sampo</b>	Käyttöönottomaksu, euroa				100,00
	Kuukausimaksu, euroa/kk				6,00
	Laskukohtainen maksu, euroa/lasku		0,29	0,20	
	Muuta	Pankkiyhteysohjelman asiakastunnukset 5 euroa kuukaudessa/ asiakastunnus.			
<b>Suupohjan Osuuspankki</b>	Käyttöönottomaksu, euroa	16,39			60,00
	Kuukausimaksu, euroa/kk		1,50	1,50	
	Laskukohtainen maksu, euroa/lasku		0,25	0,25	
	Muuta	Kuukausimaksut ovat minimimaksuja, joiden ylittyessä peritään laskukohtainen maksu.			
<b>Ålandsbanken</b>	Käyttöönottomaksu, euroa	20,00			50,00
	Kuukausimaksu, euroa/kk				20,00
	Laskukohtainen maksu, euroa/lasku		0,00	0,25	



## 7.4 Appendix 4: Introduction of the FIA project

### IDE-a

#### IDE-a – Taloushallinnon sähköinen palveluratkaisu pk-yrityksille

FIA-hankkeessa kartoitetaan mahdollisuuksia verkkolaskun ja muiden kirjanpidon dokumenttien tehokkaampaan sähköiseen hyödyntämiseen. FIA-hankkeessa kehitteillä oleva IDE-a tarjoaa pienelle yritykselle mahdollisuuden parempaan kassanhallintaan yrityksen käyttäessä verkkopankkia tai muuta verkkolaskuoperaattoria. Palvelun avulla voitaisiin yhdistää lasku ja maksu sekä muu maksutapahtumiin liittyvä tarpeellinen aineisto aukottomasti tiliotteelle. Tavoitteena on maksuperusteinen kirjanpito, joka tarkoittaa sitä, että pienen yrityksen kirjanpidossa myynnin arvonlisävero voitaisiin tilittää maksuperusteisesti nykyisen lasku-, eli suoriteperusteisuuden sijaan.

Yleensä pienen pk-yrityksen kirjanpidon hoitaa tilitoimisto, joka noutaa sähköiset tiliotteet pankista omaan kirjanpitojärjestelmäänsä. Kassaperusteisen kirjanpidon tekeminen perustuu valtaosaltaan juuri tiliotteen käsittelyyn. FIA-hankkeen ehdotuksessa suurin osa tositteista on jo mukana tiliotteella. Näin ollen sähköisen tiliotteen mukana tulisivat tiedot maksutapahtumien lisäksi myös maksetuista verkkolaskuista sekä sähköisistä myyntilaskuista, joille on tullut suoritus. Lisäksi myös suuri osa muista maksutapahtumista olisi tiliotteella tositiveatimusten tasolla ja myös niiden käsittely voitaisiin tehdä tiliotteen perusteella. Tulevaisuudessa menettely voisi mahdollistaa esimerkiksi reaaliaikaisen alv-käsittelyn.

### **IDE-a:n hyödyt yritykselle**

Kassaperusteinen sähköinen kirjanpito tuo pk-yrityksille monia hyötyjä:

Yrityksen velat ja saatavat ovat helposti nähtävillä laskukohtaisine tietoineen

Erillisiä reskontraohjelmistoja ei tarvita

Aineistosta valtaosa on sähköisessä muodossa eikä erillistä kirjanpitoaineiston kokoamista kirjanpitoa varten tarvita

Tilitoimistolle tämä tarkoittaa sitä, että asiakkaiden aineistot ovat ajantasalla ja täydellisempiä, kirjanpitoa voidaan automatisoida pidemmälle ja työkuormaa voidaan tasoittaa tilitoimiston sisällä riippumatta asiakkaiden materiaalitoimituksista

Uuden verotilin vaatimukset ilmoitusten jättämisen aikatauluihin on helpommin toteutettavissa

Mahdollistaa yritysten hallinnollisen taakan keventämistä, joka on muun muassa työ- ja elinkeinoministeriön tavoitteena.

Luo mahdollisuuden sähköisen taloushallinnon käytön leviämiseen suomalaisia yrityksiä hyödyntävällä tavalla.

### **Lainsäädännölliset vaatimukset**

Pienten ja keskisuurten (pk) yritysten hallinnollisen taakan keventämiseksi on tehty EU-tasoisia ehdotuksia kassaperusteisen kirjanpidon sallimisesta ko. yrityksille. EU-laskutusdirektiivin muutosehdotuksessa on myös otettu kantaa pk-yritysten kassaperusteiseen kirjanpitoon, ja menettelyn sallimista suositellaan kaikille jäsenvaltioille. EU on suositellut, että jäsenvaltiot sallisivat maksuperusteisen alv-tilityksen yrityksille, joiden liikevaihto on alle 2 miljoonaa euroa.

FIA-hankkeessa esitetään, että kassaperusteinen sähköinen kirjanpito sallittaisiin Suomessa yrityksille, joiden liikevaihto on alle 500 000 € vuodessa. Ehdotuksessa ei vaadita tilinpäätöksen muuttamista maksuperusteiseksi.

Raportointikoodisto

Raportointikoodisto – Vuosisadan juttu!

Yksi FIA-hankkeen päätavoitteista on mallintaa uudenlainen raportointikoodisto ([raportointikoodisto.pdf](#)), jonka perustana on visio tulevaisuuden integroidusta taloushallinnosta.

Katso Vuokko Mäkisen puheenvuoro Tili- ja veropäivillä tammikuussa 2010. Video löytyy kahdessa osassa [Real-Time Economy Community](#) sivuilta.

Taloushallinnon työt monipuolistuvat ja esimerkiksi tilitoimistoissa ollaan vähitellen siirtymässä yksittäisten liiketapahtumien käsittelystä liiketoiminnan laajempaan tarkasteluun raportoinnin kautta. Tämä kehitys luo taloushallinnon alalle mielenkiintoisempia töitä, kun rutiinityöt vaihtuvat laajempien kokonaisuuksien hallintaan. Yritysten kirjanpitoon kuuluu kuitenkin edelleen paljon turhaa manuaalisesti tehtävää työtä, joka voitaisiin tulevaisuudessa hoitaa automatisoidummin ja reaaliajassa oikeiden työkalujen ollessa käytössä.

Taloushallinnon toimintaa tehostamalla on mahdollista saavuttaa miljardiluokan säästöjä edellyttäen, että taloushallinnon prosessit ovat kunnossa yritysten ja sidosryhmien välillä. Etenkin pienissä ja keskisuurissa yrityksissä haasteena on taloushallinnon toimintatapojen yhtenäistäminen, jotta liiketoimintaprosessien tehokas automatisointi olisi mahdollista. Työssä hyödynnetään aktiivisesti Taloushallintoliiton, Helsingin kauppakorkeakoulun ja tilitoimisto Hawcon Oy:n asiantuntemusta.

### **Hyödyt yrityksille ja viranomaisille**

Raportointikoodiston tarkoituksena on säädellä vain yrityksissä tehtävän sidosryhmäraportoinnin perusrunkoa, jolloin yritykset voivat itse määritellä koodiston taustalla olevat yrityskohtaiset sovelluksensa. FIA-hankkeessa mallinnettava raportointikoodisto voi kuitenkin tarvittaessa toimia pienemmille yrityksille myös tilikarttana.

Raportointikoodisto tuo helpotusta erityisesti yritysten viranomaisraportointiin. Tavoitteena on luoda helppokäyttöinen ja ajantasainen koodisto, joka pitää sisällään kaikki yrityksen pakolliset raportointivelvoitteet. Yhtenäiset raportointikäytännöt säästävät sekä yritysten että viranomaisten aikaa. Samalla yritysten taloushallinnon toiminta selkeytyy ja ennustettavuus lisääntyy.

Taloushallinnon prosessien automatisointi ja toimintatapojen yhtenäistäminen mahdollistavat raportointikoodiston linkittämisen mahdollisimman laajasti eri järjestelmätasoihin. Samasta järjestelmästä on mahdollista saada tasekirjat, tilinpäätökset, veroilmoitukset ja muut viranomaisraportoinnit.

### **Aikataulu**

Raportointikoodistoluonnos on valmis kommentoitavaksi vuoden 2009 loppuun mennessä. Luonnosta myös testataan käytännössä yhteistyössä verottajan kanssa syksyn aikana. Raportointikoodistoluonnos esitellään myös tarkemmin Tili- ja veropäivillä 18.-19.1.2009.

Ehdotus uudesta raportointikoodistosta on valmis FIA-hankkeen päättymiseen mennessä kesäkuussa 2010, jonka jälkeen Tili-instituuttisäätiöön perustettava raportointikoodistolautakunta jatkaa koodiston kehittämistä ja ylläpitämistä (Linkki: FIA-referenssiryhmä).

## **FIA-referenssiryhmä**

FIA-hankkeessa halutaan ottaa mahdollisimman laajasti eri sidosryhmien tarpeet huomioon ja sitä kautta käydä säännöllisesti läpi raportointikoodistotyön etenemistä. Tätä varten FIA-hankkeeseen on perustettu referenssiryhmä. Yritysten pakollista raportointia ja tiedon tarvetta kartoitetaan myös yhdessä pakollisten raporttien vastaanottajien kanssa (mm. Verohallinto, Tilastokeskus, Yritystutkimusneuvottelukunta, PRH).

Tavoitteena on, että FIA-hankkeen päätyttyä kesäkuussa 2010 referenssiryhmä jatkaa toimintaansa Tili-instituuttisäätiön alaisuuteen perustettavana raportointikoodistolautakuntana, joka vastaa jatkossa muun muassa hankkeessa luodun raportointikoodiston kehittämisestä, ylläpitämisestä ja viestinnästä.

FIA-referenssiryhmän kokoonpano:

Elinkeinoelämän keskusliitto: Asiantuntija Päivi Rätty

Finnish E-invoice Collaboration Network (FECN): Manager Masood Arai (Wärtsilä)

Fully Integrated Accounting (FIA) –projekti: Jyrki Poteri/Bo Harald (Tieto), Mikael Fagerholm (Aditro)

Finanssialan keskusliitto: Kehityspäällikkö Pirjo Ilola

Aalto-yliopiston kauppakorkeakoulu: Yliassistentti Hannu Ojala

Keskuskaupakamari: Laskentatoimen asiantuntija Tuomas Leino

Liikenne- ja viestintäministeriö: Apulaisosastopäällikkö Kristiina Pietikäinen

Pretax Oy: Liiketoimintajohtaja Minna Nikkola

Suomen Yrittäjät: Konserninjohtaja Antti Rantalainen (Rantalainen Oy)

Taloushallintoliitto: Toimitusjohtaja Juha Ahvenniemi

Tieke ry: Erityisasiantuntija Heikki Laaksamo

Tilastokeskus: Tilastopäällikkö Marja Sjöblom

Tulli: Talouspäällikkö Pekka Pylkkänen

Työ- ja elinkeinoministeriö: Neuvotteleva virkamies Mika Björklund

Työ- ja elinkeinoministeriön kirjanpitolautakunta: Tilinpäätösasiantuntija Virpi Haaramo (Rahoitustarkastus)

Verohallitus: Ylitarkastaja Johanna Kotipelto

Yritystutkimusneuvottelukunta: Palvelupäällikkö Ari Toivio (Suomen Asiakastieto)

Patentti- ja rekisterihallitus: Ilm. myöhemmin

FIA-referenssiryhmän kokousaikataulu on seuraava: 11.6.2009, 12.11.2009, 25.3.2010.

### Sähköinen tiliöintiviite

Sähköinen tiliöintiviite osaksi verkkolaskua

FIA-projektissa mallinnetaan ja pilotoidaan sähköinen tiliöintiviite, jonka tavoitteena on automatisoida laskun tiliöintiprosessia. Maksuviitteen avulla toimittaja on voinut jo pitkään kohdistaa maksut oikeaan laskuun. Vastaavalla tavalla ostaja voi automatisoida laskujen käsittelyä tiliöintiviitteen ja raportointikoodiston avulla.

Sähköisen tiliöintiviitteen avulla ostolaskut tiliöityvät automaattisesti kustannuskohteineen kierrätykseen. Tämä tarkoittaa sitä, että laskun tarkistus nopeutuu, sisäinen laskenta helpottuu ja laskujen tiliöintivirheet pienenevät. Prosessien nopeutuessa sähköinen tiliöintiviite säästää myös yritysten aikaa ja rahaa sekä mahdollistaa reaaliaikaisen talouden seurannan.

### Sähköisen tiliöintiviitteen konseptointi

FIA-projektissa laaditaan white paper -julkaisu kehitettävästä tiliöintiviitekonseptista. Konseptointi tulee sisältämään muun muassa sähköisen tiliöintiviitteen kuvauksen, erittelyn hyödyistä, soveltamisohjeet sekä suositukset ylläpitokysymyksiin. Julkaisussa kuvataan myös kaksi yritysesimerkkiä, joissa sähköinen tiliöintiviite on jo jollain tasolla käytössä. ALD Automotive on esimerkki sähköisiä laskuja lähettävästä yrityksestä, joka on saanut kilpailuetua tiliöintiviitteen integroimisesta asiakkaille lähteviin laskuihin. Unanimous Oy on taas esimerkki laskuja vastaanottavasta yrityksestä, joka on saanut tehostettua ostolaskujen käsittelyä hyödyntämällä tiliöintiviitteitä ostolaskujen käsittelyssään.

Kommentit sähköisen tiliöintiviitteen konseptiin voi lähettää Esko Penttiselle (esko.penttinen@hse.fi) [Linkki työstämäämme white paperiin](#).

### Tekninen totetus

Projektissa on tehty case-haastatteluja yrityksiin, jotka jo jollain tasolla hyödyntävät tiliöintitietoja osto- tai myyntilaskupuolella. Sähköisen tiliöintiviitteen teknisiä edellytyksiä on selvitetty mm. Tiedon ja Finanssialan keskusliiton kanssa. Konkreettisia testauksia viitteen välittämisessä tullaan tekemään kevään 2010 aikana. Tieto on tehnyt TEAPPSXML-sanomakuvauksiin tarvittavat päivitykset, jotta sähköisen tiliöintiviitetiedon välittäminen on

mahdollista. Finvoice-verkkolaskuformaattien osalta on selvitetty olemassa olevien kenttien hyödyntämistä sähköisen tiliöintiviitteen käyttöön.

Sähköisen tiliöintiviitteen käyttö verkkolaskulla:

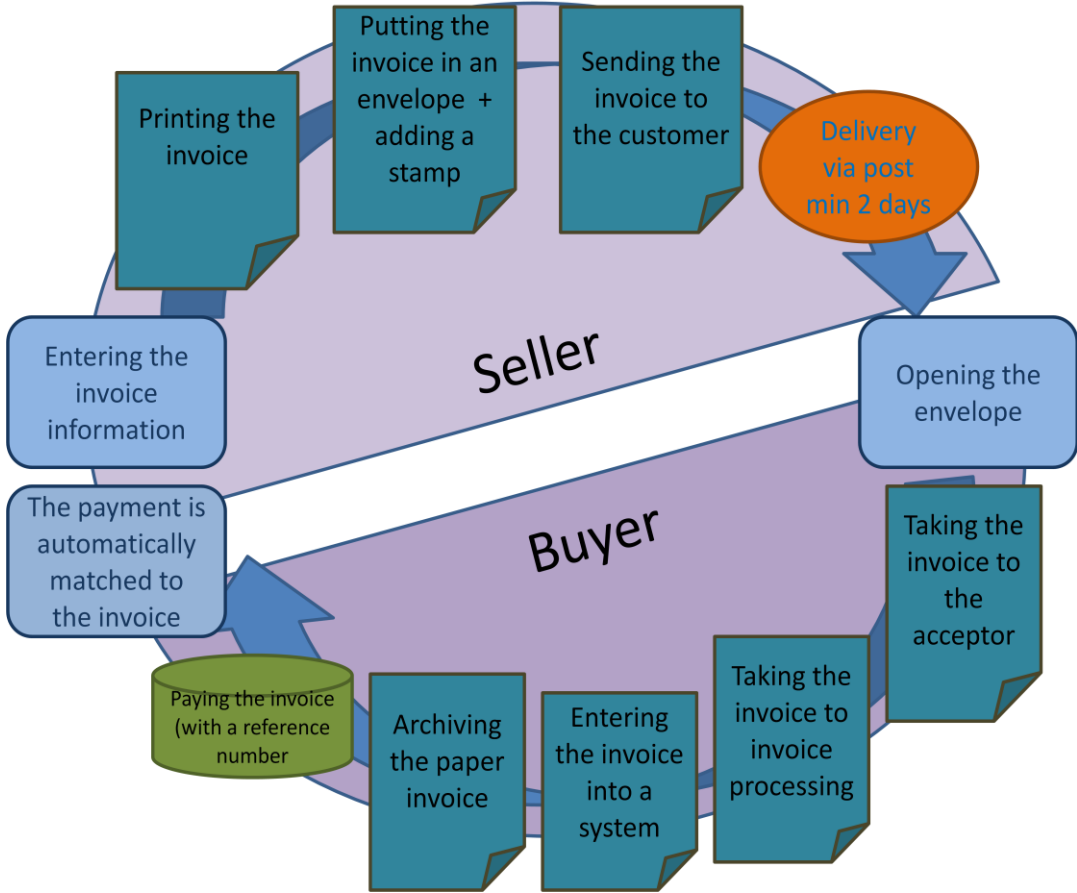
Finvoice 1.3 (RowAccountDimensionText)

TEAPPSXML 2.7.1 (ACCOUNT\_REFERENCE)

### **Aikataulu**

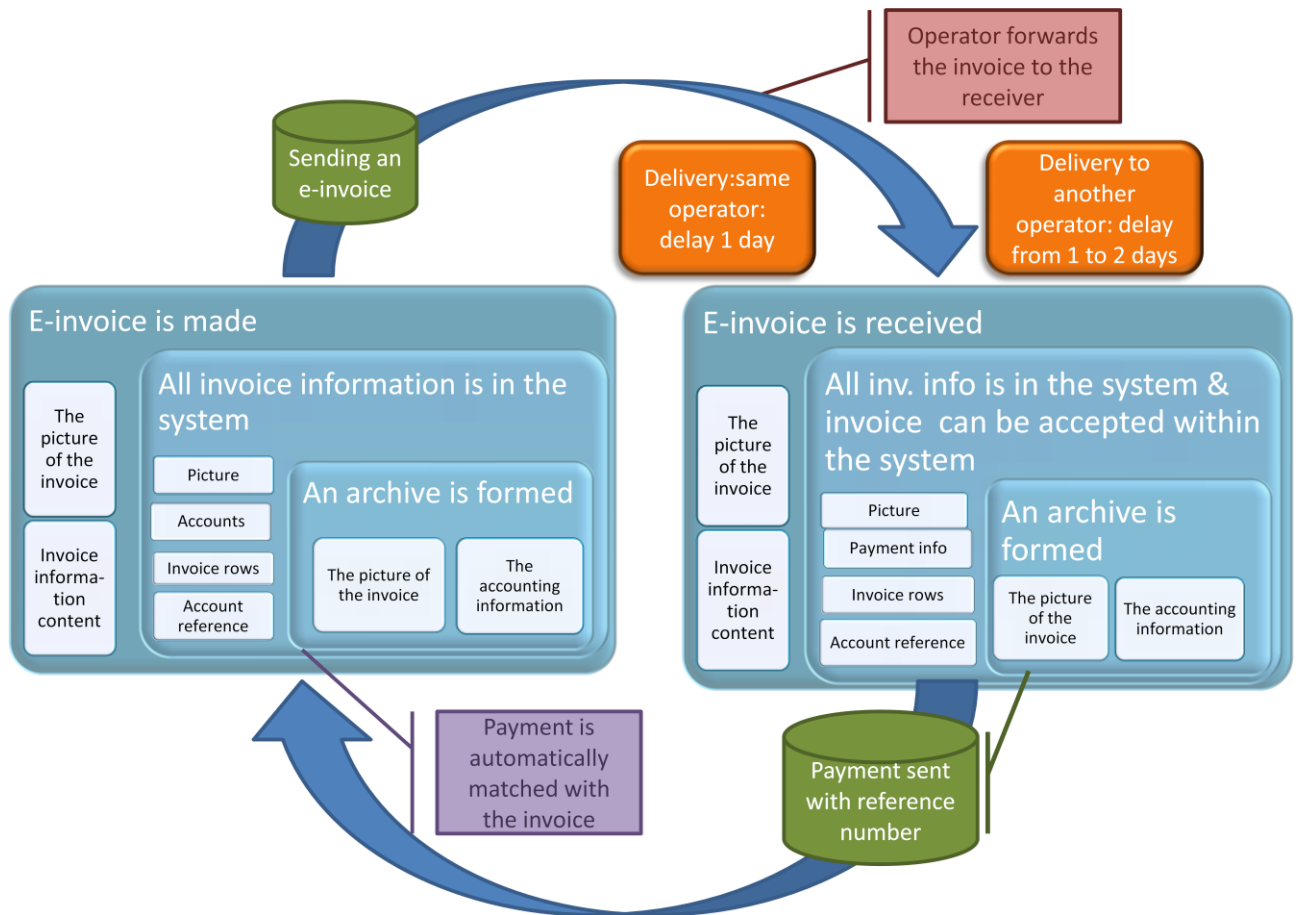
Sähköinen tiliöintiviite on tarkoitus pilotoida erikseen valittavien yritysten ja viranomaisten kanssa keväällä 2010. Pilotoinneista saamme arvokasta tietoa sähköisen tiliöintiviitteen toimivuudesta ja konseptin kehitystarpeista.

7.5 Appendix 5: Comparison of digital and paper invoicing processes



Picture 1: An example of the paper invoicing process

The information in the paper invoice is entered into a system on behalf of the supplier. Then all this information printed on paper and sent to the customer. At the customer’s side the invoice is taken out of the envelope and then taken to the acceptor for checking. When this phase is done, the invoice can be taken back to invoice the processors. After that, the same information is entered into the customers system again creating a significant waste of time. Even if these invoices were to be scanned at the customers’ side it requires manual work. For large companies the supplier sending paper invoices are also difficult, because the cycle of invoice processing takes such a long time before the invoice reaches the acceptor and can be checked for payment. In the worst case scenario, the information content of the invoice (supplier information, payment information etc.) is not stored in any information system, but is entered over and over again for new invoices. The end result of the paper invoicing process is also a paper archive, which according to Finnish legislation has to be kept for 6 years.



Picture 2: An example of the digital invoicing process

In this more ecological model, the invoice is not printed on paper and all information travels in electronic form to the recipients system. When the invoice arrives into the system, it can right from that moment automatically be in the accounting as well as in the archive. The payments too can be automated. This process model is also very easy to combine into an electronic order processing system. Accepting invoices is also much more simple and efficient, when the invoices can be checked in a system instead of going through a pile of papers. The archive of old invoices is also easier to access as you do not have to go to a physical storage to find a paper invoice but instead you can open it through a system from your desk as well. The digital system is also better in terms of transparency as all changes leave a trace in the systems unlike changes made to paper invoices.



## 7.6 Appendix 6: Definitions

An institution:

To define an institution, this thesis quotes articles by Burns and Scapens (2000) and Scapens (1994, p. 305-306). As Scapens (1994) states, there is no single, agreed definition for an institution, but in each case it needs to be defined, to enable the analysis of achieved results. Both before mentioned articles have used a definition originated 1932 by Walton Hamilton:” A way of thought or action of some prevalence and permanence, which is embedded in the habits of a group or the customs of people” (Hamilton, 1932 p. 84) It means that institutionalisation can happen when people continue routines for so long that they become natural, widespread and finally taken-for-granted methods for doing things. (Scapens, 1994; Burns and Scapens 2000, p. 5; Ribeiro and Scapens, 2006, p. 94–111)

FIA:

FIA-hanke (Fully Integrated Accounting) on osa Tiedon ja Helsingin kauppakorkeakoulun yhdessä käynnistämää Tekes-rahoitteista Real-Time Economy -ohjelmaa, jossa ovat mukana Aditro, Elinkeinoelämän Keskusliitto, Suomen Pankki, Tiece, valtiovarainministeriö sekä useita pankkeja ja järjestelmätoimittajia.

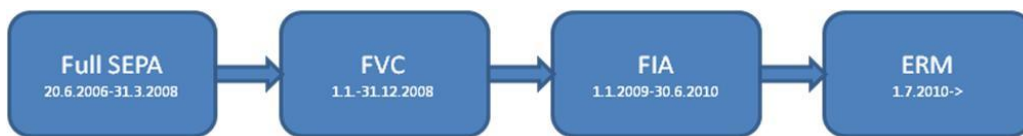
FIA-hankkeen myötä jatkuu eteneminen kohti reaaliaikaista taloutta, prosesseja ja palveluita. Hanke keskittyy erityisesti sähköisten taloushallinnon prosessien kehittämiseen ottaen huomioon arkistoinnin, tilintarkastuksen ja verotuksen asettamat vaatimukset. Yksi hankkeen tavoitteista on mallintaa uudenlainen tilikoodisto, jossa lähtökohtana on visio tulevaisuuden integroidusta taloushallinnosta.

Tiedon lisäksi hankkeessa on mukana tilitoimistoja edustava Taloushallintoliitto, Aditro sekä useita pk-yrityksiä. Hankkeeseen liittyvästä tutkimuksesta vastaa Helsingin kauppakorkeakoulu. FIA-hanke päättyy kesäkuussa 2010. (<http://www.tieto.fi/default.asp?path=408,415,40247>)

Real Time-Economy:

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 the business angle and IT-processing. For enterprises, public sector, and citizens this means, for example, that orders, order confirmations, invoices, and payments flow from system to system without delays. This makes it possible to move towards electronic archiving, electronic book-keeping, and automated accounting. The benefits for society at large are enormous - both in terms of productivity and environment. The RTE program is a joint project between Tieto and Helsinki School of Economics. The four steps in the RTE program are depicted below (SEPA = Single Euro Payment Area; FVC = Full Value Chain; FIA = Fully Integrated Accounting; ERM = Enterprise Risk Mitigation).



[http://www.hse.fi/EN/research/t/p\\_7/RTE/](http://www.hse.fi/EN/research/t/p_7/RTE/)

e-invoice:

An invoice sent in digital form like for example: Finvoice, TEAPPSXML or eInvoice.

Digital accounting:

Accounting based on digital vouchers like sent and received e-invoices and other electronic material. Purpose of the digitalisation is the minimisation of manual work in the accounting process and maximising the benefits of automation and utilisation of information systems.

Diffusion:

Diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system. Diffusion is a special type of communication concerned with the spread of messages that are new ideas. (Rogers, 1983, p. 34-35) In this thesis it is emphasized that the term diffusion is used to mean a situation where the innovation has actually been adopted or taken into use not just that people are aware of the idea in question. This definition is important to make due to the fact that a correct picture of the situation can be formed. The diffusion of the ABC innovation is an example where reading different studies can render different pictures on the phase of the diffusion. (Bjørnenak, 1997, p. 7) An innovation for the purposes of this research is described as anything new to the organization in question. (Bjørnenak, 1997, p. 4)