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Operators' Value Creation Models in Electronic Invoicing-User Company Perspective

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ABSTRACT

Electronic Invoicing (E-invoicing) has been going through fast development during recent years. It is believed to bring great savings for companies. There has been a lot of research and studies on E-invoicing. This study is going to study on how E-invoicing operators could create value but from users' perspective.

The study is going to build its own value creation framework based on Amit and Zott's value creation model in E-business, which defines four value creation dimensions, i.e., efficiency, complementarity, lock-in and novelty. First, extensive literature reviews on value creation theories, including value chain, transaction cost economy, resource-based view of firms and network economy, were conducted. Besides, enterprise application integration and expert opinion were also taken into consideration. As a result, the new value creation framework came out with four modified value drivers, namely efficiency, complementary services, integration and network effects. The changes were made because it is more suitable in the context of E-invoicing. Furthermore, for each of the value drivers, a set of measurement items were identified to evaluate how an E-invoicing operator performed in providing the service.

In the empirical part, two case studies are completed. Interviews were prepared and done with E-invoicing managers inside the company. It turns out that all the four value creation sources, efficiency, complementary services, integration and network effects, are observed in the company. As users of E-invoicing, the companies thought E-invoicing improves efficiency by reducing the invoice cycle time, saving costs, and eliminating human touch in the process. Supplier activation is seen as an important area where operators could improve their services. Integration of systems especially automatic accounting is regarded as the future development of E-invoicing but not yet under development in practice. Standardization is needed to enable E-invoice usage between different operators and networks.

This study is important in providing a new perspective on E-invoicing research and development. It not only contributes to the E-invoicing literature but also could act as guidance for E-invoicing operators on how to improve their services. It has limitations such as on the resources of information and future research areas are identified. For example, quantified research methods could be used to measure how important each value drive is.

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1 INTRODUTION

Electronic invoicing (E-invoicing) has become an increasingly popular and interesting topic recently both in academia and practice. E-invoicing is an emerging field of business in a rapidly developing area with enormous potential. With the recent development in information technology, E-invoicing has changed the way how business is conducted. Business efficiencies and environmental ecosystem are believed to be improved by E-invoicing. As stated in a report by EBA and Innopay (2010), it is estimated that over 200 billion euros are saved across Europe and E-invoicing is keeping growing. More and more users are adopting E-invoicing. Reported growth rates in the B2B segment is 40% in 2009, and the B2C segment also shows significant growth, with a 22% growth in the same year.

There has been a lot of research on why and how businesses should switch to E-invoicing. E-invoicing is believed to be beneficial to business in a lot of ways including environmentally friendly, time saving, cost effective, fast, error proof and so on. One percent more adaptation of E-invoicing would reduce the consumption of 800,000 trees in Europe annually (EBA and Innopay, 2008). Penttinen (2008) pointed out that E-invoicing will shorten the handling time of invoices because it eliminates the need for manual opening of mail, registering the invoices by hand, floor circulation of invoices in envelops, as well as scanning and controlling for right content. Besides that, errors will be reduced significantly duo to real-time tracking, status notification and instant delivery of E-invoicing.

The service provider market in E-invoicing has also been seen growth during the recent years. E-invoicing (2010) pointed out that the overall number of service providers in the E-invoicing market has grown from 160 in 2006 to 400 in 2009. It is estimated that the market would continue to grow but might embrace major consolidation as well. The business of service providers in the E-invoicing market ranges from exchange and conversion services, which are mainly focused on creation of an exchange network, to complete sourcing of accounts payable or accounts receivable management services. The essence of existing of service providers is adding value to invoice senders and/or invoice receivers. Various players have different market shares of e-invoice and it is believed that critical mass for E-invoicing service providers is around 1.4 million invoices per annum. The total revenues generated by service providers in this market are estimated to exceed 1 billion euros

annually. Therefore, there is a huge market there and it is worth studying how the service providers create value.

1.1 Objective of the Study and Research Question

Although E-invoicing has been talked about for years and an amount of research has been done around this area, there has been little discussion on how operators in E-invoicing market create value. Adopting from the users' point of view, this thesis is going to study how operators in Finland could create value when providing services. This study is very important because operators in E-invoicing market play critical roles in speeding up the adoption of E-invoicing among companies. Examining where the value could come from for E-invoicing operators would help them to see the huge potential in this market so that they are willing to take the initiatives in promoting E-invoicing.

The thesis is different from previous research in that it takes a different angle as from the users' perspective, to see how the operators should provide their services or improve their offerings. It is a complementary study to the Master Thesis of Haussila (2008) from Helsinki School of Economics and a paper by Penttinen and Salgaro's study (2008) titled *How do electronic invoicing operators create value*, both of which examined the value creation sources of E-invoicing operators through case studies.

This study will build its own research model based on the Amit and Zott's value model in E-business. Amit and Zott identified four value creation sources in their research model, that is, efficiency, complementary, lock-in, and novelty. It is a general model for E-business, but when applied in the specific context, E-invoicing, there might be modification for the model. So this thesis is going to explore if those four sources are applicable in E-invoicing and furthermore to see what are the other potential value creation sources for E-invoicing operators. In developing its own model, this thesis will further identify operationalized-level measurements for each of the four dimensions originated from Amit and Zott's original model. It is therefore also a further research of Amit and Zott's work.

So the research questions of this study would be: How could electronic invoicing operators create value in Finland, understanding it from the users' point of view? In answering the research question,

this study starts with Amit and Zott's business model for value creation in E-business and also examines if the model is applicable in E-invoicing. It tries to see if all the four dimensions are visible in E-invoicing context? This study also takes a further step to think about if there are any other value creation sources for E-invoicing operators besides the four dimensions identified in Amit and Zott's model and what would be the operationalized-level measurements for those dimensions?

1.2 Scope of the work

Multiple case studies will be used in this study. By in-depth interviews with managers who are responsible for handling invoices in several companies from Finland, this study aims to examine how the users think of E-invoicing services they have been receiving. The cases will mainly focus on incoming invoices because that is where the most benefits of E-invoicing are expected to evolve (Penttinen, 2008). However whenever the informants' knowledge is available, outgoing E-invoicing will be discussed as well during the interview but will not be a focus of analysis.

Although invoicing activities happen both in B2B and B2C areas and E-invoicing has been seen growing in both dimensions, this thesis will rely its analysis on B2B context. B2C E-invoicing is left out of scope of this research as the interviewees we chose are company users. The data we collect from case companies might be more convincing when used in B2B context. And this B2B context is even limited in Finland because case companies are from Finland.

In addition, this study aims to explore the value creation sources of operators from users' point of view. So the result might be different from the views of operators themselves. Opinions from the operators' side are not included in this study. Moreover, big companies are chosen as case representatives and conclusions are driven through interviews with management level employees from those companies. They might have different perceptions from small and medium sized companies regarding what they need from the E-invoicing operators. As a result, the conclusions drawn from this study might need to be used carefully when applied to small and medium sized companies.

There are also limitations to the representativeness of the study's findings because of the nature of case study research. Six companies are chosen for interviews and two of them are used for pilot study when modifying the research model. The other four companies are interviewed for testing the value creation model built for this study based on previous literature, research model and empirical evidence from selected companies. The results of this study are intended for exploratory and analytical usage but not for statistical generalizations. Due to limited number of case companies, extrapolating the findings on a large number of companies may not be scientifically correct.

1.3 Structure of the thesis

The thesis will unfold as follows: in the Second chapter, literatures and previous research on value creation and Amit and Zott's model will be reviewed. And in the Third Chapter, E-invoicing and operators in Finland will be introduced. Continuing from that, the Fourth Chapter illustrates how the revised model is developed and operationalized measurements are then generated. Next in the Fifth Chapter, the research method is introduced. Then in Chapter Six, the empirical studies are presented with two case companies. The research method and company interviews as well as findings and results are explained. At the end of this study, in Chapter Seven, discussions and conclusions on theoretical contribution, managerial implication and further research areas are uncovered.

2 LITERATURE REVIEW

Value creation is the primary goal of companies. The question of how to create values for customers and shareholders has always been the top business concern and also a hot research topic. In E-business, the technology resulted in new forms of business that were not previously practical of possible (Eikebrokk and Olsen, 2007) and therefore new values could be created from the way the transactions are enabled. This paper adapts Amit and Zott's value creation model in E-business, which identified four interdependent divers as the sources of value creation, namely: efficiency, complementarities lock-in, and novelty. Amit and Zott's model is grounded in the rich data obtained from case study analysis and in the received theory in entrepreneurship and strategic management and it provides an integrative perspective to explore the value creation sources. Amit and Zott's research draws on the extensive literature on value chains, Schumpeterian innovation, the resourced-based view of the firm, inter-firm strategic networks, and transaction costs economics (Raphael, 2001). It is built in the e-business context and therefore is applicable for electronic invoicing.

2.1 Value Creation Theories

There are a bunch of value creation theories studying how the values are being created. In this theory part, four value creation theories are introduced as follows: value chain analysis, transaction cost economics, strategic networks and resource-based view of the firm.

2.1.1 Value Chain Analysis

Porter's (1984) value chain framework analyzes value creation from the angel of a firm. This framework studies the activities of the firm and their economic implications. In order to identify the

value of business, four steps are defined in the analysis process: defining the strategic business unit; identifying critical activities; defining products; and determining the value of an activity (Amit and Zott, 2001). Value chain framework addressed questions on what activities should a firm perform and how, as well as configuration of the firm's activities. In Porter's model, companies' activities were divided into primary activities and support activities. The following figure shows what the composition of the two categories is and where the value creation could come from.

Figure 2.1: Porter's Value Chain
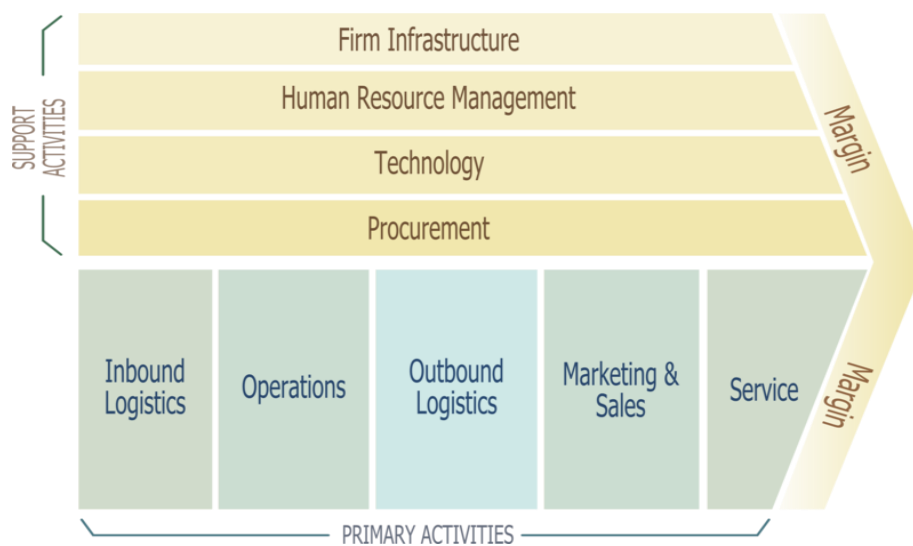
Source: Porter, 1984, *Competitive Advantage: Creating and sustaining superior Performance*

According to Porter, value was defined as 'the amount buyers are willing to pay for what a firm provides them'. So the problem of value creation could be tackled through differentiation along every step of the value chain (Amit and Zott, 2001). Firms need to think about what activities to perform and how, how to link within the value chain, when to perform the activities, where to provide products and services. Besides, questions such as how to share resources and activities among business units, how to develop learning ability in a firm, how to integrate different parts should also be addressed. The sources of value creation lie in the answers of the above questions. For example, policy choices, linkages, timing, and location, sharing of activities among business units, learning, integration, scale and institutional factors are identified value creation sources by

Porter (Porter, 1984, pp.124-127). In the new economy, Information technology is also regarded as helpful in creating value by supporting differentiation strategies.

2.1.2 Transaction Cost Economics

Transaction cost economics solve the problem why firms internalize transactions instead of conducting them in markets. Williamson (1974, 1979, 1983) developed the main theoretical framework by suggesting that 'a transaction occurs when a good or service is transferred across a technologically separable interface. One stage of processing or assembly activity terminates, and another begins' (Williamson, 1983, p.104). Transaction inefficiency may arise due to a number of reasons including bounded rationality, uncertainty and complexity, asymmetric information, and opportunism. Then with the aim of improving efficiency, transaction cost theory explains the choice of the most efficient governance form given a transaction that is embedded in a specific economic context. (Klein et al., 1978; Williamson, 1979). There are identified factors influencing these choices: uncertainty, exchange frequency, and the specificity of assets enabling the exchange.

Regarding the source of value creation, transaction efficiency is a major source based on transaction cost economics, because enhanced efficiency reduces costs. With the emergence of internet and other technology innovation, transaction costs are reduced (Dyer, 1997). Therefore, transaction cost economics could be an important approach in understanding value creation in e-business.

Transaction costs include direct costs and indirect costs. Direct costs are costs arising from the transaction itself such as 'the time spent by managers and employees searching for customers and suppliers, communicating with counterparts in other companies regarding transaction detail, the costs of travel, physical space for meetings, and processing paper documents,' as well as the costs of production and inventory management (Reiley and Spulber, 2001). Indirect costs are usually invisible but may influence a firm's profitability, for example, the costs of adverse selection, moral hazard, and hold-up.

2.1.3 Strategic Networks

Traditionally, industrial economies are characterized by competition among a few large firms dominating the industry and hence the idea of scale economies was adopted by strategic thinking. However, in the new economies dominated by knowledge and information, network economies have become vitally important for strategic action and success (Shapiro and Varian, 1999).

Strategic networks are 'stable inter-organizational ties which are strategically important to participating firms' (Gulati, Nohria, and Zaheer, 2000, p.203). As Meyer and Rowan (1977) and Oliver (1991) stated, densely interconnected ties among actors facilitate the diffusion of norms across the network constituted by those ties. Walker, et al., (1997) also pointed out that if all firms in an industry had relationships with each other, inter-firm information flows would lead quickly to established norms of cooperation; and in such a dense network, information on deviant behavior would be readily disseminated and the behavior sanctioned.

Strategic networks may have forms various forms determined by both parties with business concerns, including strategic alliances, joint ventures, and long-term buyer-supplier partnerships. The strategic network theories try to answer those questions of why, what and how. For example, why and how are strategic networks of firms formed? What is the set of inter-firm relationships that allows firms to compete in the marketplace? How is value created in networks? And how do firms' differential positions and relationships in networks affect their performance?

In information economy, the incentive for companies to link with each other could be credited to the rapid change of technology. In order to be successful, a firm needs to be unique and it would be more efficient to achieve this goal by cooperating with other firms with complimentary expertise, valuable information flows, and novel technological developments.

Network theories evolve over the time. Traditionally, network theory focused on the implications of network structure for value creation. Important determinants of network advantages, such as access, timing, and referral benefits have been identified (Burt, 1992). Moreover, as important as the determinants mentioned above, the size of the network and the heterogeneity of its ties also positively affect the availability of valuable information to the participants within that network (Granovetter, 1973). Nowadays, because firms with hierarchical governance mechanisms are also

connected in a market, new value creation sources have been identified, such as trust (e.g., Lorenzoni and Lipparine, 1999), the importance of resources and capabilities (e.g., Gulati, 1999), especially those of suppliers and customers (Afuah, 2000). Other sources of value in strategic networks include shortened time to market (Kogut, 2000), enhanced transaction efficiency, reduced asymmetries of information, and improved coordination between the firms involved in an alliance (Gulati et al., 2000).

In today's networked economy, there are several vital concepts and issues waiting to be resolved. Network externalities, network compatibility and common standard are the main three among a bunch of others.

Positive network externalities are considered to be beneficial to the success of a network. Theories also named positive network externalities as positive feedback, which makes the strong get stronger and the weak get weaker, leading to extreme outcomes. The fundamental value proposition arising from this is that bigger networks are more valuable to users than smaller ones. And as a result, a bigger network attracts more people connecting to it. This phenomenon has been observed not just in the new economy but also in the traditional businesses such as transportation and communications industries. A typical example observed is that the telephone companies have been expanding their networks reach by building up more stations.

The issue of compatibility always comes together with the positive feedback. Firms have to decide whether to be compatible or not in addition to strive for possibly most positive feedback. Shapiro et al. (1999) illustrated a Figure explaining the positive relationship between popularity and value as shown in the figure below.

Figure 2.2: Popularity Adds Value in a Network Industry
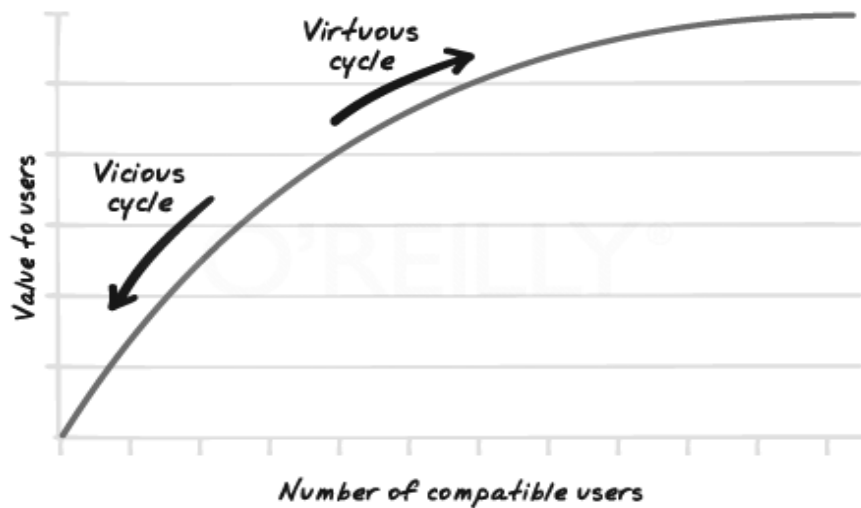
From the figure above, in a virtuous cycle, the popular product with many compatible users becomes more and more valuable to each user as it attracts ever more users. On the other hand, when the product is not compatible with others, a vicious cycle will appear. This trend could be easily seen in information industries.

Common standards play an important role in the network economy. Standards enhance compatibility, generating greater value for users by making the network larger. Moreover, standards reduce the technology risk faced by consumers. Lowering the risk of technology would increase the willingness of consumers to adopt a new technology. In contrast, with incompatible products, consumers' confusion and fear of stranding may delay adoption (Shapiro et al., 1999, p.230). Thirdly, standards reduce consumer lock-in. If the standards are truly open, consumers do not need to worry about their lock-in to a specific supplier and they can count on future competition. The reduced concern also helps consumers to adopt a new technology.

The importance of setting up standards cannot be stressed more, especially in today's service economy. As mentioned above, consumers generally welcome standards because most of the benefits of having an industry-wide standard go to consumers: they do not have to face the risk of picking up a wrong service provider whose standard turns out not to be the winner; they can enjoy the greatest network externalities in a single network or in networks that seamlessly interconnect; and they are far less likely to become locked into a single vendor.

2.1.4 Resource-based View of the Firm

The resource-based view (RBV) of the firm treats the firm as a combination of resources and capabilities. Resources are tradable and non-specific to the firm, while capabilities are firm specific and are used to engage the resources within the firm, such as implicit processes to transfer knowledge within the firm (Makadok, 2001, pp.388-389; Hoopes, Madsen and Walker, 2003, p.890). Penrose (1949) indicated that one source of value creation is uniquely combining a set of complementary and specialized resources and capabilities.

The fundamental principle of the RBV is that the basis for a competitive advantage of a firm lies primarily in the application of the bundle of valuable resources at the firm's disposal (Wernerfelt, 1984, p.172; Rumelt, 1984, pp.447-448; Penrose, 1949). When these resources are heterogeneous in nature and not perfectly mobile, a sustained competitive advantage could be transformed from the short-run competitive advantage (Peteraf, 1993, p.180). The following figure shows the resource-based view over time.

Figure 2.3: Resource-based View Over Time
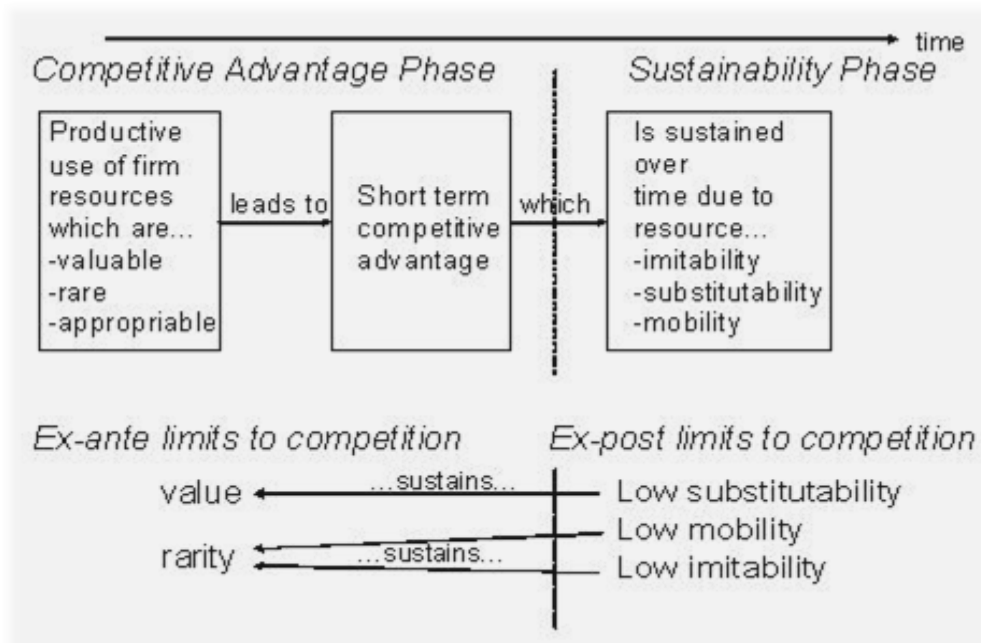
Source: Wade and Hulland, 2004

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RBV literatures could be traced back to earlier research where emphasis is put on the importance of resources and its implications for firm performance. Wernerfelt (1984) then influenced this body of research in his article named *A Resource-Based View of the Firm* and started the later concepts in this area. For example, Barney (1984) stated that RBV literatures have often been dealing with the questions of value appropriation and sustainability of competitive advantage. Later on, it extended into the dynamic capabilities approach, exploring how valuable resource positions are built and acquired over time.

In the even recent years, new sources of value creation have opened up with the appearance of virtual market. With technology updates, firms could create more value through relational capabilities and complementing resources. However, at the same time RBV theory has also been challenged because of increased value migration and reduced sustainability of newly created value. In addition, the networked economy makes it easier for rivals to access substitute resources and hence it adds more challenges to value creation for a firm.

2.2 Enterprise Application Integration

"*Enterprise Application Integration (EAI) is an integration framework composed of a collection of technologies and services which form a middleware to enable integration of systems and applications across the enterprise*" (Wikipedia, 2011).

Information systems have been in place in enterprises for years. Research regarding how to make the best use of those systems has been conducted and discussed. In addition, various applications scatter in different business process inside a company. For example, there are supply chain management applications which manage inventory and shipping for companies, customer relationship management applications for managing current and potential customers, business intelligence applications for finding patterns from existing data from operations, and all other types of applications. However, the problem is that those applications are isolated and they are not connected with one another so that data or business rules are not shared among them. As a result, redundant data is scattered in multiple systems inside one company and human work is needed to transfer the data from one system to another which means processes cannot be automated. This causes inefficiencies for a company.

Obviously, there is a business need to integrate all those applications. Driven by the need to improve efficiency and thanks to the development of technology, Enterprise application integration (EAI) was brought out to consolidate once disparate systems to form a more comprehensive Information System (IS) infrastructure. With EAI, a company's applications are linked together and as a result business processes are simplified and automated to the greatest extent possible. EAI is the "unrestricted sharing of data and business processes among any connected application or data sources in the enterprise." (Gable, 2002).

EAI has its advantages and disadvantages. It improves organizational efficiency, maintains information integrity across multiple systems and makes ease of development and maintenance of data by providing real time information access among systems and reducing human touch of business processes. However, EAI also requires high initial development costs, especially for small and mid-sized businesses (SMBs) and a fair amount of preliminary business design, which deters many managers because they are not able to envision or they are not willing to invest in.

There is a debate about the types of Information Systems that can be integrated through EAI. Grimson et al. (2000) thought that EAI is limited to the integration of ERP systems, while Duke et al. (1999) suggested that EAI also supports the incorporation of all packaged applications. More broadly, Ruh et al. (2000) reported that EAI does not only link together packaged systems but also intra-organizational IS and Zahavi (2000) argued that EAI supports both enterprise and cross-enterprise application integration. Irani et al. (2003) then proposed a taxonomy shown in Figure 2 that enables managers and solution-developers to understand the scope and impact of application integration.

Figure 2.4: Taxonomy for Enterprise Application Integration
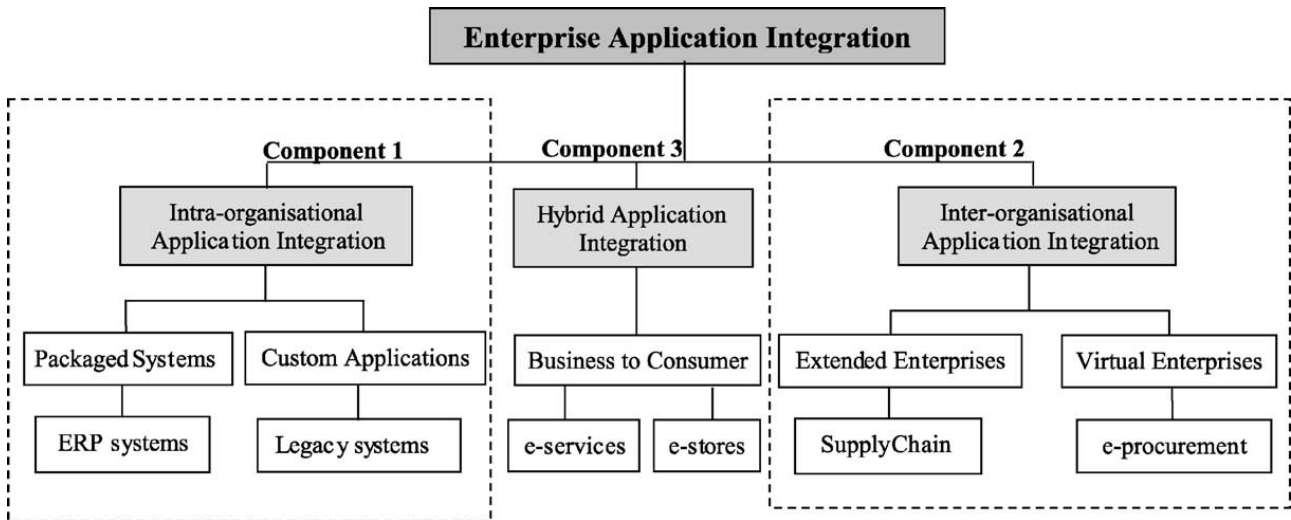
Source: Irani et al., 2003, The impact of enterprise application integration on information system lifecycles. *Information & Management*

2.3 Amit and Zott's Business Model

Amit and Zott (2001) examined the value creation sources in e-business by studying how fifty nine American and European e-businesses create value and identified four interdependent value creation dimensions: efficiency, complementarities, lock-in, and novelty. The value-drivers model was grounded in the rich data obtained from case study analysis and in the received theory in entrepreneurship and strategic management. Figure 1 below shows the four dimensions in this e-business value creation model.

Figure 2.5: Sources of Value Creation in E-business
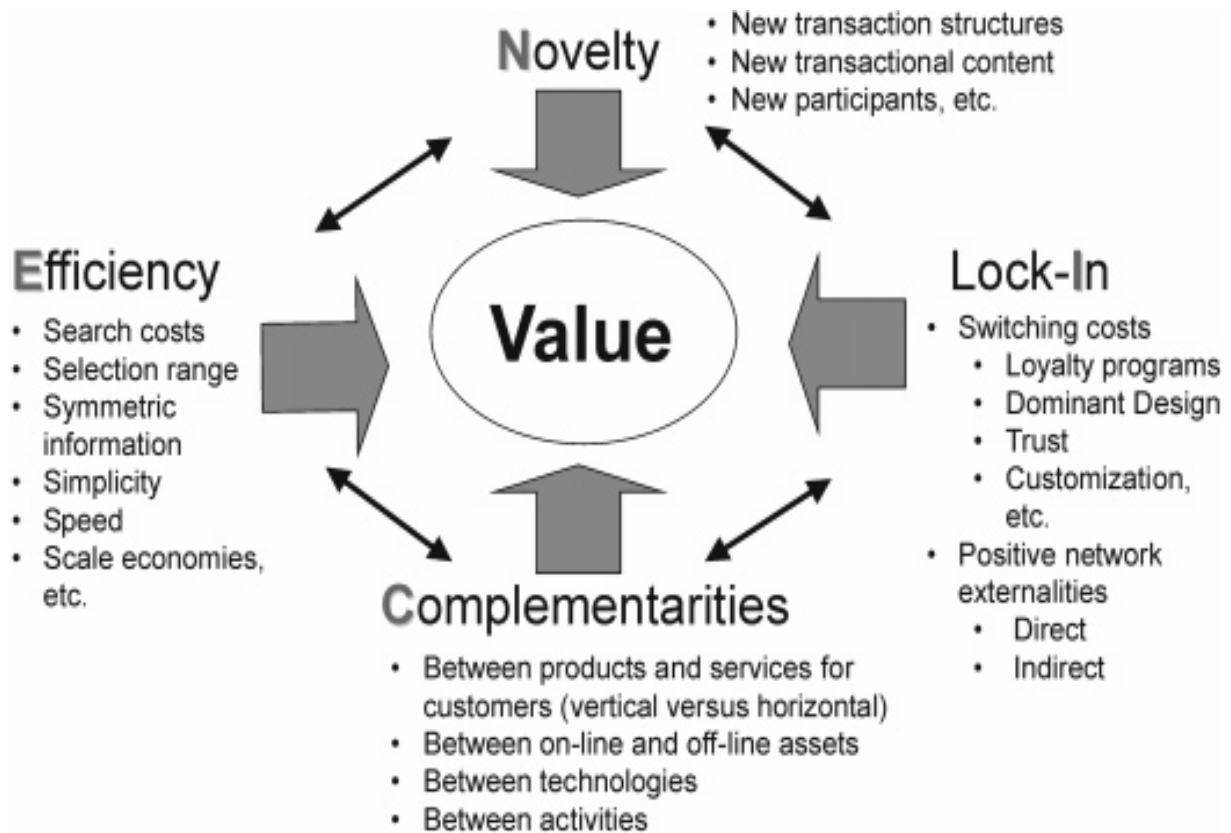
Source: R. Amit and C. Zott , 2001

As is seen in Figure 2.4, the four sources of value, namely Efficiency, Complementarities, lock-in and Novelty are linked together. For each of them, the following part will elaborate what it is.

2.3.1 Efficiency

Efficiency might be one of the primary value drivers for e-business. Williamson's (1974, 1983,1989) transaction cost theory is consistent with this finding. Efficiency means how quickly a transaction could be done and it could be improved through many ways including reducing search costs, narrowing down selection range, avoiding asymmetric information between buyers and sellers, simplifying and speeding up transaction process and enlarging the network. E-business makes it

easier to achieve. Improved information can reduce customers' search and bargaining costs (Reiley et al., 2001), as well as opportunistic behavior (Williamson, 1974). With the supply of up-to-date and comprehensive information, both buyers and suppliers know what the market situation is so that they would make more rational decisions. With internet connection, the information could be transmitted faster and more conveniently. Also the comprehensive information system reduces distribution costs, streamlines inventory management, and simplifies transactions. Hence, individual customers benefit from scale economies.

2.3.2 Complementarities

Complementarities exist when a bundle of goods are provided together and they create more value than the total value of having each of the goods separately. Brandenburger and Nalebuff (1996) stated that a complementor could be identified if customers value your product more when they have the other player's product than when they have your product alone. Complementarities could be one source of value creation because it enables revenue increases. In e-business, this potential for value creation is leveraged with providing bundles of complementary products and services to customers. There are vertical complementarities (e.g., after-sales services) which could be accomplished by one company and horizontal complementarities (e.g., one-stop shopping, or cameras and films) that are provided by partner firms. Moreover, these goods or services could be directly related to a core transaction enabled by the firm or indirectly to attract more customers.

Complementarities can evolve in various forms. It exists between products and services for customers, between on-line and off-line transactions, between business activities and between technologies. Those above aspects could all be the sources of value creation related to complementarities.

2.3.3 Lock-in

Lock-in is present when it is expensive for customers to switch from one brand of technology to another (Shapiro et al., 1999, p.104). For the business firms, lock-in then enhances the value-creating potential by increasing transaction volumes. In order to prevent customers from migrating to competitors, the company might need to create lock-in by increasing switching costs.

There are several strategies suggested by literature regarding switching costs, i.e., loyalty programs, dominant design, trust, customization, and etc. Loyalty programs have the ability to turn conventional markets into lock-in markets. Loyalty programs (Varian, 1999) can be established by rewarding repeat customers with special bonuses. According to Shapiro et al. (1999), the key to such programs is that the reward to past loyalty must be available only to customers who remain loyal. Firms can also develop dominant design proprietary standards (Teece, 1987) for business processes, products, and services. Being the first mover in the market is critical in attracting new customers while developing dominant design proprietary standards is crucial in retaining those customers, because technology learning is a huge part of switching costs for customers. Furthermore, firms can establish trustful relationships with customers. From Shapiro and Varian, one needs to create entrenchment in order to establish lock-in. The goal is to structure the relationship with customers to simultaneously offer them value and induce them to become more and more committed to your products, your technology, or your services (Shapiro et al., 1999, p.146). One way would be offering customers more value-added informational services. Another way would be to ensure the transaction safety and reliability to customers. Finally, customization could be used as a way to increase switching costs because customers have to learn to get familiar with the interface design of a website or a technology. In order not to learn again, customers are reluctant to switch to other website of technology. In this way, companies inhabit customers from switching to competitors.

Besides the factors stated above, network externalities play an important role in locking in customers. There are both direct network externalities and indirect network externalities. When the value created for customers increase with the size of the customer base, it is direct network externalities. Companies can create direct network externalities by establishing a community for customers, which provides a platform for customer to interact with each other. Indirect network externalities arise when economic agents benefit from the existence of a positive feedback loop with another group of agents (Amit and Zott, 2001). Katz and Shapiro (1984) give the term of 'hardware-software paradigm' to indirect network externalities and stated that it could be attributed to the

complementary nature of some of the major components of the network in which an e-business firm is embedded (Economides, 1996).

2.3.4 Novelty

The theory of novelty has been explored long time ago. Schumpeter (1934) articulated the value creation of innovations, which traditionally could be done through introduction of new products or services, new methods of production, distribution, or marketing, or the tapping of new markets.

With the emergence of virtual market, innovation could also be achieved by changing the ways businesses are done. In e-business, companies create value by connecting previously unconnected parties, eliminating inefficiencies in the buying and selling processes through adopting innovative transaction methods, capturing latent consumer needs, and/or by creating entirely new markets (Amit and Zott, 2001).

Virtual markets make more possibilities for innovation because it removes geographical and physical constraints, facilitates the information flows from customers to vendors and equips novel information bundling and channeling techniques. In addition, e-business firms have the chance to select appropriate participating parties.

Companies can do a lot with novelty in the form like how transactions are structured, what new contents could be added as well as who else could be involved in the business chain.

2.3.4 Interdependence of the four dimensions

As stated in Figure 1, the four sources of value creation are interdependent. Efficiency improvement makes complementarities possible because information technology paves the way for the exploitation of complementarities in e-business. On the other hand, complementarities bring

convenience to customers. Complementarities reduce searching costs for customers when they make their decisions. From the customer's point of view, efficiency is enhanced.

Efficiency and complementarities can be helpful in provoking lock-in. If a business has the feature of efficiency and complementarities, it could attract and retain customers and partners. It is true vise versa, when an e-business company creates lock-in, it has positive effects on efficiency and on the degree to which it provides for complementarities. Taking on-line auction businesses as an example, the lock-in effect is created by enlarging the network, which contains more buyers and sellers. This strong potential for lock-in provides an incentive for high-profile partners to contribute complementary products and services because of the high volume of transactions.

Novelty is also linked with complementarities. Providing complementary service or products could be one way of innovation. Innovation relies on the company's complementary elements, such as the resources and capabilities they combine (e.g., Schumpeter, 1934; Penrose, 1949; Moran and Ghoshal, 1999).

Novelty and efficiency are walking hand by hand in the context of virtual markets. Introducing novel assets may sometimes bring efficiency to e-businesses. The on-line auction business could be used as the example again. Through maintaining and expanding a data base of transactions provided to its customers, it increases transaction efficiency by reducing the asymmetry of information between the buyers and sellers. At the same time, it is quite an innovative service because it enables participants to benchmark current transactions against historic sales to reduce market failures.

2.4 Summary of Literature Reviews

Those literatures above review the value creation logic for companies. With value chain analysis, transaction cost economy, strategic network and resource-based economy as well as the Amit and Zott's model, the conceptual framework was developed by Penttinen and Salgaro (2008), which adapted the model into E-invoicing. This framework could be seen in the following figure.

Figure 2.6: Conceptual Framework of Value Creation

Novelty
- participation in national/international public discussion
- new services
- technological innovation

Efficiency
- transaction cost per invoice
- initial investment in technology
- network width

Value

Lock-In
- customization
- community pricing
- progressive pricing
- duration of contracts

Complementarities
- complementary services (scanning and mailing services)
- delivery of other trade process documents
- invoice handling systems
- non electronic invoicing related services

Source: Penttinen and Salgaro, 2008, How do electronic invoicing operators create value?

This model is going to be tested from the users' side. The aim is to find out if all those four sources stated above are observed from the users' point of view and more importantly some extra value creation sources and operationalized measurements are expected to be found out.

3 ELECTRONIC INVOICING AND OPERATORS IN FINLAND

This Chapter will first look at E-invoicing in general. Then it will focus on Finnish market by dealing with two aspects of E-invoicing in Finland. Section 3.2 will talk about how E-invoicing was started in Finland and what is the present situation. Section 3.3 will then introduce the Finnish E-invoicing operators.

3.1 E-Invoicing in general

It was stated at the beginning of this study that E-invoicing has seen a remarkable increase during recent years. However, despite the increase of E-invoicing market and business needs of implementing e-invoicing, e-invoice penetration rates and adoption rates remain relatively low due to an amount of hinders and obstacles in implementing e-invoicing. It is estimated that the overall penetration rates are still below 10% and the E-invoicing adoption rate is 4-14% in Europe (EBA and Innopay, 2008). The major barriers to the adoption of E-invoicing are identified in E-invoicing (2010) as follows:

- It is not easy to convince the enterprises into supply chain automation, both large and small.
- E-invoicing is supported by European legislation, but the legal framework still needs greater clarity and harmonization.
- A stand of content of E-invoice is needed.
- Interoperability and reach is a big issue in spreading E-invoicing.

Regarding how business could migrate to E-invoicing, promotion and cooperation are needed for initiating the process. The European Commission has also set up an Expert Group with a mandate to create a framework supporting cross-border and interoperable e-invoicing within the EU. In 2009, this Group published its final report which recommended actions such as legal and business requirements, interoperability requirements, standards and proposals for implementation. Many efforts should be put into aspects such as harmonization of legal framework, satisfying the needs of SMEs, creation of an E-invoicing eco-system and common content of invoices.

3.2 E-invoicing in Finland

E-invoicing has been used in Finland for more than 30 years. It is estimated that in Finland, the yearly volume of invoices is about 440 million, of which 240 million are to consumers and 200 million among businesses. Roughly 20-30% of the B2B invoices are electronic invoices.

Finland is the leading country in using E-banking. Starting from that initiative, Finland took a further step to E-invoicing. At the beginning, Finnish banks designed a machine readable form of invoice to replace the paper invoice. As a result, Finvoice (short for financial invoice) were then innovated and launched in mid-2003. It drove the use of E-invoicing usage in Finland. In June 2007, about 70,000 companies use Finvoice. 2010 was a good growth year for e-invoicing using the Finvoice standard in Finland with 71% growth. However international standard is still needed and the development process is pretty slow.

Early in 2002, a co-operation network called E-Invoicing Forum was founded to provide a collaboration and meeting platform for different players in E-invoicing including E-invoicing operators, IT developers, Suppliers and buyers as well as experts. Its main objective is to introduce E-invoicing and promote the adoption and use of E-invoicing. It encourages and facilitates cooperation among forum members in all aspects of implementing E-invoicing ranging from common standard development to technical and software usage. However, Finland still faces problems and challenges in driving the penetration rates of E-invoicing. Consumer E-invoicing and SMEs are the two main problem areas.

Though Finland is already one of the international leaders in business-to-business E-invoicing, it still lags behind in consumer E-invoicing. According to a survey done by Itella in 2008, the leading country in both consumer and business E-invoicing is Denmark. Finland has the technology infrastructure to switch to E-invoicing in B2C sector by just replicating the successful adoption practice in B2B sector. The reason of slow adoption then lies on the consuming behavior of Finnish people, according to the survey. It seems that Finnish people think being able to pay their bills on line is quite enough because on-line banking is quite common used in payments for individuals. The other reason could be the lack of efforts in motiving consumers to switch to E-invoicing. One solution could be by charging a certain fee using paper invoice. According to a Finnish Survey done

in 2001[1], 47% consumers said they would consider switching to E-invoicing if the fee is going to be charged.

At the same time, Finland is making its efforts to resolve the problems above by taking an initiative role from the top government. In the SME sector, the Federation of Finnish Financial Service is keen on promoting structured E-invoices among them.

The Finnish public sector has set the deadline for receiving paper invoices to the end of the year 2009, after which all the invoices sent to the Finnish government have to be in electronic format. In early 2010, Finland required all the state agencies and institutions to receive only E-invoicing from their suppliers. The State Treasury of Finland is leading the way in E-invoicing adoption and uptake. It reached an agreement with Basware to offer companies that do not yet have an E-invocing capability a free service of sending their invoices to the State. It is important that suppliers, no matter they are large or small, are all on the board of E-invoicing. The government's efforts in promoting and making E-invoicing accessible and usable to even small businesses could be seen from this action. It sets quite a good example to other governments as well.

3.3 E-invoicing operators in Finland

The Finnish E-invoicing operators market is divided mainly into two segments: financial operators and non-financial operators. Financial operators include traditional financial institutions like banks and non-financial operators evolve from different industries from technology companies to logistics service provider. Service provider names are such as Itella (ex Post Office operation), Basware, Logica, Anilinker and TietoEnator. They have also expanded outside of Finland with their global existence, especially in Germany.

Banks and E-invoicing operators are both providing services to business and public. The banks and e-invoicing service providers have agreed upon basic procedures that enable E-invoices to be sent and received reliably in a common trunk network. This means that the invoicing traffic between the invoice issuer and invoice recipient is conveyed in a uniform manner even if the parties use the

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[1] *Elkelä Kari, Sähköinen Kuluttajalaskutus Suomessa, 2001*

services of different e-invoicing service providers. The following figure from TIEKE shows us how many businesses are using Finnish service providers to send E-invoices.

Figure 3.1: Number of Business Using Finnish Service Providers
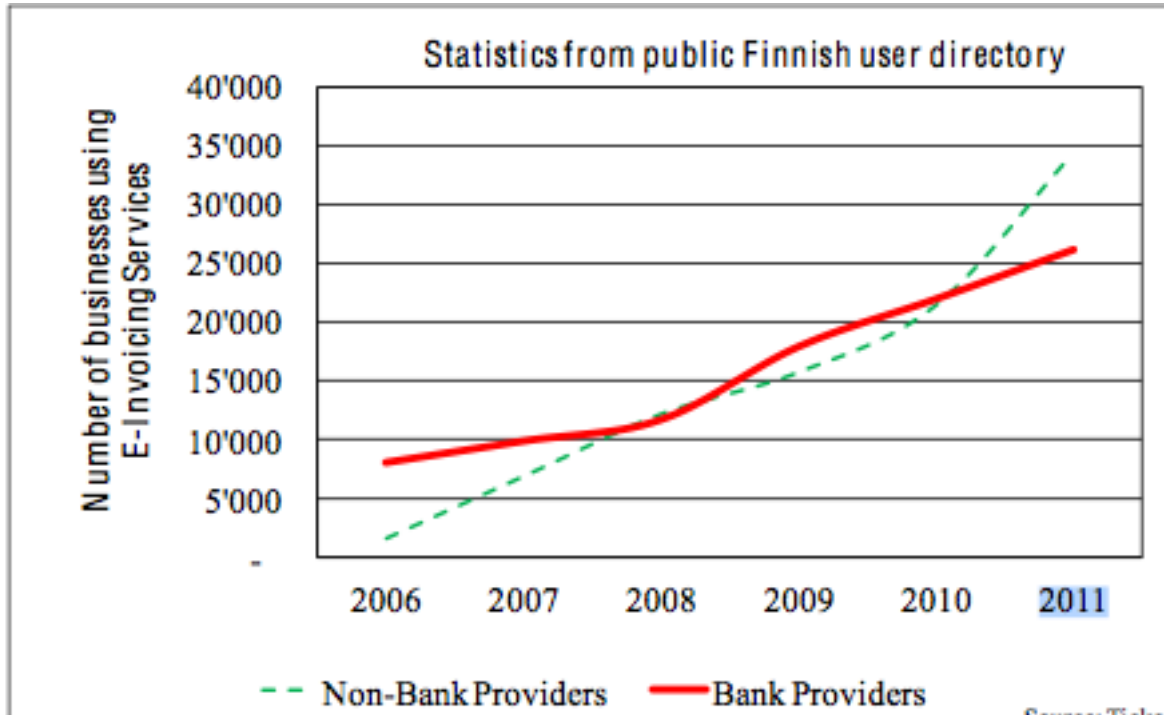
Source: TIEKE, 2012

The e-invoicing service providers and the banks take care of the set-up, maintenance, monitoring and backups for the network connections. They also handle any format conversions needed for eInvoices, allowing customers to select the method of sending and receiving eInvoices that suits them best.

The collective bank model is based on Finvoice which is an e-invoice for electronic/online presentment by the invoice issuer to the receiver. Finnish banks originally designed it as invoice in machine readable from (XML) enclosed in an electronic envelope to replace the traditional paper invoice. It is a solution suitable for invoicing between businesses of any size, also for invoicing to consumer customers.

In 2009 banks have 129,000 agreements with corporates for using Finvoice and the e-invoice volume in the banks' network has increased by 60%. Banks' e-invoice volume was over 8 million.

The market share information in Finland shows that each of the different players has their share of the market. It is estimated that operator-to-operator electronic invoices represent 44% of the market. Twenty-eight percent of the electronic invoices in Finland are from bank-to-operator invoices. Operator-to-bank invoices have a 17% market share, while bank-to-bank invoices represent 11% of the market in Finland (Koch, 2007). Processing cost savings are yearly around 2.8 billion Euros in Finland (Confederation of Finnish Industries, 2008). The following table illustrates the major player in the Finnish E-invoicing market as well as their market size and number of employees.

Figure 3.2: Finnish Operators and Their Market Value

Finland	Core business	Revenues	Personnel
Nordea	Banking		
OP	Banking		
Sampo	Banking		
Basware	Financial management	€ 73 million	650
Enfo	Information logistics, IT outsourcing, printing and scanning	€140 million	700
Itella	Information logistics, printing and scanning	€ 1.7 billion	25,000
Liaison Finland (Anilinker)	Information logistics	€ 4.6 million	30
Logica Finland (WM-data)	Information logistics	€ 270 million	2,800
TietoEnator	Information logistics, IT outsourcing, supply chain integration	€ 1.8 billion	16,000

Source: Penttinen, Salgaro, and Haussila, 2008, How do electronic invoicing operators create value?

4 BUILDING THE VALUE CREATION MODEL AND OPERATIONALIZED MEASURERS

In this chapter, the revised value creation model for E-invoicing operators is going to be proposed. It is done through three steps. Firstly, in section 4.1, the question why the Amit and Zott's business model should be examined again and modified specifically within E-invoicing context is answered. Then it is followed by demonstrating how the modification is done through comprehensive literature reviews and discussions with experts. As a result, the new value creation sources are identified, based on which the E-invoicing operator value creation model is built. In Section 4.2, the new model is elaborated in details of four value drivers, efficiency, complementary services, integration and network effects. Finally in section 4.3, operationalized measures regarding each of the four dimensions are discussed and formalized. And by then the complete model is presented.

4.1 Revisiting Amit and Zott's model

As stated in the introduction chapter, this study is going to build foundation on Amit and Zott's business model, which is so far the first attempt to combine different value creation theories, for example, the value chain framework, the resource-based view of the firm, the strategic network theory and transaction costs economics, into one single framework. However, the business model was proposed in the context of E-business and created through structured questionnaires with organizations doing B2C transactions. It will result in flaws when applied in the specific context of E-invoicing. So it makes sense to think about replacing some of the value creation sources or creating new dimensions.

When applying a research model into a new business context, the changes have to be considered. By using grounded theory development approach, Amit and Zott's contribute to the theory development in E-business, where firms use internet to do business. While E-invoicing is enabled by technology advancement, which is similar to E-business, but it distinguishes from the general E-business definition in the sense that E-invoicing is a business process of an enterprise.

Qualitative research methods taught us that theories serve as both input and outputs combined with data collection and analysis. Andersen (2009) proposed an approach for using existing theory in theory-building qualitative research called vivo approach, where the existing framework is gradually deepened, refined and complemented by confronting with the empirical world (Andersen, Borum, Kristensen, and Karnøe, 1992). The constant iterations between theory and data are vital to theory development. This is also in line with what Eisenhardt (1989) said data analysis is often hard to distinguish from data collection in inductive research. Hence, this research is inspired to take into consideration of empirical evidence and transform Amit and Zott's model into a revised one applied for E-invoicing.

Besides the value creation theories appearing in the literature review part, exploration for publications relevant to E-invoicing is implemented. The search sources are mainly published papers through Real Time Economy run by Aalto University School of Economics, academic books mainly by Penttinen regarding E-invoicing, digital research libraries (such as ScienceDirect and Aalto libraries), publications by organization with a purpose of promoting E-invoicing such as EBA and Innopay, operator's presentation, and internet. The searching keywords are E-invoicing, Value creation, business models. As a result of initial efforts, 40 articles and reports (excluding non-relevant ones) are found out and studied. Most of the reviewed papers have a relationship with E-invoicing or Electronic order-to-pay cycle.

After studying, it is found out that a numerous reports and studies all point out efficiency as the original and main driver for E-invoicing adoption. While those are complied with the value drivers from Amit & Zott's model, it is strikingly evident to me that phrases like automatic accounting, integration, inter-compatibility and industry standards occur frequently from those reviewed papers. Moreover, in Haussila's(2008) study of applying Amit & Zott's (2001) E-business model to E-invoicing, it highlights two components of the value sources: efficiency and complementarities.

Summarized from the findings, the two dimensions of value sources from Amit and Zott's model, i.e. efficiency and complementary service, are kept in this new research framework. In the contrast, lock in and innovation are not often observed or mentioned either in research or among practitioners. However, after a thorough study, I found out that technically lock in and innovation do exit but it is more appropriate to refer to them by saying network effects and integration in E-invoicing context, as those two are more commonly discussed in this field both by users and operators. Taking the

factor above into consideration, network effects and integration are used to replace lock in and innovation dimensions from Amit and Zott's model in the model of this study.

Until now, the modified research framework for operator value creation sources is established as shown in the following figure. The four dimensions are efficiency, complementary services, integration, and network effects. In the following part, each of the four dimensions will be elaborated in details.

Figure 4.1: E-Invoicing Operator Value Creation Model
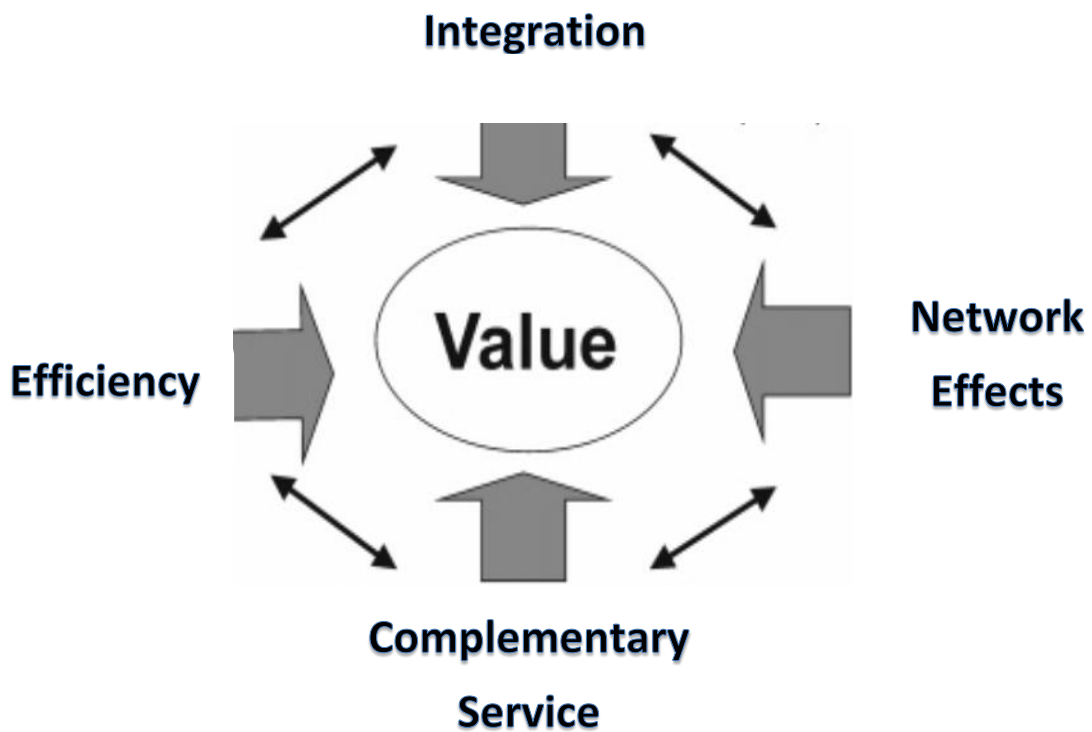
4.2 Structure of the model

By reflecting existing literatures and research as well as expert comments, a framework on how the operators create value in E-invoicing is proposed and the structure is as follows:

- Four categories or dimensions represent the value sources for E-invoicing operators. This is done in the previous part, as shown in Figure above.
- Each of these categories is operationalized by a set of items (or sub-categories) which outline the key activities the operators could take to create value for users regarding the specific value source. This is going to be finished in Section 4.3.

4.2.1 Efficiency

Efficiency resulting from adoption of E-invoicing has been widely recognized and well perceived from a lot of research and also actual users. A survey in 2011 reveals that 97% of businesses believe that effective use of E-invoicing would allow them to achieve operational efficiency.

A GXS White paper revealed the benefits of E-invoicing from both buyer's and seller's sides. The Figure below borrowed from that paper showed efficiency improvements in several types. With the scope of this thesis, benefits from the buyers' side will be analyzed mainly.

Figure 4.2: Benefits of Electronic Invoicing
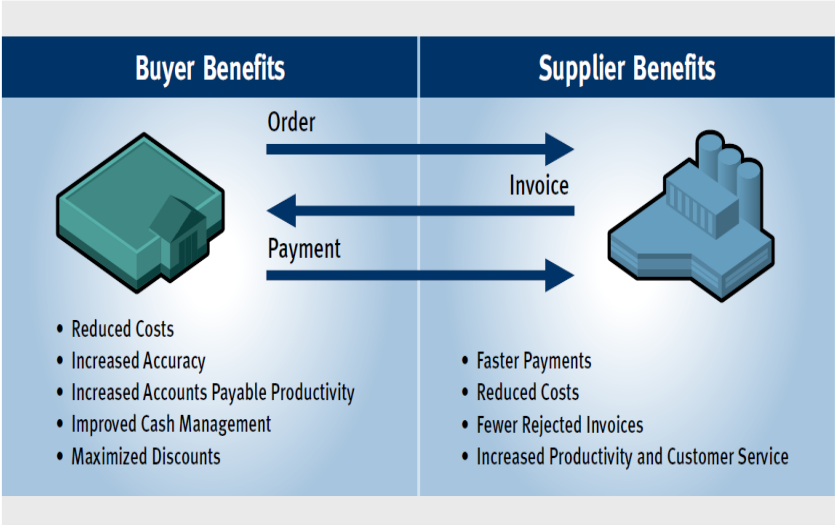
Source: A GXS White paper for the Active Business, 2010, Optimizing Your Accounting Process with Electronic Invoicing

As could be seen from the figure above, benefits of E-invoicing from the buyer's side are reduced costs, increased accuracy, increased accounts payable productivity, improved cash management and maximized discounts.

The motivation for companies switching to E-invoicing is mostly cost saving. Money is always the fundamental source when businesses make a decision, with no exception of E-invoicing. The question of how much cost could be saved by use of E-invoicing has been studied a lot in the past few years. Studies show that 30-60 percent of invoicing processing costs could be reduced because of the elimination of sorting, registering and manual data entry of invoices. The following table from a study presents the time saved by comparing E-invoicing with paper invoicing.

Figure 4.3: Productivity: Change in Work Time After Adopting Electronic Invoicing

	Time		Saved	
	Paper Invoice	Electronic Invoice	Min.	%
Outgoing	8 min 41 s	4 min	3 min 41 s	43.40%
Incoming	3 min	1 min 30 s	1 min 30 s	40.00%

It showed 40% time saving of incoming invoices through E-invoicing. Besides shortened time of processing, how much is that in terms of money? Penttinen (2008)'s research on a micro company gives us the idea on how much an incoming invoice costs handled by different processes, paper form, semi-automatic, automated process.

Figure 4.4: Receiving Invoices in a Micro Company
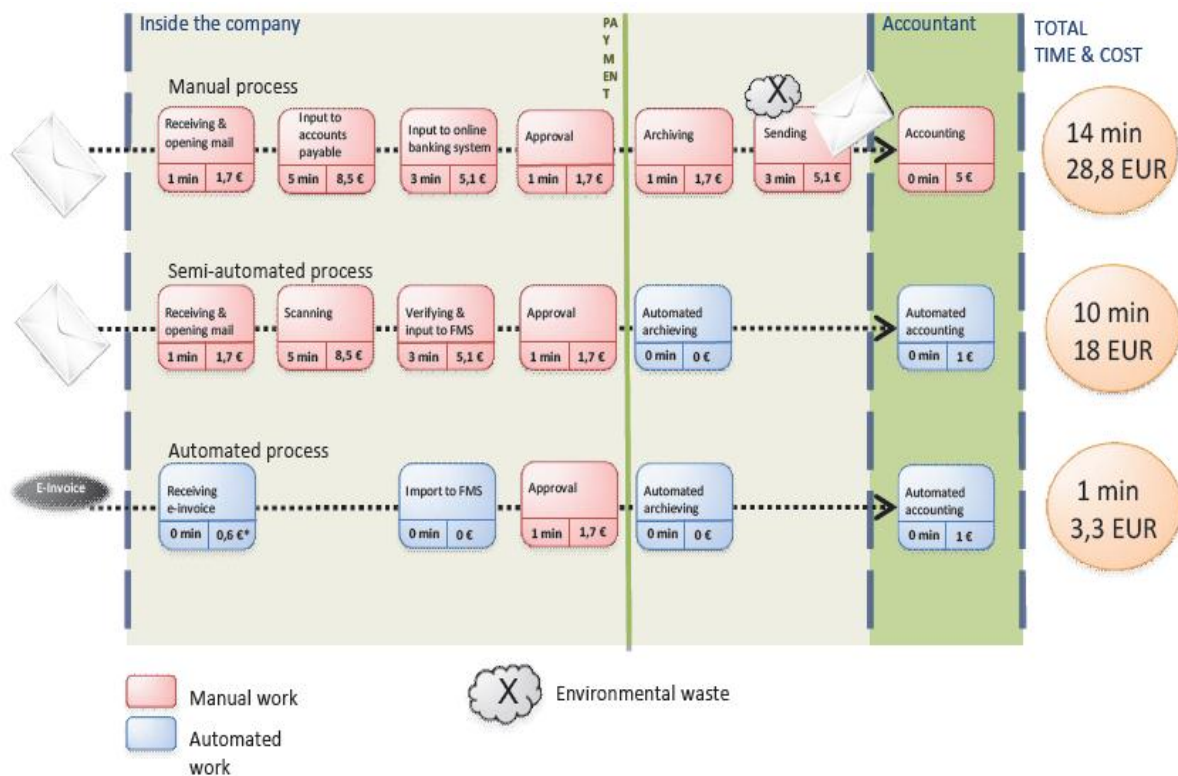
Source: Penttinen, 2008, Electronic Invoicing Initiatives in Finland and in the European Union

Specifically in Finland, Electronic Invoicing Initiatives in Finland (2008) identified a saving of about 30 Euros per invoice by transforming from Paper Invoicing to Automated Invoicing. The following table shows the result.

Figure 4.5: Cost Savings Potential Per Invoice

Level of Automation	Cost of sending an Invoice (€)	Cost of receiving an invoice (€)	Total cost (€)
Paper Invoicing	28.8	18.55	47.35
Semi-automated invoicing	18	11.1	29.1
Automated	3.3	10.8	14.1

Source: Electronic Invoicing Initiatives in Finland, 2008

You may be wondering where the savings come from. With a look at the handling process of an incoming invoice, you will understand the reason and appreciate E-invoice. A figure comparing the different process regarding invoice handling through paper form and electronic form is borrowed for explanation from the report of Federation of Finnish Financial Services (2010).

Figure 4.6: Incoming Invoice Handling Process
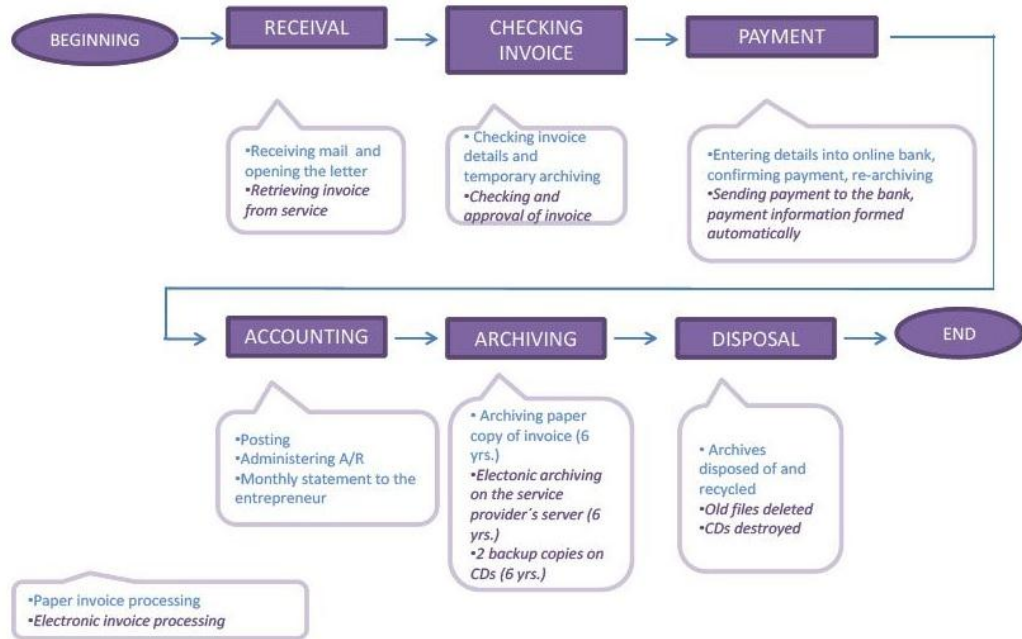
Source: Federation of Finnish Financial Services, 2010, Environmentally friendly

By applying E-invoicing, manual work is eliminated along the process, which saved a lot of time. Moreover, entry of invoice information is omitted by automatic matching within different information systems of a company. Electronic archiving and disposal are realized as a means of time and money saving.

Besides cost savings, information accuracy is improved as well, especially regarding the accounting information. Manual work is error prone, so with E-invoicing, financial information are directed into the accounts payable system without human touch and this information could be seen in real time by different departments to reach the goal of information sharing. Furthermore, because of the increased accuracy, Accounts Payable staff does not have to deal with dispute caused by wrong invoice information. Less bothering work and correction of manual mistakes will be reduced and instead more productive and meaningful work such as auditing and validating invoices or exploring opportunities for early payment discounts will be offered to employees. This will have a positive impact on employee's work attitude. At the end, the company will benefit from improved productivity of its workers.

Positive side effect is achieved as a result of improved efficiency inside the users' company. With faster and more accurate payments to suppliers, more strategic relationships will be easily set up between the two parties and in return the users will get better services.

4.2.2 Complementary Service

Complementarities are bundled services together with the core business offerings, which in the context of E-invoicing is to provide electronic invoice. Penttinen (2008) argued that operators tend to create more value by providing complementary services. A list of possible complementary services are also identified in the same paper, such as scanning and mailing services, delivery of other trade process documents, invoice handling systems and non-electronic invoicing related services. Besides the services mentioned above, other studies conducted in the companies of using of E-invoicing raise the attention of supplier activation or supplier engagement, which is frequently mentioned by users.

According to a global view research report released by Basware (2011), the challenges preventing most organizations from creating greater cost efficiencies are the inability to offer suppliers possibilities of doing transactions electronically and the multiple portals used by suppliers.

We all understand that E-invoicing is more a customer-driven initiative and suppliers typically play a more passive role. However, as stated in the network effects, the more players in the network, the more beneficial electronic invoicing is to users. For the users, the return of investment on E-invoicing will increase as more of their trading partners participate in E-invoicing. So for operators, helping suppliers to understand why their customers move to E-invoicing and see the benefits for both sides of E-invoicing will definitely increase their willingness and fasten their process of adapting to E-invoicing requirements.

Starting from this point, E-invoicing operators should consider offering the service of activating their users' suppliers. This is not only what is expected from users but also an important revenue sources for the operators. It is a win-win situation for both the users and operators. In some sense, the users are bringing potential customers for their operators so the operators should take the initiative to get more suppliers on-board, rather than the users themselves do the job.

Another common obstacle facing the suppliers is the lack of options when switching to E-invoicing. So it is the operators' job to provide a variety of options at different prices in order to get more trading partners involved without changing too much of their business processes. It is found out that Small and Medium-Sized Enterprises (SMEs) is more reluctant to switch to E-invoicing because usually it is too expensive for SMEs to implement such an E-invoicing solution. Cheaper solutions to SMEs should be available.

Example of different E-invoicing solutions could include Web-based forms, Accounting package integration and ERP System Integration. Web-Based Forms would be a good service package for SMEs because it is easy to use and simple to install with the minimum requirements of a Web browser and an Internet connection. Accounting Package Integration is for suppliers who use some accounting software package. They could create electronic invoices directly from their accounting package, without re-keying any data. ERP System Integration, on the other hand, is for larger suppliers. These services should enable suppliers to create electronic invoices directly from their ERP application. More conveniently, those created E-invoices will be sent directly to the customer's accounts payable application. Straight-through processing occurs on both buyers' and suppliers' side. Obviously it requires communications between both sides and possibility the operators of two sides. More details will be covered in the Integration part.

SMEs are an important sector and play a critical role in smoothening the E-invoicing way. Usually, they have low volumes of invoices received and sent, so the cost savings may be small for them. E-invoicing in this sense is not attractive to SMEs. What is more important, they do not want to invest a lot in the IT system. One solution the operators could provide is to join with the banking community in offering no IT investment and no IT skill for the SMEs. From practice, software-as-a-service (SaaS) is a suitable delivery model, which could help many smaller, and medium sized companies take the advantage of automation. With SaaS, companies access the software over the web on a pay-as-you-go basis, often determined by the volume of transactions. This is great for SMEs because they do not need to buy expensive software and deal with maintenance and upgrades.

Another compliance service could be the regulatory compliance services. As identified by some research, legislation issue is one of the barriers blocking E-invoicing from diffusion. With the adoption of E-invoicing, more and more countries are enacting legislation to regulate electronic invoicing. And in most of cases the specific regulations vary from country to country. So when

providing E-invoicing services, operator should take those regulations into account and offer compatible E-invoices so that users do not need to worry about legal issue.

Typically, regulations regarding E-invoices are Digital signatures, Archiving, and VAT compliance. In some countries like Spain, E-invoices are required to be digitally signed in order to guarantee their origin and integrity. Many countries have different requirements on the archival years of digital invoices. For instance, Germany requires data archiving for ten years and the UK requires six years. VAT compliance (Value-Added Tax) is a big concern for companies using E-invoicing and the rules in Europe vary country by country. So it is really important that the operators could provide the market intelligence about country-specific regulations on VAT issue.

Operators could also act as a consultant besides offering E-invoicing solutions to their clients. Because E-invoicing involves system changes and behavior change of people who are used to paper transactions, communication is vital in getting the E-invoicing through the organization. Communications to stakeholders should be enhanced. However, this is now neglected. According to the study of Salmony and Harald (2011) on E-invoicing in Europe, one of the reasons which slow down the adoption of E-invoicing is that some market player still consider E-invoicing not easy and not cost-effective enough. The change management consumes a lot of resources from the company. This then creates a perfect chance for operators to step in and provide appropriate services like training target company's employees on E-invoicing knowledge and how to use the new system if there is any.

E-Invoicing Service Providers should try to engage in the public policy debate and to suggest the best practices. E-invoicing is a new concept and it requires consolidated work of different parties in order to market E-invoicing and offer help. One suggestion from E-Invoicing/E-Billing (2012) is that association of E-Invoicing providers could gather together the expertise of Application Service Providers (ASP), consulting companies and other market participants and provide an information platform that supports interested companies with the planning and implementation of their E-billing projects.

The function of such an association also lies in smoothening the legitimate issues by offering solutions from their expertise. Since there are no clear international regulations and harmonized legal or administrative practices in place, it is then easy for such an organization of experts to exert influence on how the new legislation is made.

4.2.3 Integration

Summarized from the literatures and expert opinions, integration in E-invoicing presents itself in two forms, namely internal system integration and supply chain integration. Internal system integration refers to accounting automation. This is inspired by the narrow definition of E-invoicing, which is the pure exchange of electronic invoice. Without sending paper invoices anymore, enterprises communicate with each other electronically. Electronic invoice with purchase and payment information is transmitted through internet via services provided by banks or operators.

As often discussed in E-invoicing field, by transforming paper invoice to electronic invoice, a lot of benefits like time saving, less manual work, more accurate information as well as environmental goodness could be realized. However, most of the benefits are realized by "the integration and dematerialization of the order-payment cycle" which covers "the entire commercial, logistics, administrative and financial process from creation of the order up to the closure of the payment cycle and associated settlements."

Supply chain integration, hence, is taking the initiative of full integration and automation of the purchase-to-pay cycle. E-invoicing is not only about the receiving company, but also in close relation with the whole order-payment cycle. Then integration at this level is to make the entire process from creation of the order to the closure of the payment electronic and automatic.

Upon showing the connecting relationship between the two aspects of integration with E-invoicing, the following figure demonstrates E-invoicing both in a strict sense and broad sense.

Figure 4.7: Electronic Invoicing Process

Electronic invoicing in a 'strict sense'

Supplier

Banking System

Order | Delivery | Invoice | Payment

Customer

Electronic invoicing in a 'broad sense'
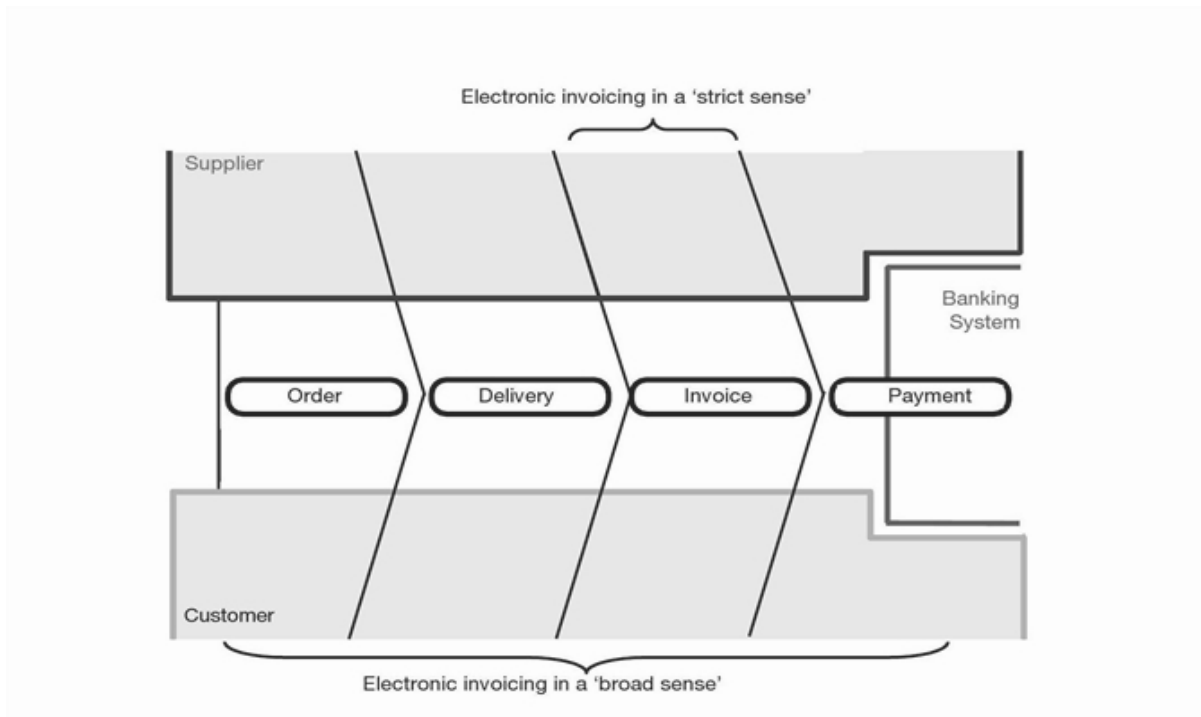
Source: Caluwaerts, 2010, Towards a European Electronic Invoicing Framework, *Journal of Payment Strategy & System*

As a matter of fact, the migration from strict E-invoicing to broad E-invoicing has been reflected in the real-time economy framework, which was established in European level. Starting from E-banking back in 1982, integration of more parts along the financial and business value chains range from ordering and invoicing to payments and accounting is sought out in the timeline. The following figure shows the evolution towards the real-time economy.

Figure 4.8: Evolution Towards the Real-time Economy
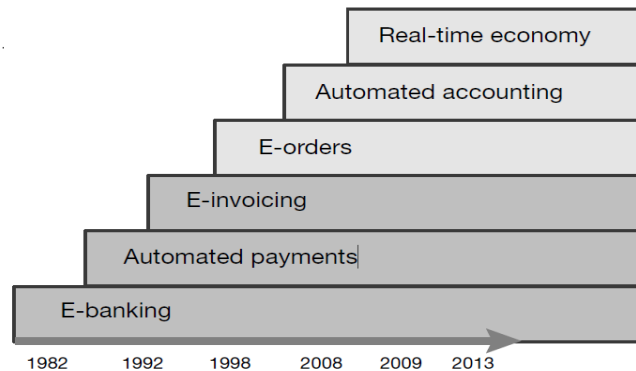
Source: Salmony and Herald, 2010, E-invoicing in Europe: Now and the future

In the following part, both internal and external integration through E-invoicing will be discussed. These two aspects of integration are connected with each other and could also be complementarities in bringing more value to enterprises. They are different just in the broadness of the concept. Internal System Integration refers system integration inside a company while Supply Chain Integration involves outside stakeholders along the value chain.

Internal System Integration could also be understood as automatic accounting. It makes sense to closely look at how an incoming invoice is handled inside a company in order to see the benefits of automatic accounting. First, the invoice arrives at the buyer organization. Then the accounts payable clerk must ensure that the document is indeed an invoice and forwards it to the responsible person for that particular invoice for content approval. Normally, this is the person who placed the order. The amount invoiced should be matched to the purchase order, if there is any. If it matches, the responsible person will have to approve the invoice by signing it off and after that the invoice could be posted into the accounting system. Of course, posting information such as general ledger account number, VAT code and project number and etc. is needed. And finally, the invoice can be put forward to payment.

With E-invoicing in place, the process could be simplified to a great extent. First the check and approval process could be done on line with the E-invoice entering into the company's accounting

system. Then the manual posting process is removed by implementing an electronic accounting reference (Penttinen, 2008). The following figure shows how the EAI could connect all the systems inside a company.

Figure 4.9: Hub and Spoke
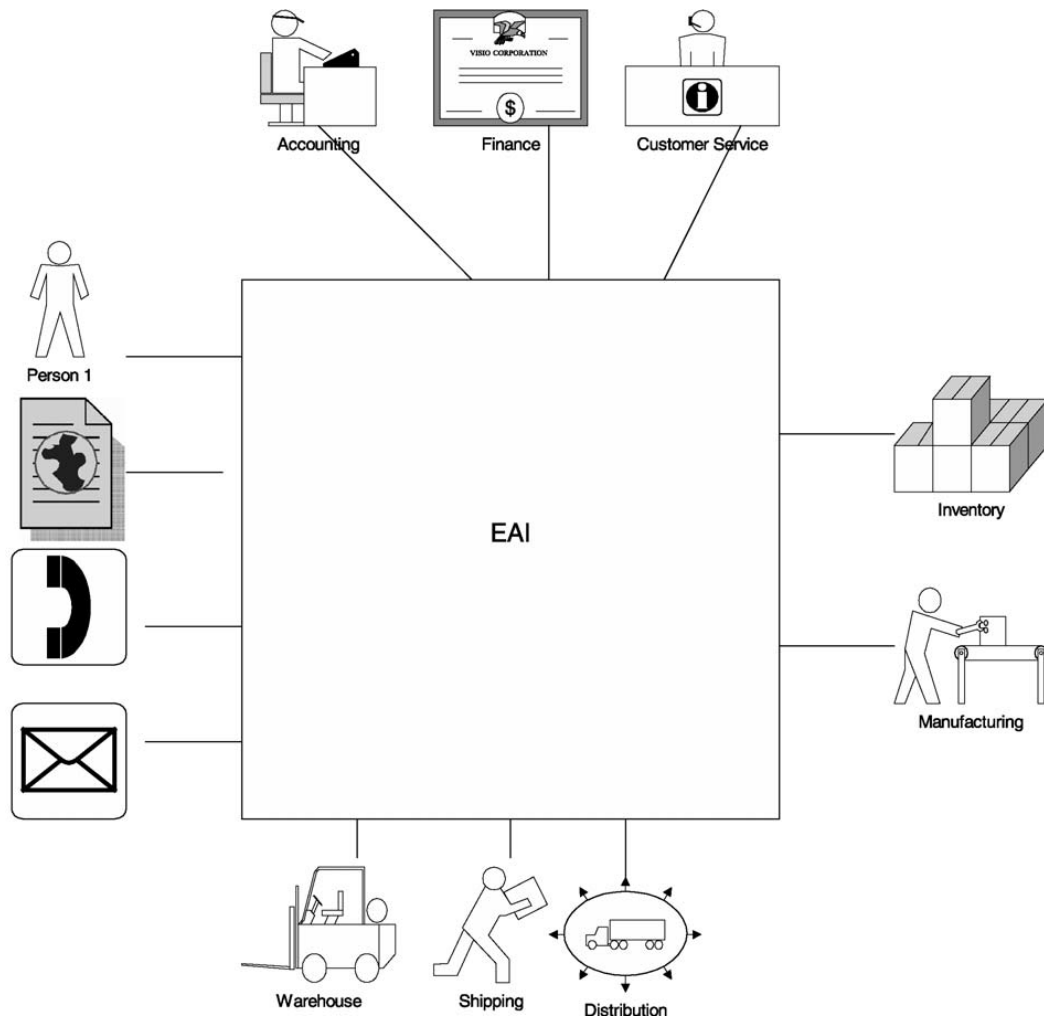
Source: Erasala et al., 2003, Enterprise Application Integration in the Electronic Commerce World

Besides the internal integration of systems, the same paper also defines integration by taking one business as a unit in the entire framework. Integration of systems between suppliers and buyers simplified the supply-demand process and also brought great potential savings to both suppliers and buyer. It is a complicated framework that integrates companies' different functional systems including ERP, CRM, Legacy Apps and SFA. The following figure gives us an idea what a B2B framework would look like in the Electronic Commerce World.

Figure 4.10: B2B Framework
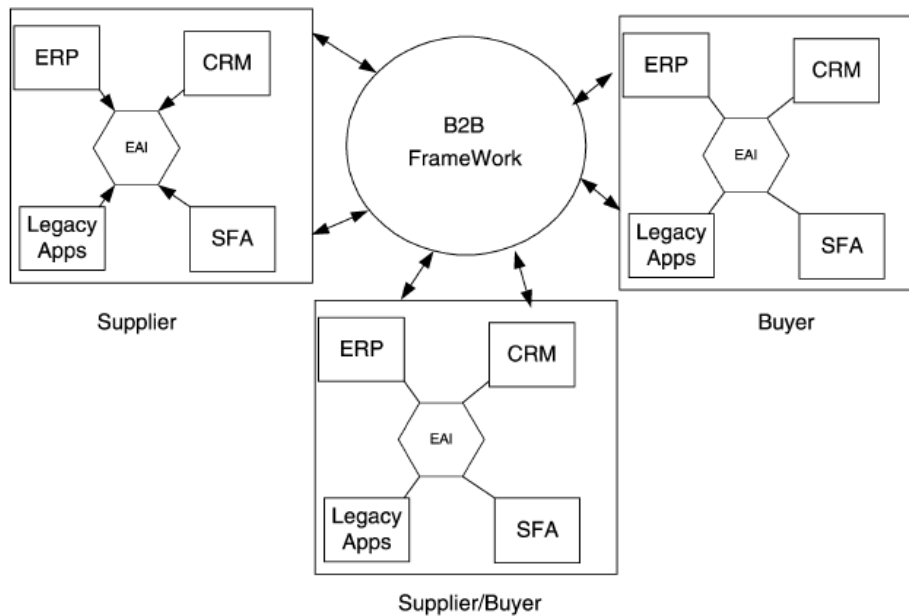
Source: Erasala, et al., 2003, Enterprise Application Integration in the Electronic Commerce World

Let's first look at the invoice cycle in business before evaluating supply chain integration. Invoice happens with the physical transaction occurring between a product or a service provider and a buyer or consumer. Typically the invoice sender is the supplier while the invoice receiver is the buyer. The invoice circulates through different departments in both companies. The invoice cycle is completed with continuous interaction between two parties. In order to present the cycle clearly, activities along the chain are separated and grouped into the sender and receiver sides.

On the sender's side, the invoice cycle is started by the creation of invoice. Then the invoice is sent to the receiver. At the same time, accounting procedure happens in the sender's financial system by booking an account receivable. Archiving and disposal are following the accounting process. On the other side, the receiver needs to approve it once the invoice arrives. Payment then could be made to the supplier. Same as on the sender's side, the receiver need to go through accounting, archiving and disposal of the same invoice as well.

Based on the explanations above, the following figure gives us an idea of how an invoice flows along the supply-demand chain from the beginning to the end. The Federation of Finnish Financial Service summarizes the invoice cycle by combining both sender and payer sides in one single figure.

Figure 4.11: Invoice Cycle
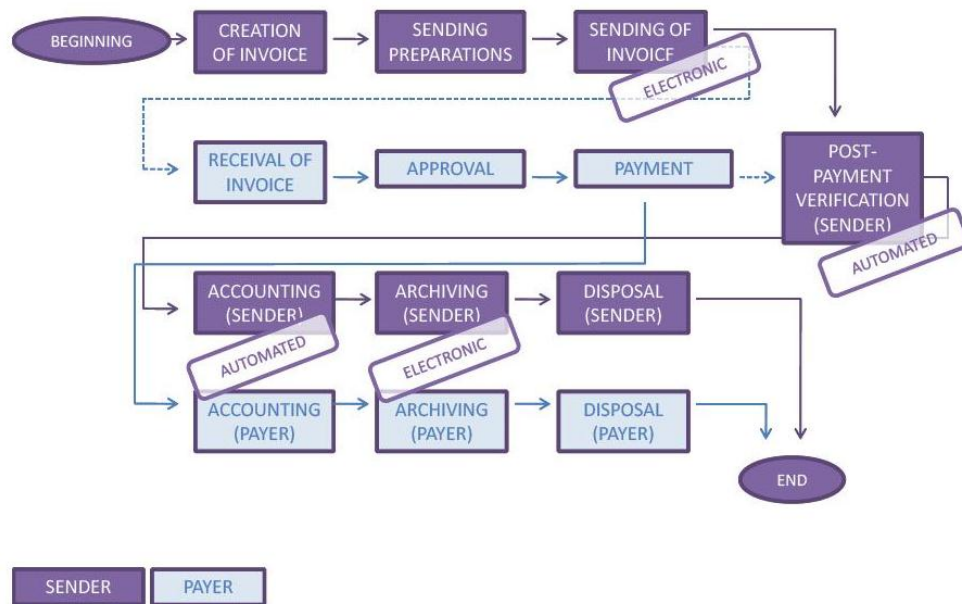
Source: Federation of Finnish Financial Services, 2010, environmentally friendly

We could find out that the process is quite long by linking different parties along the value chain. And it is without any doubts that manual work would cause a lot of mistakes and delays. But in an integrated network system, these problems will be resolved. Rama and Jones (2006) gave us an example in their paper *Integration of the supply chain through E-commerce* of how the process is streamlined. Purchase Order (PO) is sent to the supplier and at the same time sales order is created from the system. Then electronic invoice could be sent to the customer and a purchase invoice record is automatically added to the customer's purchasing system. Furthermore, inside the customer's enterprise system, the receiving invoice could be matched with payment system and invoice information could be automatically posted to account payable, which has been explained in

the previous part of internal system integration. With the visibility of information to every related department, late payment will be reduced greatly.

Taking the explained process into account, Lempinen (2009) developed a E-order, E-invoice and E-payment process map, which articulated how the invoice related activities are completed in different performing parties as well as how the process is connected among them. The table adapted from Lempinen's (2009) thesis is presented as follows.

Figure 4.12: E-order, E-invoice, E-payment Process
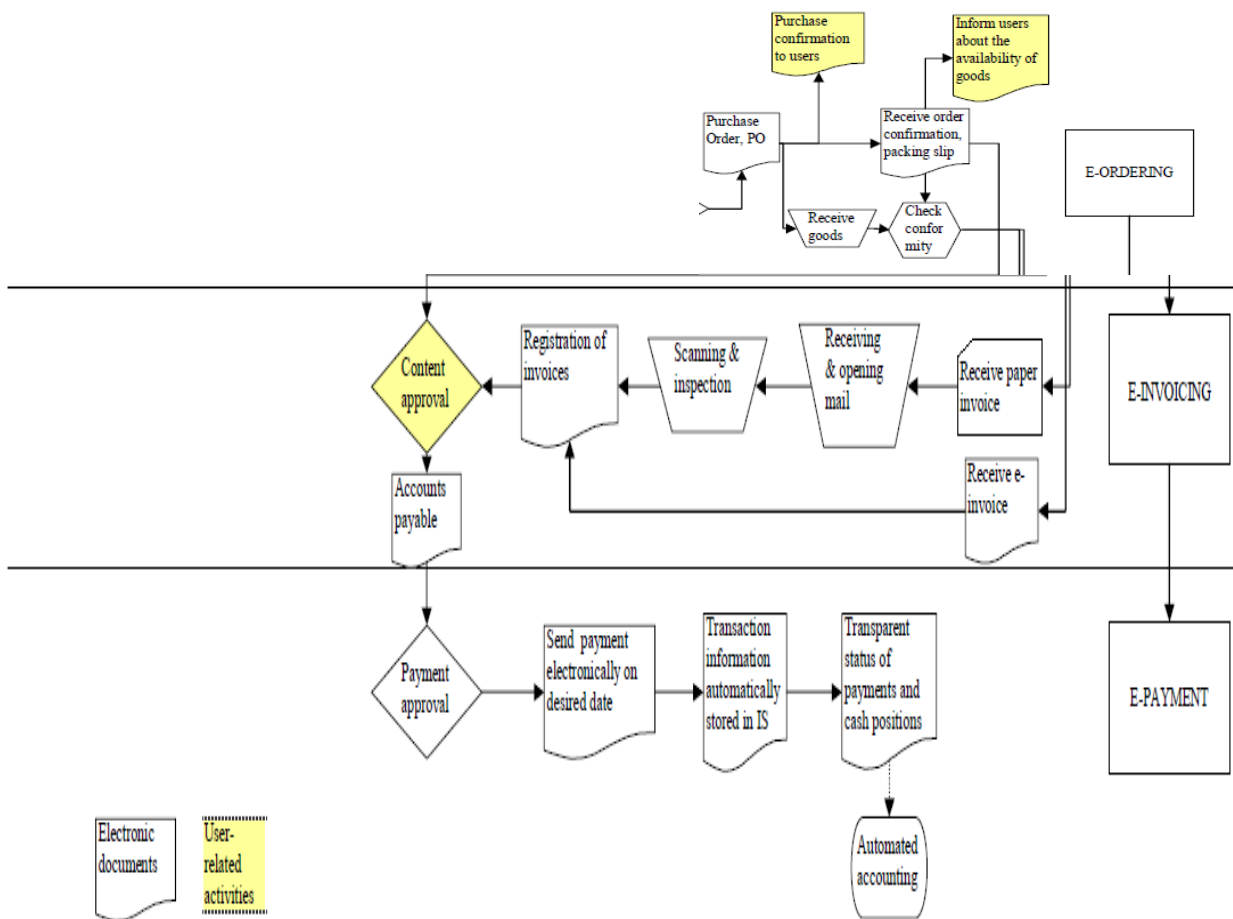
Source: Adapted from Lempinen (2009)

Another benefit related to integration is better cash management and supply chain financing. Resulting from a more efficient e-invoicing approval process, enterprises are enabled to take advantage of discounts for early payments. Thinking it further, this is just a first step towards increased efficiency. Some more value-added activities such as automated auditing, accounting and reconciliation, as well as improved risk management, could because company practices.

The automation of processes speeds up account settlement. Furthermore, automated processes reduce opportunities for human errors that can have serious customer, partner, or tax implications. The maintenance of electronic trade data in electronic formats can streamline business reporting, electronic filing, and compliance-related tasks. From the point of view of an overall enterprise, simplified business processes foster business innovation, enhance competitiveness and encourage market growth.

However there are challenges with Integration. There are problems with data format because the data sent to a business partner are not likely to be in the exact format needed for the partner's information system. That is why operators should work on standardizations as well. This will be explained in the next part.

4.2.4 Network Effects

In terms of network effects regarding E-invoicing, interoperability and common standards will be discussed in the following paragraphs. In common sense, when we think about network effects, lock-in and externalities would come to our mind. It is evident in previous literatures, which has also been illustrated in the literature review part. However, here in E-invoicing, interoperability and common standards are selected as the two factors in network effects because experts and users mostly see them as obstacles that hinder E-invoicing penetration.

Athena (2004) defined that interoperability as the technical aspects of integration across different platforms, network devices and communication protocols, as well as the syntactic and semantic data formats. Here in E-invoicing, interoperability refers to the interconnected 3-party based service hubs with one another either inside a nation or internationally with an aim of expanding the network reach and offering a more complete service (EBA and Innopay, 2010).

Electronic invoicing is a typical example of a technology that enjoys significant network effects. Network effects are positively associated with the size of the network and there could be direct and indirect network effects. With the increase of number of adopters of electronic invoicing, an individual adopter can generate more benefits by enabling the exchange of invoices with a larger number of business partners. This could be seen as one example of direct network effects. Moreover, the increase in the number of compatible software and hardware solutions as the open standard diffuses will contribute to the scalability of electronic invoicing systems.

From a Basware (2011) report on E-invoicing, 41% of respondents believe that an open network to improve interoperability would reduce supplier costs for E-invoicing and 66% of respondents associated open supplier networks with flexibility, while 61% felt they offered increased efficiency. From the same report, 66% think that the increased flexibility offers more over traditional closed E-invoicing networks.

According to EBA and Innopay (2010), there are various ways of exchanging invoices including bilateral, 3-party and 4 –party models that are operating in the E-invoicing field. The following figure shows how it works under different exchange models.

Figure 4.13: Different Exchange Models
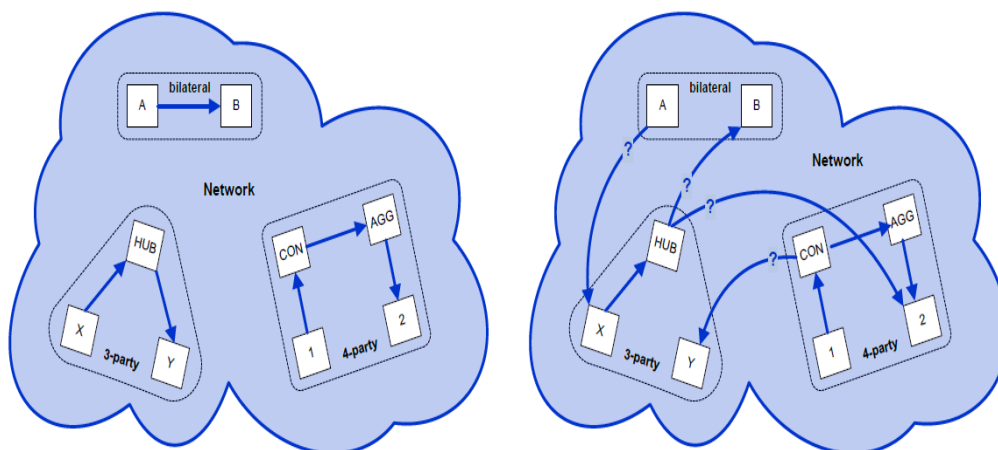
Source: EBA and Innopay, 2010, Reach issues with different exchange models co-existing on top of an open network infrastructure

In such an interoperable environment, messages could be transmitted from one network to another. It is essential to create the universal reach that E-invoices could be exchanged between service providers. And now with advanced technology, this can be achieved via message brokers, or via interoperability agreements between network hubs (EBA and Innopay, 2010).

Besides the various exchange models, the operators or service providers are also scattered in the market. When talking about E-invoicing market, users are always concerned with the fragmentation although it is seen growing rapidly. The market is filled with more than 400 operators (Billentis, 2009) who are based on a wide variety of business models and focusing on varying needs and different market segments. Generally in Finland there are four types of service providers: small start-ups, IT service providers, postal service operators and banks. Each of them has their own expertise and focus of market. However, the collaboration among them has been limited because the operators are seen as competitors to each other and they would be reluctant to cooperate. However, less than 40 service providers have a real critical mass of customers and business volume. This is not healthy for an industry to grow.

The number of players is expected to grow but there are also expectations of consolidated market. One suggestion from the Expert Group of European Commission is that service providers should focus on creating a layer of commonly accepted definitions, practices, standards and processes, which could serve as the basis on which market players can effectively compete. After national standards are set up, as the next step, international common practice should also be adopted in order to facilitate cross-border transactions.

Good news is that service providers have begun to connect with each other based on interoperability or roaming agreements in order to reduce fragmentation and expand network reach. The bank operators are capable of solving the problems of SMEs because of their payment networks while many non-bank service providers are good at business integration and IT skills. So it is with high potential that this market will perform very well with their cooperation and an open eco-system to exchange messages will be established.

A Common standard refers to the content of an E-invoice. Standards can help to create and ensure interoperability and hence make a contribution to decrease fragmentation of the markets. This is particularly important in fast growing markets with rapidly changing technologies. In their early study (Benjamin et al., 1990), it is reported that insufficient availability of standards has been the most important barrier to inter-organizational integration.

In Penttinen's (2008) paper a list of Standardization Initiatives on Electronic Invoicing was brought up. The benefits of establishing a common standard include cost saving such as lower reformatting costs resulting from more direct interoperability and lower service costs due to increased competition when users now could easily change service provider with compatibility in place. A common standard also makes it easier to standardize and automate other business documents like purchase order, sales record, payment and etc. Software would become a cheaper option for buyer when all of them support common standards and it will give rise to competition. Other advantages are related to easier tasks, for example, easier integration to back-end systems, easier solutions and more choices for presentment and storage, compliance management and roaming. As mentioned before, the biggest problem for E-invoicing is related to legal framework. With common standards applied, there will be a better harmonization of tax and legal compliance requirements in different countries. From technical point of view, the demanding requirements to secure the origin and integrity of E-invoices will be reduced because the common standards (Penttinen, 2008).

It is not easy to set up a common standard and requires efforts from different sides. Specifically for an E-invoice, the first step would be to agree upon the common set of mandatory and industry-specific data elements needed in all e-invoices. We have seen a lot of efforts put on this common content agreements, but further work need to be done to make it widely usable.

Standardization plays a decisive role in E-invoicing but is facing challenges. Firstly, a complete data set is in need so that it could be used in various domains. For example, tax settlement, payment & cash management and finance and etc. Secondly, there should be available data set suitable in 'common' SME to SME supply chains. Fortunately, this is under development with organizations around the world trying to develop the standards, for example, UN/CEFACT, OASIS & NES, ISO, CEN/ISSS and Finvoice from Finland. In addition, a minor point suggested by experts is that common practice should be shared. This is of particular importance to thrive of E-invoicing development and success.

4.3 Development of Measures

To build the framework and operationalize the constructs of the theoretical framework in the context of electronic invoicing, process-view and previous literatures are explored. This piece of

research distinguishes itself from Penttinen's (2008) in the way that it tries to build the framework suitable for E-invoicing and measures from the users' perspective. However, the framework and operationalized constructs of Penttinen's (2008) will act as guidance for building the research framework of this piece of research. At the same time, the model built in this research could also be regarded as a complimentary of the previous research.

Based on the idea explained above, it is necessary that we look at the theoretical framework and operationalization of the constructs in Penttinen's (2008) research at first place. As stated before, Amit and Zott (2001) framework was applied in Penttinen's (2008) research of how electronic invoicing operators create value. The identified four value drivers are efficiency, complementarities, lock-in and novelty. Penttinen (2008) then developed a set of measures. The following figure is showing these measures.

Figure 4.14: Construct and Operationalization Items of Value Creation

Construct	Operationalization	Description/question
Efficiency	Transaction cost per invoice	What is the full cost of one invoice to be delivered including the transmission cost and the eventual translation cost?
	Initial investment in technology	What is the start-up cost of implementation of electronic invoicing system?

	Network width	How many customer companies are connected to the network?
Complementarities	Converting paper invoices to electronic data and vice versa: scanning and mailing services	Does the operator provide scanning services (paper invoices scanned into electronic format) and mailing services (printing paper invoices and mailing them to customers that are not yet in the e-system)?
	Payment services and invoice credit services	Does the operator provide payment initiation, reconciliation, and credit services?
	Other trade process documents (EDI services)	Does the operator allow the delivery of other than e-invoicing trade documents?
	Invoicing handling systems	Does the operator provide document handling systems such as workflow management systems (e.g. internal invoice handling workflow systems)?
	Non electronic invoicing related services (tax payment, credit collection etc.)	Does the operator provide tax payment services? Does the operator provide credit collection services?

Lock-in	Customization	How customized is the operator offering to its customers in terms of interface and mapping?
	Community pricing	Does the operator charge extra fees for the invoice sent to other operators?
	Progressive pricing	Does the operator use progressive pricing (e.g. smaller transaction fees for large quantities of invoices)?
	Duration of contracts	What is the minimum duration of the contract?
Novelty	Participation in national/international public discussion	How much the operator participates to national/international discussion on standardization of electronic invoices?
	New services	Does the operator have distinctive new services in its product range?
	Technological innovation	Does the operator innovate new technologies (e.g. any format in any

		format ouot technologies)?
	Year of launch	When did the operator initiate electronic invoicing services?
	Responsiveness	How fast does the operator react to changes (e.g. legislation changes, customer requests)?

Source: Penttinen, 2008

As explained in the previous section on how the model is built and what it is about for each dimension of the model, I collected observed and perceived benefits regarding each value drivers. Also, the metrics from Penttinen's (2008) research are considered with amendments since the model has changed. Some of the operationalized items used for measurements are carried over directly, for example, for the dimension of efficiency and complementary services, because they are the same value creation as the original model. However, when I study further, I found that some of the items for lock-in and novelty could be revised or categorized into other dimensions under the new model though the two value drivers have been replaced by integration and network effects. A comprehensive review of literatures is also made to come up with all the metrics for better understanding of the proposed model.

In developing the measurement tool to analyze the value creation for operators, the process view is selected as the method of developing measurements for each dimension: Efficiency, Complementary Services, Integration and Network Effects. For each of the value creation sources, a set of measurement items is constructed based on the literature reviewed and expert opinions. Davenport (1993) defined a business process as "the specific ordering of work activities across time and space, with a beginning, an end, and clearly defined inputs and outputs".

Another contribute of E-invoicing metrics, especially regarding efficiency, comes from Lempinen (2009)'s research on "building metrics for assessing the business value of electronic order-to-payment cycle". In his study, Lempinen (2009) first analyzed the incoming e-invoice handling process, which is depicted in the next figure.

Figure 4.15: Incoming E-invoice Handling Process
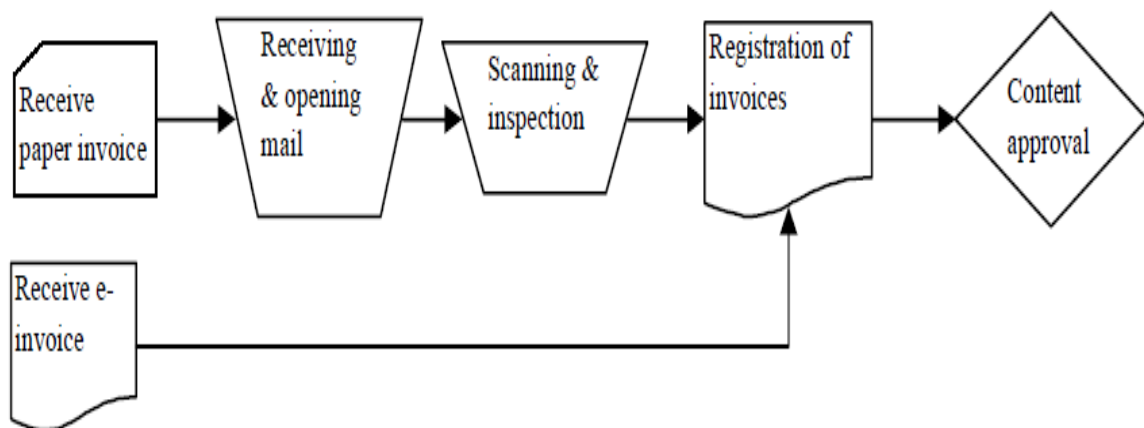
Source: Lempinen, 2009

As a next step, Lempinen (2009) collected perceived benefits and performance indicators from literatures. By summarizing the metrics in a table below, he finally came up with the causal structure of E-invoicing metrics, which is presented in Figure 4.16. And deriving from the Figure 4.16, the causal structure of E-invoicing Metrics is suggested as in Figure 4.17..

Figure 4.16 E-invoicing Metrics

Perceived benefits	Description	Source	Proposed metrics
Less errors in the invoice handling process	The amount of errors in the invoice handling process has decreased considerably	Penttinen (2008)	Number of processing errors
Free up resources	Resources can be better utilized in more productive work areas - sales, customer service etc.		Value added per employee
Improve organization image	Being able to attract more young professionals to work for the company		Employer image
Cut cost in the invoice handling process	An incoming paper invoice costs 30-50 €; e-invoice can cut up to 80% of handling costs		Invoice processing costs Non-value added manual work
Work morale benefits	Processing of e-invoices rather than paper documents seems reasonable for the invoice handlers		User satisfaction
Decreasing circulation time	Invoice processing time has decreased on average two days, even excluding mail delivery time	Penttinen (Ed.) (2008)	Invoice handling time E-invoicing cycle time
Increased transparency	Allows enhanced visibility of invoices, payments and hence the financial state of the company		
Enable real-time reporting	Invoicing data is directly transferred to accounting (the next step of RTE program)		
Less interest on overdue payments	When process cycle time decreases, more invoices are handled and paid on time		Interest on overdue payments
Environmentally friendly	By getting rid of paper bills in Europe would save 400.000 tons of paper, 12 million trees etc.	Penttinen & Hyytiäinen (2008)	Customers' perception of quality Consumption of materials and energy

Source: Lempinen, 2009

Figure 4.17: Causal Structure of E-invoicing Metrics
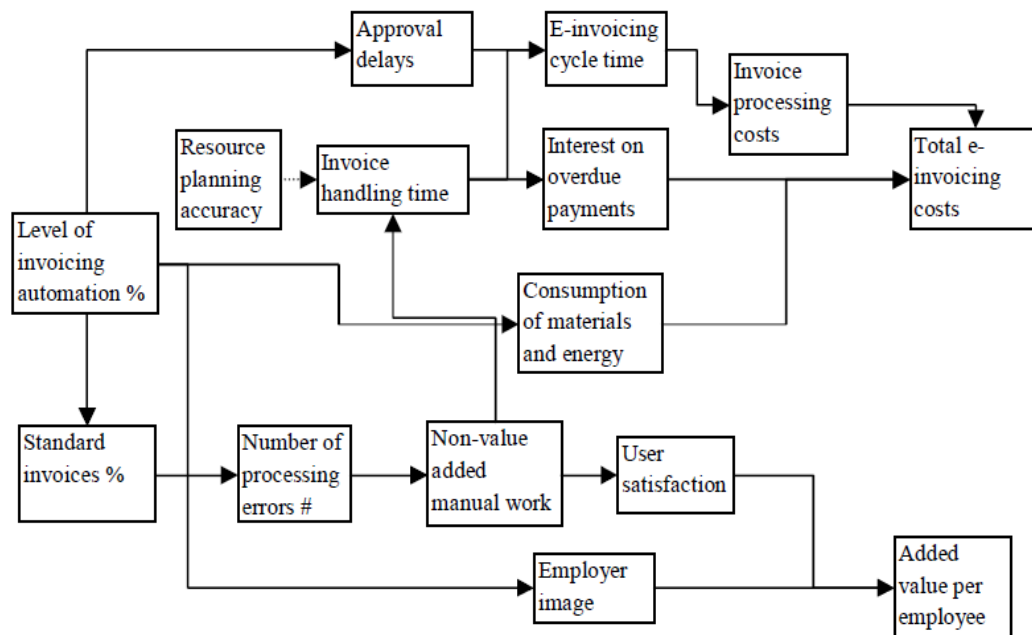
Source: Lempinen, 2009

Most of the benefits are recognized on the basis of efficiency improvements. As a result, I teased out some metrics unrelated to efficiency and come up with the set of measurements for efficiency in the model of this study. That is Invoice handling time, Invoice processing costs, interest on overdue payments and number of processing errors.

Some of the measurements for complementary services from Penttinen's (2008) research are used for the new model. For example, conversion service, payment services and non-electronic invoicing services. Another important item is added into the framework, which is supplier activation. It is added because recent studies show that supplier engagement is critical to the success of E-invoicing.

The measures that would reflect the effect of integration along the demand-supply chain are derived from Lempinen's (2009) study on measuring the value of electronic integration. If the processes are integrated, the entire flow of electronic documents from POs to final payment will work efficiently and laborious, lengthy, paper-intensive payment routines will be reduced. According to him, two most important indicators would be visibility and availability of information, and standardization of message. However, I moved standardization of message to measurement of network effects as discussed in the previous section on what do network effects mean regarding E-invoicing. Instead,

measurement like how much is the accounting process automated inside the company, how many disputes are dealt with, and how fast is the order-to-payment process.

As for network effects, some of the measurements for Lock-in are used because lock-in and network effects have similar influence on business operation. Items are how customized is the operator offering its service, how many exchange networks could be reached, how many suppliers could be reached and how is the progress of standardization.

So the entire framework could be shown in the following diagram. Starting from theory input including value chain, transaction cost, resource based view, EAI and Amit and Zott's model as well as experts' opinion, I established the four construct values, namely efficiency, complementary services, integration and network effects. Those four dimensions are slightly different from Amit and Zott's value creation model as it is intended to be suitable specifically for E-invoicing. As the further step, the measurement items for each value drivers are defined in order to operationalize the construct value into more measurable metrics.

Figure 4.18: Revised Framework of Value Creation for E-invoicing Operators
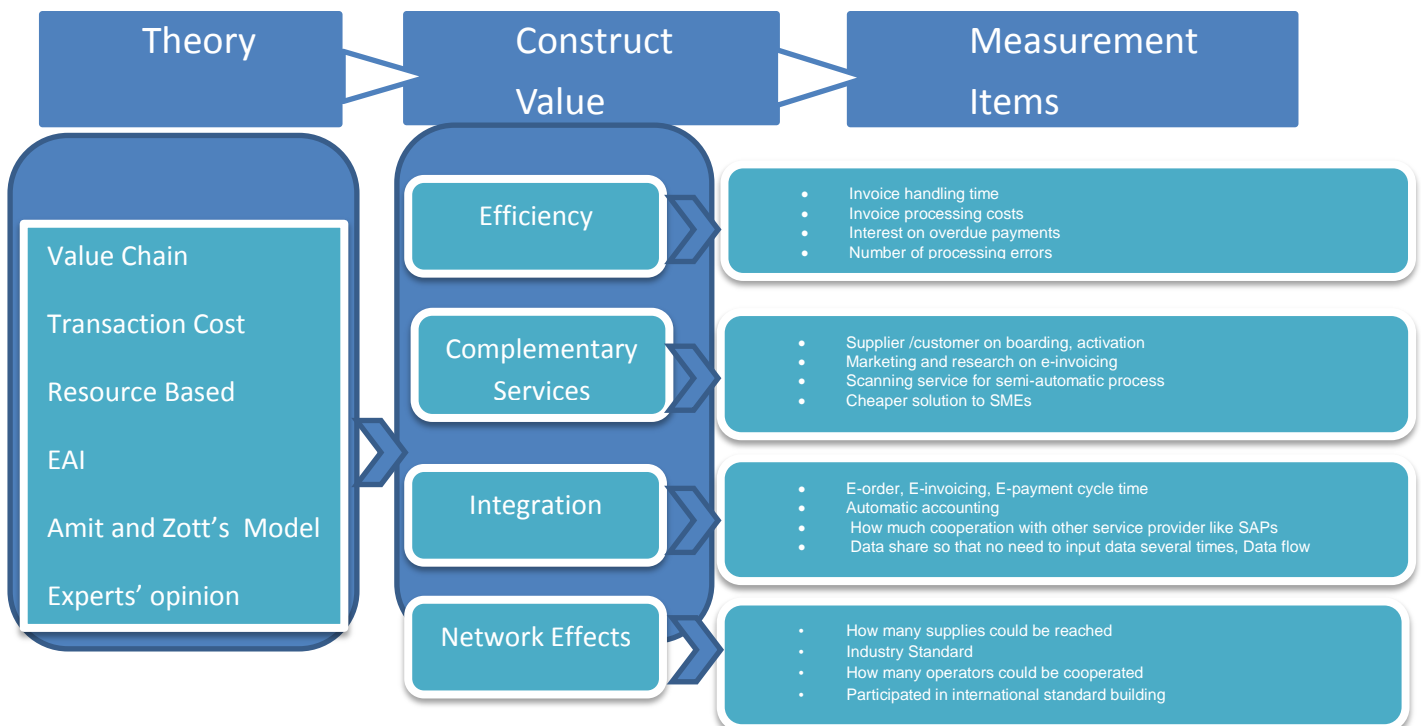
5 RESEARCH METHOD

The objective of this thesis is to identify the operators' value creation sources in electronic invoicing from users' point of view. When deciding on the research method, I thought about both qualitative and quantitative methods. But since this is an exploratory study and the model is newly proposed, I realized that it would be difficult to define the exact measurement of each dimension of this model in order to perform a quantitative analysis. So I chose qualitative analysis because it is better to test the model by putting it into a real company and conduct interviews. In contrast to quantitative research method, a qualitative research seeks to arrive at a theory that explains the behavior observed. It is an inductive way of researching on a topic. In order to determine the reasons behind a phenomenon, personal interviews and observation are used in a case study.

In the previous chapters, it was clearly depicted about the literature on value creation and how the new model was developed based on literatures. This is the traditional way of theory development, which is combing observations from previous literature, common sense, and experience. However, as Glaser and Strauss (1967) argued, it is the intimate connection with empirical reality that permits the development of a testable, relevant, and valid theory. So this model needs to be tested in reality to build the tie to actual data. Then case study method was chosen to finish the process because the case study is a research strategy which focuses on understanding the dynamics present within single settings. Yin (1984) said that case studies can involve either single or multiple cases, and numerous levels of analysis.

The purpose of empirical study is to test the modified model and see if it could stand in real life. This pattern-matching process is just like searching for an explanation. According to Campbell (1975), even only one single case could be used in the process because the pattern must fit multiple implications derive from an explanation or theory. So case studies in the following chapter match with the research objectives very well.

When little is known about a phenomenon and current perspectives seem inadequate because they have little empirical substantiation, then case study would be an appropriate method in answering the "how" or "why" questions about a contemporary set of events (Yin, 1994). Though E-invoicing has been talked about for a while, the question of how operators create value has been studied much. In this circumstance, studying how a company uses and views E-invoicing would be the optimal

way to tackle the issue. Van de Ven and Poole also argued that it is useful for studying the new area of longitudinal change processes. Now it is an early stage of research on this topic, so by studying on a new case, will fresh perspectives are likely to be built on this topic, adding up what was already done in research. However, as critics on the case study method argued there would be no grounds for establishing reliability or generality of findings from a small number of cases, there might be problems with generalizations of the case study results because it relies a lot on the company in question and for sure it will have biases on the findings. This pitfall exists also because case study research is only an exploratory tool. It is also going to be pointed out in the last chapter as a limitation and future research area to take a more quantitative approach in understanding the issue.

Yin (1984) defines the case study research method as an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used. Case studies emphasize detailed contextual analysis of a limited number of events or conditions and their relationships. It has been a very good type of qualitative research method and been widely used for many years by researchers. It is aimed to examine contemporary real-life situations and provide the basis for the application of ideas and extension of methods. Case studies are critical in helping people understand a complex issue or object. Often as a result of case study, extended experience and knowledge will be added to what has already been known through previous research.

Case studies typically use multiple data collection methods such as archives, interviews, questionnaires, and observations. I chose to do interviews with key informants in the case companies because it is the best way to understand E-invoicing in a specific company and further more to illustrate value creation sources. For each of the case companies, I conducted an intensive interview with the E-invoicing project manager of the company to understand how they perceive E-invoicing from users' point of view. I used an open-ended question form to do the interviews because it is better to collect ideas on a specific topic. Typically case study report is not reader-friendly because it is usually lengthy and follows no predictable structure, which proposed difficulty to both writers and readers. The prepared one-page questions help to avoid the problem by building up a pitfall may be avoided if a clear conceptual framework. I framed the questions into three stages, which are before use, during use and after use of E-invoicing. In this way, a case study narrative is replaced by a series of answers to those open-ended questions. This is of great use both for

conducting interviews and analyzing interview results because it is easier for the readers to find the desired information by skimming the entire text without difficulty.

This study tries to frame a value creation model, which offers a comprehensive view on how the operators could create value based on the users' needs. As a result, available literatures on value creation and Electronic Invoicing especially in Europe and Finland have been reviewed. In addition, interviews with company representatives and industry experts were conducted in order to get an idea how E-invoicing is being perceived in practice. Because E-invoicing is still quite a new research area and especially there has been little research done regarding the question of how operators could create value, the model has to be built based on a systematic analysis. Based on Amit and Zott's value creation model, together with literature reviews, the new model is proposed. Then a set of measurements for each dimension is also identified. After building the model, two case companies are studied to test the model.

6 EMPIRICAL STUDY

The purpose of this Chapter is to test if the proposed framework would stand in the real business. Firstly, the selection of case companies and interview method are introduced. It is then followed by the two case studies and analysis. At the end of this chapter, the case results and implications from case studies are presented.

6.1 Selection of Case Companies and Interview Method

Two case companies are selected for the interview purpose, UPM and Oriola. They are both participating in the research program Real Time Economy (RTE) and the contacts are provided also by RTE as well. UPM and Oriola are performing in different industries with various company sizes. UPM is a paper manufacturing company and Oriola is a leading Finnish pharmaceutical firm. They are chosen in order to compare the opinions from different industries. The project managers for E-invoicing from UPM and Oriola are interviewed with an open-ended questionnaire. The questionnaire was adopted from Penttinen's (2008) research and then edited specifically for these two interviews. Both of the interview questions could be seen from Appendix.

On designing the interview questions, the responsive interviewing model was adopted. The interview was organized by asking main questions. However, the interviewees' responses were fully taken into consideration as well by follow-up questions in order to allow interviewees to share their own experiences. The outline of the questionnaire composes four parts. The company background information was collected at the beginning of the interview. Then questions regarding E-invoicing usage in different stages, i.e., before, during and after, are asked and discussed.

The main questions were sent out to the two managers in advance of the interviews. Also the managers were encouraged to add more questions and topics if they want. Then for each of the companies, one hour on-field interview was conducted. Both of the interviews are tape-recorded and then transcribed. The following figure summarizes the general information of two interviewed companies.

Figure 6.1: Interview Company Profiles

Company Name	Industry	Revenue	Employees of company
UPM	Paper	10 billion Euros	24000
Oriola	Pharmaceutical	2 billion Euros	4300

This sub-chapter is going to present the two cases in details one by one. For each of the case study, the company's background information is first collected both from websites and by asking the interviewees. Then the E-invoicing project and results in companies are introduced. At the end, the perceived value creation sources are discussed from the interviewees' point of view. In section 6.2.1 UPM case is introduced. In section 6.2.2 the Oriola case is discussed.

6.2. Case 1: UPM

6.2.1 Company Background and Invoices

UPM is a fibre-based company operating in three business lines: energy and pulp, paper, and engineered materials. UPM was established in 1994 with a long history in Finnish forest industry. Today, with the creation of Biofore, UPM is leading a new forest industry by integrating Bio into forest business. In 2011, UPM, with a worldwide employee base of about 24,000 people, reached a sale of over 10 billion Euros and has production plants in 16 countries. 40% of UPM's business is in Finland.

Under the vision of being a Biofore frontrunner, UPM committed itself into sustainable development and good environmental performance. The idea behind E-invoicing is just in line with UPM's vision. E-Invoicing project in UPM was launched back in 2007 when Global Sourcing Organization was established and transition to new sourcing and procurement process started. This project was closing in 2011 and by then E-invoicing was seen as normal line-organization task in Purchase Invoice Handling. However, the Transition was still on-going with targeted suppliers.

The invoice handling work was quite huge in UPM. There are around 40,000 incoming invoices every month and among them 40% were electronic invoices on a company level by the time the interview was conducted. It was highly represented in Finland as 90% of the invoices in Finland were already in electronic form. Outside of Finland, the adoption rate was about 40%. In Germany, for example, the rate was between 30%-40%. The low adoption rate could be a result of cultural difference as well as the smaller size of UPM's operation in that country. There is a unit in UPM called Global Transaction Services, within which there are around 40 purchase invoice handlers.

6.2.2 E-invoicing project

Basware is the operator of UPM because the service provided by Basware fulfilled UPM's requirements. The project had two parts: technical part and service part. After technical platform was set-up, focus has been on supplier activation. The work is outsourced to Basware. At the start, Basware did a joint project with UPM on interface implementation stream and activation stream. At the later stage, the project has three main streams: supplier enforcement, supplier activation, supplier support. And by the interview time, UPM's focus has shifted to supplier activation. This need more support from Basware from UPM's point of view. Basware's work is to make sure they collect all the data and send them to UPM.

UPM has a Key Guideline for e-invoices usage. That is, only electronic invoices are accepted in Finland, Germany, Austria, UK, US and France. E-Invoices are preferred in countries where there are no legal restrictions for E-invoicing and UPM unit has a valid E-invoicing address. However as the manager mentioned, the transition period to E-invoicing is still on-going and paper invoices are still accepted in countries where by rules only electronic forms should be accepted. UPM has a

strong desire to switch to E-invoicing. It is actually very active in different E-invoicing forums and networking with other companies with similar E-invoicing initiatives to learn from each other.

From the user's point of view, generally E-invoicing is viewed as a faster way of doing invoice transition. The view is aligned with one of the value drivers in our research framework, i.e., efficiency improvement, which is just the fundamental benefit brought in by E-invoicing. The interviewee further mentioned E-invoicing is part of the value chain of E-ordering, E-invoicing and E-payment and she expected the automation of the whole process and no human touch along the value chain process. Again, the user's expectation could be reflected in the research model. Value chain operation automation could be realized by complementary services offered by operators. Moreover, integration implemented in a company will bring automation to this value chain as well. So two other value creation dimensions, complementary service and integration, are evidenced from the user.

6.2.3 Perceived Value Creation Sources by Users

Efficiency improvement was the primary drive in implementing E-invoicing by UPM because "UPM is continuously developing its functions and effectiveness". There are errors in sending and receiving data. Manual check is needed for those wrong invoices, which hinders efficiency. Also lack of data control is thought to be a problem by UPM. "Especially when using portal, UPM could not have the data control." it was mentioned by the manager.

Complementary services are not witnessed much by UPM. Basware is handling the compatibility problems with other operators. However, there are more data related issues and communication issues. Suppliers may not understand what is required in the E-invoice. Some of them do not even want to start using E-invoicing. A lot of work needs to be done in activating suppliers. In the current situation, UPM does not know much about the process of supplier activation because information is not updated by Basware. Definitely, there is a need from UPM's side to work closely with Basware on supplier activation projects.

Change management is essential in implementing E-invoicing project. Education and training need to be in place. Operators are not sharing knowledge on E-invoicing implementation because they treat each other as competitors. But it is not good to the overall E-invoicing development.

When there is a problem, four parties are involved. It would be nicer if the operator could cooperate to solve the issue so that the users (UPM and their suppliers) do not need to be involved in the discussion. Communication work needs to be done more on operator's side.

Even with E-invoicing now, full time employees are needed to do manual work, mainly matching invoices into ERP system. So integration is needed to consolidate all the information without human touch. Standard promotion and operator cooperation are seen as important. "A lot of efforts need to be put into this", the manager said.

6.3 Case 2: Oriola

6.3.1 Company Background and Invoices

With performance in the wellbeing and healthcare industry for over 60 years, Oriola has grown into the Finnish leading pharmaceutical distributor with solid logistics competence. Oriola has operations in Finland, Sweden, Russia, Estonia, Lithuania and Latvia and it does business with pharmaceutical companies, pharmacies, hospitals, veterinarians, convenience stores, healthcare shops and healthcare staff. Oriola is a member of Oriola-KD Group, which has a net sale of Euro1.9 billion in 2010 and employs 4,300 people. In Finland Oriola has around 400 employees and it reached a net sale of Euro 2,146 million in 2011 by an increase of 11.2% over the year 2010.

In terms of invoicing, Oriola has two separated function groups responsible for incoming invoices and outgoing invoices respectively. The scale of outgoing invoices, or sales invoices, is larger than the incoming because of Oriola's business nature. As for the incoming invoices, Oriola has a medium size. Every year there are 30,000 invoices handled. Among them, 20%-30% are in electronic form. For outbound invoices it is totally E-invoicing because there is a volume of

240,000 of outgoing invoices per year. Incoming invoices are smaller in terms of scale so it only has 4 persons handling incoming invoices. Also, Oriola is using different operators for their invoicing activity. At present, there is discussion going on inside Oriola about the possibility of merging the two functions.

The management has a positive view of E-invoicing and they perceived that "a lot of work could be saved" as a result of E-invoicing. The initiatives of E-invoicing stem from the sales side with an intention to make the process easier because they have large sales. However, as the manager said the intended benefits from E-invoicing for incomings lie more on better control of information, cash flows predict and also better matching to accounting system.

6.3.2 E-invoicing project

Basware was chosen as the operator for incoming invoices by Oriola because Basware is the pioneer in E-invoicing and has a high market share. Tiedo was chosen on the other for outbound invoices. The interviewee mentioned the consideration of combine into one operator.

The E-invoicing project was started in 2004 right after the launch of ERP system in 2004. It was done through several sub projects. The main part has already finished but the development is still going on.

Regarding the services offered by Basware, the manager pointed out that reliability and accuracy of information are the most crucial for usage, because "it would be a disaster if there is something wrong with the invoices".

6.3.3 Perceived Value Creation Sources by Users

Efficiency is observed. E-invoicing was set up to improve efficiency but it has problems during practice. Oriola did enjoy the lower transaction cost due to E-invoicing, but sometimes Oriola gets

errors in the electronic invoices related to accounting information and other times duplicate invoices arrive at Oriola. When this happens, they need to contact the operator and by dealing with suppliers the problem would normally be solved in one day. More work need to be done to improve the accuracy. Another aspect of efficiency is invoice data control. The users think they could be more efficient if they could have better control of the invoice data, which is now lacking in E-invoicing. It is less customized with the incoming E-invoices. They receive more information than they need. In that sense, the quality of electronic invoices is not good enough. Users expect to have more flexibility in choosing what contents should be included in a coming E-invoice. "Our outbound invoices are more customized", he said. This flexibility is on one hand about efficiency but on the other side could be a value creation source related to complementary services.

Complementary services are needed. Oriola would not want to switch to E-invoicing entirely in a very short time, so scanning service is used by Oriola at the same time. Semi-automatic services offered by operator could then be a value source potential. Besides small sized firms always have problem with installing the system. So operators should also provide affordable system installation to SMEs. Supplier activation is also seen as important. He said, "One good service from the operator would be that they could work together with us to persuade suppliers to switch to E-invoicing". Now the supplier contacting task is mainly on Oriola's own business. The manager thought that it could be a "win-win" situation if the operator works with Oriola together. Another way to reach this objective could be done by promoting E-invoicing concepts widely. As long as this concept is widely known by performing parties, it would be easier to convince suppliers to switch.

The manager also saw integration of system as important. In implementing E-invoicing, externally, suppliers need to be informed about this change and they are required to send electronic invoices. Internally, interface modification has to be made to the existing ERP system of Oriola. The manager said, Oriola did not have major trouble in the process. However a lot of communication was needed on what kind of services included and how the technical issues could be solved. Further development is needed as "Automatic accounting is not yet ready".

Network is very important. "Wide reach is needed". In fact the network width has raised a lot of attention of users. They expect the operators to expand their reach by enlarging the network. Finnvoice is used as the format for incoming E-invoicing, but wider standardized format is seen as the future development direction. Interoperability would benefit the users a lot if they are

implemented. Wider network also facilitate the information flow along the supply chain. Fully Integrating customers and suppliers will better off all the parties involved. "Operators could contribute in the value chain and work with the entire parties along the chain." Obviously, operators will make more values out of it by providing solutions in wider areas.

The concern held by users most is that the operators do not cooperate so much. The manager stated that cooperation between operators should be increased so that users could have the freedom to choose what they want. Common standard is also needed in order to make it easy for users to link to operator's system. Moreover, with common standard at place, "invoice information could flow to other parts conveniently".

6.4. Case Result and Implications

From both of the interviews, the four value creation resources, namely efficiency, complementary service, network and integration, were more or less identified. However, there are shared problems seen by both interviewees and those are the areas where the operators could create more value from. Also due to the nature of business and company size, the required serviced and potential services which could be provided by operators in the future varied by the users.

Both interviewees pointed out that efficiency is an important driver for their company to implement E-invoicing. As a result of the E-invoicing project, they enjoyed the benefits of faster transaction speed, less manual work and fewer errors. However, what need to be noticed is that they emphasized on different aspects although they shared the same efficiency improvement view. UPM is purely relying on E-invoicing to reduce their manual work and keep the organization efficient because they have a larger volume of invoices. Conversely Oriola saw more benefits on the side of better control of accounting information due to their relatively smaller volume of incoming invoices. This raises awareness to operators in how to differ their services to users with various profiles.

The users expected more services from operators, but it seems there are not many complementary services available at present. Besides handling invoices, the most urgent need from users would be supplier activation. Operators need to work closely together with users on persuading the suppliers into E-invoicing. Meanwhile support from operators is anticipated at a satisfactory level. Provision

of training package could be a very good channel to get E-invoicing knowledge spread among different parties.

Network effect is the most unseen but essential element from the users' point of view. They both stressed the importance of interoperability and wide reach of the network. Both of them thought that the operators should work together and there should be a common standard. Now in the E-invoicing field, this lack of shared standard use causes trouble and is seen as a huge obstacle on the way of E-invoicing development. When a service provider tries to satisfy its consumers, it is better to reduce the consumers' concern. Building up standards would be a good approach to do this. Another way to win over consumers is to allying with competitors and to interconnect with them. Interconnection becomes more strategic once networks begin to compete against each other.
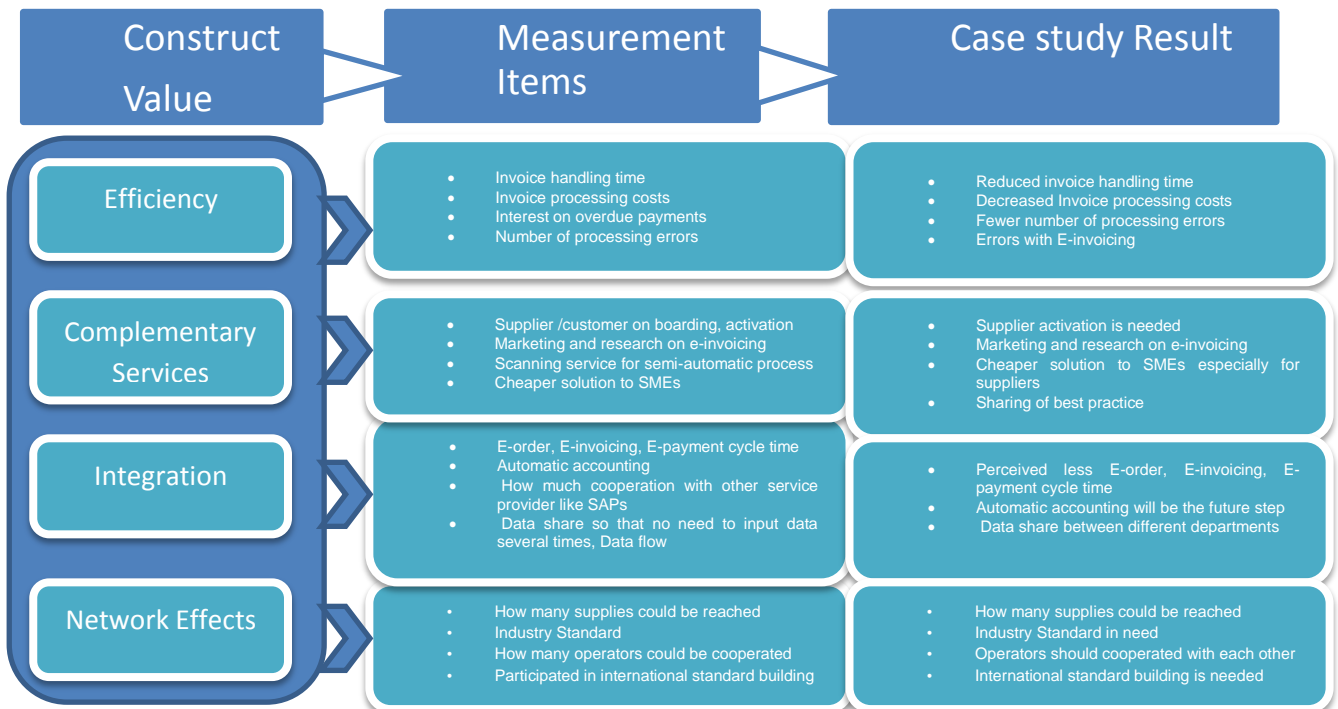
Integration into ERP system and the automation of accounting and even expend to the entire supply-to-demand chain have been regarded as the future trend. Companies could foresee the great business benefits with fully automated value chain system, but at the same time they know it will take time before they could reach that final stage. It is a definite goal and as a result a development area for operators.

The integration or automation needs to be done in stages by achieving part of the overall goal at each step. One company representatives also said that they do not want to change to electronic forms completely in a very short time, instead they would rather to do it step by step. In order to satisfy the client's needs, operators had better come up with a long-term plan which will give a full-view map to users before the start of E-invoicing. Automating accounting might be the first step, and then E-payment and E-ordering. Eventually and ideally, it could be integrated into the whole ERP system in a company so that Enterprise Application Integration will be achieved.

What has not been seen from the operator but is within the need of users is knowledge sharing. Reagans and McEvily argued that Knowledge sharing is a fundamental source of competitive advantage. The sharing of knowledge within and across organizational boundaries will provide with the opportunity to improve upon existing work practices and routines, improve inefficient work procedures, and develop new ideas and innovation. However, the sharing of knowledge is rarely observed among E-invoicing player in practice. As the company representative pointed out, there is no sharing knowledge on how to implement E-invoicing although there are already many companies doing so. Every company keeps it as a business secret, but then it happens that a lot of work is repeated and resources are wasted. If good practice is shared, this could be improved greatly.

In summary, the four value creation drivers are all observed in the two case studies. There has been focus on different items though. Some of them have been observed but others are mentioned as future development. It is summarized into the following figure.

Figure 6.2: Case Study Result

Construct Value	Measurement Items	Case study Result
Efficiency	• Invoice handling time • Invoice processing costs • Interest on overdue payments • Number of processing errors	• Reduced invoice handling time • Decreased Invoice processing costs • Fewer number of processing errors • Errors with E-invoicing
Complementary Services	• Supplier /customer on boarding, activation • Marketing and research on e-invoicing • Scanning service for semi-automatic process • Cheaper solution to SMEs	• Supplier activation is needed • Marketing and research on e-invoicing • Cheaper solution to SMEs especially for suppliers • Sharing of best practice
Integration	• E-order, E-invoicing, E-payment cycle time • Automatic accounting • How much cooperation with other service provider like SAPs • Data share so that no need to input data several times, Data flow	• Perceived less E-order, E-invoicing, E-payment cycle time • Automatic accounting will be the future step • Data share between different departments
Network Effects	• How many supplies could be reached • Industry Standard • How many operators could be cooperated • Participated in international standard building	• How many supplies could be reached • Industry Standard in need • Operators should cooperated with each other • International standard building is needed

7 DISCUSSION AND CONCLUSION

This Chapter serves as a summary of this study. Three parts will be presented. Section 7.1 will sum up the research tasks which have been done. Section 7.2 will discuss about the implication of this piece of research. At the end, Section 7.3 will point out limitations of the study and future possible research areas.

7.1 Research Summary

The purpose of this research is to examine operators' value creation in the context of E-invoicing but from the users' point of view. The topic is interesting and meaningful because E-invoicing has been developing for decades and the benefits of E-invoicing have been widely perceived and recognized. E-invoicing is a new and fast growing industry and it has raised interest of research in this area broadly. There have been studies on why businesses should shift to E-invoicing and how they could do it. Studies on adoption barriers and challenges have also been conducted as E-invoicing develops. However, there has been little research focusing on the operators, who are playing a very important role in the penetration of E-invoicing. This thesis then aims to tackle that question.

This study tries to answer the question of how E-invoicing operators could create value. It is based on the value creation model of Amit and Zott (2001), who identified four value creation sources in E-business, namely efficiency, complementarities, lock-in and novelty. This study examined whether Amit and Zott's (2001) model is applicable in the context of E-invoicing. After careful study on literature related to E-invoicing, it found out that two of the value driver need to be replaced by integration and network effects, which the researcher thought are more appropriate in E-invoicing. As a result, the revised model was proposed accordingly, with the new defined value creation sources, which are efficiency, complementary services, integration and network effects.

As a further step, this study tried to establish a framework by adding a set of measurement items for each of the four value creation sources. Those metrics are built upon on perceived benefits from available literatures and reports. The process approach is used to derive those metrics.

In the empirical study, two case companies are studied regarding their E-invoicing process. For each of the company, an in-depth interview was conducted with the project manager to understand how the users think about E-invoicing and their operators. With the help of interviewees, the proposed model was tested and verified. The four value creation sources are identified and mentioned by managers. At the same time, relative measures are raised during the interviews.

7.2 Implications

This section highlights the main findings and implications. From the case studies, it is found out that efficiency is still the main driver for E-invoicing adoption. And it has already been realized as part of E-invoicing project result. This is consistent with previous research in E-business. Regarding E-invoicing, more specific value creation sources are seen as important such as buyer-suppler collaboration and standardization.

Interactions between buyers and suppliers must be facilitated because effective interactions enable trading partners to access all the current information and documents, resolve disputes, monitor invoice and payment status, and dynamically establish trading terms. Expanding the network could be accomplished by offering solutions that could leverage the Internet along with standards such as extensible markup language (XML) for seamless data interchange and public key infrastructure (PKI) security for low-cost, secure document transmissions. In a study done by Kioses et al. (2007) of Measuring the Business Values of Electronic Supply Chain Collaboration in the case of E-invoicing, the researchers collected data both quantitatively and qualitatively in different scenarios and proposed that there is a point for retailers to try to persuade more suppliers to adopt E-invoicing because a supplier that delivers per store daily and will adopt the system will cause a reduction of 0.27 percent per invoice (Kioses et al., 2007). As a result, the savings for retailers will increase greater with larger volume of invoices.

The existence of such a service provides the basis for future more advanced collaborative practices for the supply chain. However, the large number of electronic linkages created empowers this base, by creating the opportunity for the cooperation of more partners. One of the informants also said that the service could actually participate in the whole supply chain and create value not only for the immediate users but also the customers and suppliers of the immediate users. Because it is an increasing tendency for companies to collaborate with their business partners along the value chain, the operators can take a role in any part of the chain and establish a long term relationship with the entire network.

Interoperability plays a decisive role in the electronic business environment. Interoperability makes it realistic that business partners can share information, understand and process exchanged data, and seamlessly integrate into internal ICT systems. One clear advantage of integration is that it increases visibility into vital status information and makes it easier for corporate finance professionals to develop accurate forecasts of cash flow.

The lack of interoperability between different E-invoicing networks is a significant challenge hindering suppliers from choosing the networks they want. Different networks support only proprietary document formats. So an open network is necessary so that any supplier, buyer or third-party vendor can send electronic documents in spite of non-existence of a certain proprietary technology.

Standardization of E-invoices is currently fragmented in the EU and worldwide. This creates obstacle to a seamless transfer and further cost savings potential. SMEs have difficulty in implementing E-invoicing due to lack of standard because they are typically cautious about investment. Without common standards, SMEs are reluctant to switch to E-invoicing. Legal aspects of an invoice also pose challenge to E-invoicing, such as VAT, and electronic signature. The lack of international rules on the validity and acceptance of E-invoices for legal, financial and administrative purposes makes cross-border transactions very difficult. Security, authenticity and integrity considerations are also regarded as risks in E-invoicing. Shared directories and practices could be another source for operators to create more value. Operators should also participate actively in standard discussion and setting up.

Users expect more services from their operators. Comprehensive invoice-to-pay functionality would be an effective solution which automates all core functions of financial settlement from the buyer's perspective. Those functions may include invoice receipt, validation, routing, dispute management,

approval processing, payment and posting, which are basically along the purchase-to-pay cycle. Integration of the entire supply chain will create great potential in cost savings and process simplification.

7.3 Limitations and future research areas

This study is a genuine attempt to solve the problem of how E-invoicing operators could create value and it came out with a revised model that has four value creation sources. However, the study also has its limitations and there are a bunch of areas worth further research.

Firstly, due to the scope of this study, it is limited to the receiving of an invoice. All the benefits are related to electronic incoming invoices. The selected case companies are limited to invoices receivers as well. Operators may find different value creation sources by studying from the invoice sending side.

Secondly, regarding the study itself, it has limitations on the sources of literatures and studies related. Some very important information about E-invoicing is only available in Finnish, either website or paper. Because of insufficient level of Finnish skills, this part of information was ignored. This, as a result, hinders on the knowledge of Finnish E-invoicing market specifically. However, the researcher believes that with more handful information of current research and development of E-invoicing in Finland, more reliable and resourceful conclusions would be obtained by study.

Thirdly, the model proposed in this study is suitable for general E-invoicing operators. This study does not distinguish between different types of operators. For example, bank operators and non-bank operators may have different competition advantages due to their core assets and abilities. Thus they do not necessarily seek values only through the four dimensions of the value creation model. Furthermore, they also may have different focus on the four value drivers, which has not been covered in this paper.

Further research areas could be the development of measurement for each of the dimensions. For example, quantified measurements items could be identified by doing an in-depth case study. Also the study of different value creation model along the adoption stage of E-invoicing could be constructed.

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Electronic Invoicing Company Interview Questions

Thank you very much for your time.

Company Background information

1. What is your main business? How many employees are there in your company?
2. How many incoming invoices are handled every month? How many of them are in electronic form?
3. How many employees are responsible for invoice handling?
4. When did the e-invoicing start? How long was the changing process?
5. What do you think about e-invoicing in general?

Preparing for e-invoicing

1. What is your company's motivation of using e-invoicing?
2. Which operator is your company using for handling incoming e-invoicing? Why did you choose this operator? Have you considered other operators?
3. What did your company do internally to start e-invoicing? Were there a lot of system changes to make the e-invoicing work?
4. What did your operators do with your company during the whole process of switching to e-invoicing? What support did you get from your operator?
5. What is the attitude of employees towards e-invoicing before implementing e-invoicing?

During use of e-invoicing

1. Is there any problem when you are receiving e-invoices from your suppliers? What kind of problem?
2. Are there any other problems during the use of e-invoicing? What are they? How did you cope with them?
3. What service is your company receiving from your operator (service provider) regarding e-invoicing? Besides that, what other service has your company received from your operator? What services does your company expect from your operator?
4. What are the impacts of e-invoicing on your business both internally and externally? For example the employees' work morale and the business relationship with your company's partners?

After use of e-invoicing

1. What are the changes you noticed after using e-invoicing? And what would you see as the benefits of using e-invoicing?
2. How do you measure the service of your operator?
3. How do you think of your operator's service? Are there any aspects you want to improve or you think there should be better service from your operator? What makes you stay with the current operator you have chosen?

4. What do you think is the biggest problem which makes e-invoicing hard to use? What would make you stop using e-invoicing?
5. How do you see e-invoicing in the future?

Time and signature: