

23.12.2009



School of Business
Supply Management

Bachelor's Thesis

**Benefits and implementation challenges of an electronic procurement system –
case x**

**Sähköisen hankintajärjestelmän hyödyt ja implementointiin liittyvät haasteet –
case x**

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1. Introduction

Due to continuing changes in different business environments companies are forced to make their businesses more effective, and minimize costs derived from different business activities. Firms have made e-business initiatives in many industries to better manage their internal business processes and functions and their interfaces with the environment (Wu, Mahajan & Balasubramanian, 2003). Earliest features of electronic procurement are from the 1980s when MRP (Material Requirements Planning) and MRP II (Manufacturing Resource Planning) were a remarkable part of companies businesses (Shoenherr & Tummala 2007).

In the 2000-century, different business functions like sales and purchasing, have moved to electronic business environment. Electronic business has multiple benefits but it also contains risks which may cause massive harm to business. Electronic procurement is a relatively young research area in scientific literature Earlier studies (Kauffman & Mohtadi 2004; Croom & Brandon-Jones 2005; Keiser 2000; Morrison 2009) mostly concentrate on the influences, benefits, and challenges of electronic procurement.

The thesis consists of five phases which are: the introduction, the theoretical context, the research process, the research results and the conclusions. The thesis is done to the case company and its purpose is to produce information for the company and its needs. The research question of the thesis concentrates on the benefits and challenges of an electronic procurement system to the case company. The goal is to identify the most valuable benefits and the biggest challenges by using academic literature and interviews.

1.2 Research problem

The aim of the research problem is to summarize the essential content of the research. According to Koskinen, Alasuutari & Peltonen (2005) every research consists of a question that is common and descriptive in the beginning. Therefore, the research question becomes more accurate with several smaller questions when hypotheses develop.

The research problem can be shaped as a question:

- **What are the benefits and challenges that implementation of an electronic procurement system causes in the target company?**

The research problem arises from the idea that companies need to find new ways to improve their purchasing operations and business processes. In today's business world one important way to enhance purchasing functions is to benefit from electronic marketplaces and electronic purchasing. This means that companies have to abandon their traditional purchasing models and deploy new electronic ways of procurement. Adopting an e- procurement system is a complicated process where companies need to be aware of different influences of implementation. Researcher uses the main question as a way to clarify the benefits that the case company gets from the e-procurement system, and to bring forth those challenges that system causes to the company's business functions and processes.

In many cases, the benefits that an e-procurement system creates to companies' businesses are not clear. This can be seen especially in companies where (for example because of the nature of the industry) a systematic procurement has not been an important sector of their business processes. This creates a need to clarify the effects that implementing an e-procurement system cause. By paying attention to both, benefits and problems, it is possible to ensure a successful implementation of an e-procurement system.

Sub questions are created to support the main question and also to specify the research problem. In this study the sub questions are:

- To which business and purchasing functions and processes the implementation benefits and challenges are aimed to in the case company?

- What kind of things should be noticed during the implementation process so that the benefits can be maximized and the challenges minimized?

The first sub question concentrates on the specific benefits and problems of an electronic procurement system. The question's purpose is to map where the benefits and problems are seen. These objects are for example processes or functions inside or outside the company. The second sub question creates a foundation for the required actions based on the recognized benefits and problems.

1.3 Objectives, goals, and limitations

This study participates to the discussion about the usefulness and appropriateness of an electronic procurement system especially as an enhancer of companies' purchasing operations but also in companies' overall business processes. The purpose is to explore with the help of the case company, what kinds of main benefits does an electronic procurement system produce, and on the other hand, which are the main problems that an implementation of an e-procurement system causes.

The goal of the thesis is to produce information about the benefits that serve the case company's needs and problems that may occur in case of implementing an e-procurement system. Thesis is based on literature, scientific articles and empirical information from the case company. The goal is to create a mapping of those most important positive and negative effects that system implementation causes.

The purpose of the thesis is not to explore all those effects that implementation causes to companies business activities at a common level, but to recognize those

main factors which are important and relevant to the case company and tightly linked to the company's business functions. The thesis is been outlined to concern about the case company's business environment, and recognizable factors are linked to the company's action and needs. The meaning of outlining is to point out the benefits and usefulness of an electronic procurement system as an enhancer of case company's purchasing operations and business activities. Moreover the thesis tries to identify the possible challenges that implementation may cause so that the case company can be aware of the problems and can prepare actions to prevent them to occur.

1.4 The key terms

The key terms of the thesis are procurement, electronic procurement, electronic procurement system and implementation. Procurement and electronic procurement can be defined in many ways.

For example, in B2B-markets **procurement** (same as purchasing) is seen as a process where companies buy different goods and services to fill their needs. In purchasing goods it is important that companies consider following things before the purchasing decision is made: to buy at the right time, at the right quality and quantity, at the right price and from the right source (Baily, Farmer, Jessop & Jones, 2005, 3).

Electronic procurement also means buying different goods and services. Compared to the term procurement, difference is how the process is being handled. Commonly, electronic procurement process is fully electronic. Murray (2001) sees electronic procurement as purchasing of products and services by utilizing different electronic technology. Utilizing electronic technology means, for example, getting benefits from an Internet environment and its possibilities. Walker & Harland (2008) define e-procurement as the use of information technology to ease B2B purchase transactions for materials and services.

Electronic procurement system (same as e-procurement system or electronic ordering system) is a system based on computer software and technologies. It

includes all the phases of a purchasing process, for example from the need of purchasing to purchasing orders and receiving products. (Arbin, 2008) An e-procurement system makes it possible to run and control the whole purchasing process through a one software. This possibility is a huge benefit for companies who need to boost their purchasing and business operations.

Implementation means that some kind of a plan is going to be realized. This means, for example, that a planned procurement system is taken in practice. When a new system is implemented, it is important that the focus is on those factors which are caused by implementation. Implementing a system has positive and negative effects to organization and its business processes.

1.5 Methodology

Methodology is a common approach to explore the topic of the thesis and it is useful if it serves the research in practice (Metsämuuronen, 2001, 9). This thesis is a qualitative research. According to Alasuutari (2001), a qualitative analysis consists of two different stages: simplifying perceptions and solving the case. It is important that when simplifying perceptions, research material has to be examined from specific theoretic-methodological obstacle (Alasuutari, 2001). Researcher must be able to combine different perceptions (Alasuutari, 2001, 39-40). Solving the case means that researcher has to interpret the results of the exploration. There are a lot of different case solving models from which a researcher can benefit from. Picking a model depends on what kind of theoretical concept the model has (Alasuutari, 2001, 44).

The first phase of this thesis is to get orientated to the literature and scientific articles concerning the topic of the thesis. Meaning of the literature overview is to create a theoretical context and the base to the thesis. The theoretical context is the main frame to which the whole thesis can lean on. The purpose is to collect information from different sources and combine it to a one big picture.

The empirical part of the thesis is qualitative, because the research material is based on the information from the interviews of case company's employees. The interviews are half-structured. In a half-structured interview questions are predetermined and same to all of the interviewees. Interviewees can answer the questions with their own words and without any made up answer possibilities. (Eskola & Suoranta, 2000, 86)

This thesis is also a case research. The purpose of the case research is to explore one or more specific cases which are chosen by some particular reason. A case can be a functional entity or a big organization. It can also be a part of an organization. Case research is one of the most significant and common qualitative methodologies used in the field of business economics. (Koskinen et al. 2005, 154) This thesis tries to describe things through the case company and purpose is to produce information to case organization and its needs.

1.6 Structure of the thesis

The first part of the thesis is the introduction. The objective of this part is to lead the reader to the topic of the thesis. The second part of the thesis is the theoretical context. It introduces reader to the B2B-purchasing and deals with the electronic procurement systems as enhancers of different purchasing activities. The purpose of the theoretical context is to point out the significance of electronic purchasing to the companies' business functions. The theoretical context deals with the effects that electronic purchasing and electronic procurement systems develop.

Here are the key factors of the theoretical context of this thesis:

- Describing the significance of electronic procurement in companies' businesses and purchasing operations
- Finding and describing the effects that electronic procurement brings to business

After the theoretical context is the description of the research process. Firstly, this part contains the timetable of the thesis and the description about how the thesis has proceeded. Meaning is that everything is shown in a time order. The second paragraph is about how the material is being collected for this thesis. The third paragraph describes how collected material has been processed. The fourth paragraph describes how the material has been analyzed. These last three parts are remarkable for the whole research process. The last paragraph discusses about the reliability and validity of the research material.

Next phase of the thesis is presenting the results of the research. Firstly, the researcher describes the objects of the empirical research. Then the research material, produced by the interviewees, is analyzed and these answers are collected as the results of the research. Results describe the situation of the case company and clarify what are the factors affecting the firm's business activities.

The last phase of the thesis is conclusions. The meaning of the conclusion part is to summarize the whole thesis and its key factors. Researcher considers the thesis as a whole and which are the key factors of the research results. The future research possibilities are also presented in the conclusions. At the end of the thesis is the list of references used in this research and attachments.

2. E-procurement - increasing the efficiency of business processes and purchasing operations

This chapter concentrates on e-procurement as an enhancer of purchasing operations and different business processes and functions. The objective of this part is to create a theoretical base to the whole thesis. This chapter works together with the empirical part creating a one tight entity.

2.1 Purchasing based on electronic technology

Increasing competition, more demanding customer needs and profit maximizing of firms have inevitably led to a situation where traditional business models are not able to fill the needs of customers and companies anymore. Traditional purchasing in today's B2B environment is an ineffective and expensive way to buy goods and services. Angeles & Ravi (2007) state, that purchasing is one of the biggest expenses in companies' overall costs. Especially the purchasing of non-production goods and services is the biggest single expense item for an enterprise (Attaran & Attaran, 2002). Using electronic technology in purchasing operations makes it possible to gain numerous benefits to companies' business processes and internal functions.

E-procurement is an important part of e-business. E-business is able to create massive new wealth and change the traditional ways of business to a more modern and effective direction. (Knudsen, 2003; Amit & Zott, 2001) The challenge is to recognize all important possibilities and adopt tools of e-procurement, and eliminate those factors that are not key elements for success (Knudsen, 2003).

E-procurement only automates procurement (Avery, 2000). Companies are using different Internet trading exchanges (ITE) to automate and streamline their procurement processes (Kalakota & Robinson 2001, 307). Procurement is nowadays more than a traditional support function; it is a tool for creating value for company and customers (Kalakota & Robinson, 2001, 308). This means that companies must define their procurement strategy and goals. According to Knudsen (2003) procurement strategies must be tightly linked with corporate competitive strategies. Knudsen (2003, 720) notes: "By developing a procurement strategy which focuses on the character of its competitive strength, a firm can enhance its market position." With effective procurement strategy, it is possible for employees to reduce paperwork and fully concentrate on their jobs (Kalakota & Robinson, 2001, 307).

It is important that a company knows what to do. This means that e-procurement goals must be defined. Kalakota & Robinson (2001, 338) introduce four typical goals of e-procurement:

1. *Fully automated selection and purchasing of goods.*
2. *A systematic organization-wide cost reduction.*
3. *Fast and accurate reports to organization-wide purchasing patterns.*
4. *Eliminating the possibility of unauthorized workers to purchase goods and services.*

Fully automated selection and purchasing of goods is the base goal of e-procurement. Through this goal companies are able to achieve a systematic organization-wide cost reduction. Fast and accurate reports make it possible to manage e-procurement and its processes. The fourth goal is often the most challenging goal for companies to achieve. The risk that unauthorized workers are able to purchase goods and services is very high in many companies of different industries. Procurement cannot be effective if it is not organized, and if employees are able to purchase whatever they want. When companies are adopting an e-procurement system they should establish a buying center. According to Garrido et al. (2008) the buying center consists of those employees who are in some way connected to the purchasing process. When companies have a buying center and buyers, they will eliminate the possibility of unauthorized employees to purchase materials. The most important thing is to understand what kind of an e-procurement strategy, goals and software solution are suitable for company's own business activities and its processes.

When a company has determined its e-procurement strategy and defined its goals, it is ready for e-procurement. Without these preparations, implementation of electronic procurement is not possible. Goals and strategies can vary between different organizations and industries.

B2B via Internet is growing rapidly. Evolving technologies have made it possible to reduce manual work and transfer almost all business activities to the Internet. Croom (2000) shows the IDC corporation forecast of Business-to-Business E-commerce

use. The following forecast shows that electronic business has grown a lot and will grow a lot more in the future:

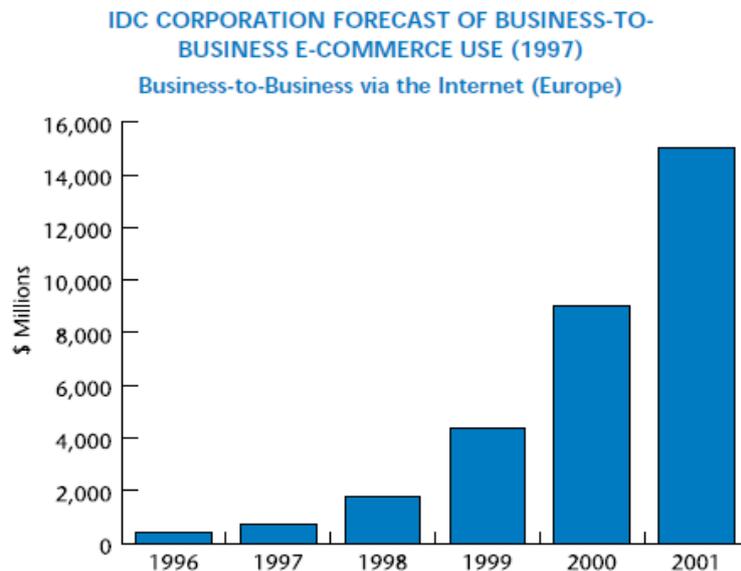


Figure 1. IDC Corporation forecast of Business-to-Business E-commerce use (1997) by Croom (2000)

Kalakota & Robinson (2001, 310) recognize different models of e-procurement. These models are shown next page in figure 2. There are seven different types of them and every model includes few key characters.

Companies who develop their purchasing processes using electronic technology need to be fully aware of their procurement strategy and procurement cycle. One of the biggest key factors in electronic purchasing is the electronic purchasing system. This system needs to be linked with the development of purchasing process. Next chapter focuses on purchasing systems and how these systems are a part of the purchasing process in electronic markets.

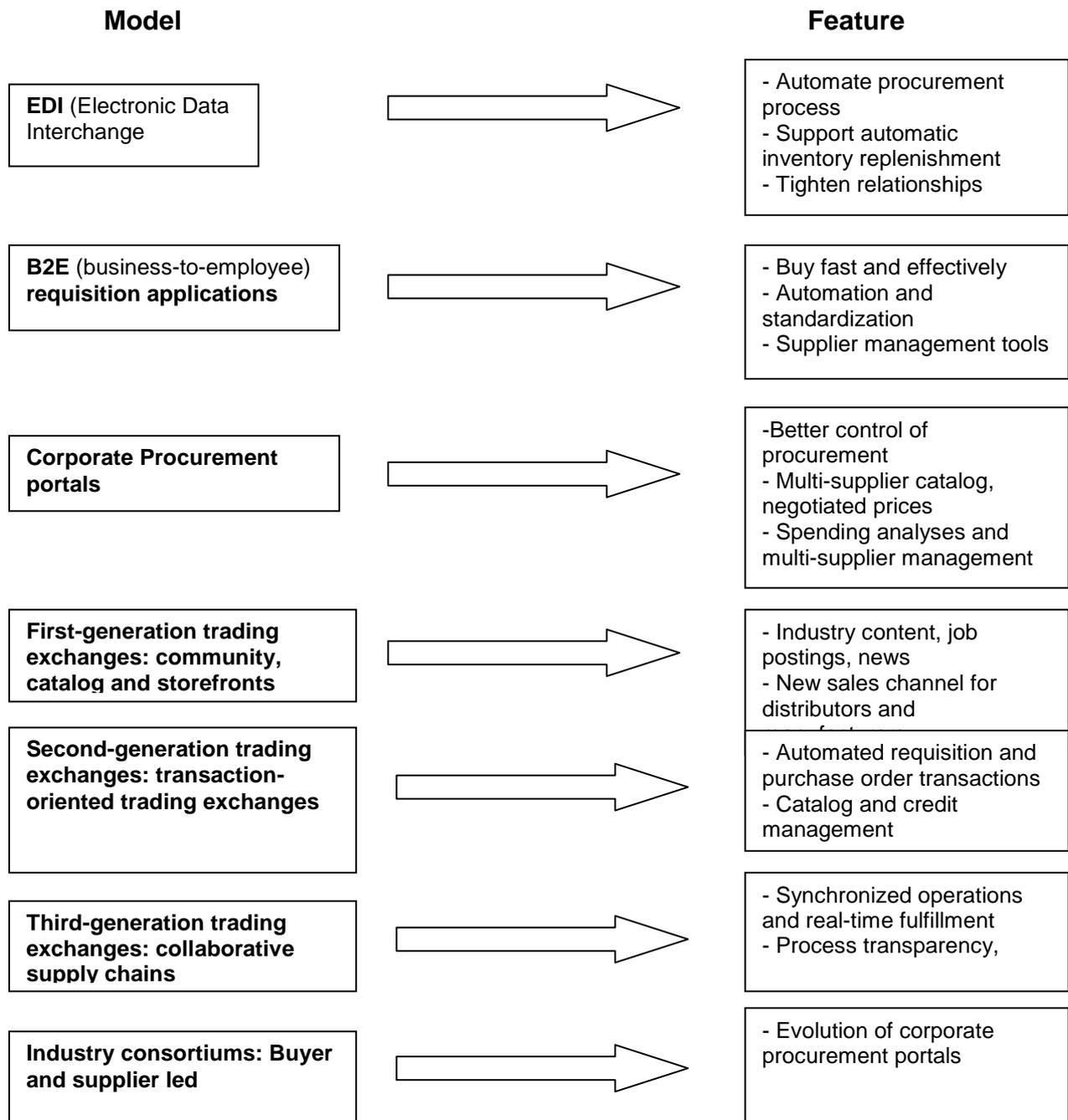


Figure 2. Different e-procurement models, modified from Kalakota & Robinson (2001)

2.2 Electronic procurement systems

Every organization and their needs are different. This is the reason why procurement cycles vary so much between different corporations. A basic procurement cycle

begins from identifying the need, and ends to the phase where identified needs are satisfied. (Baily et al. 2005, 370) A common procurement process is shown in figure 3.

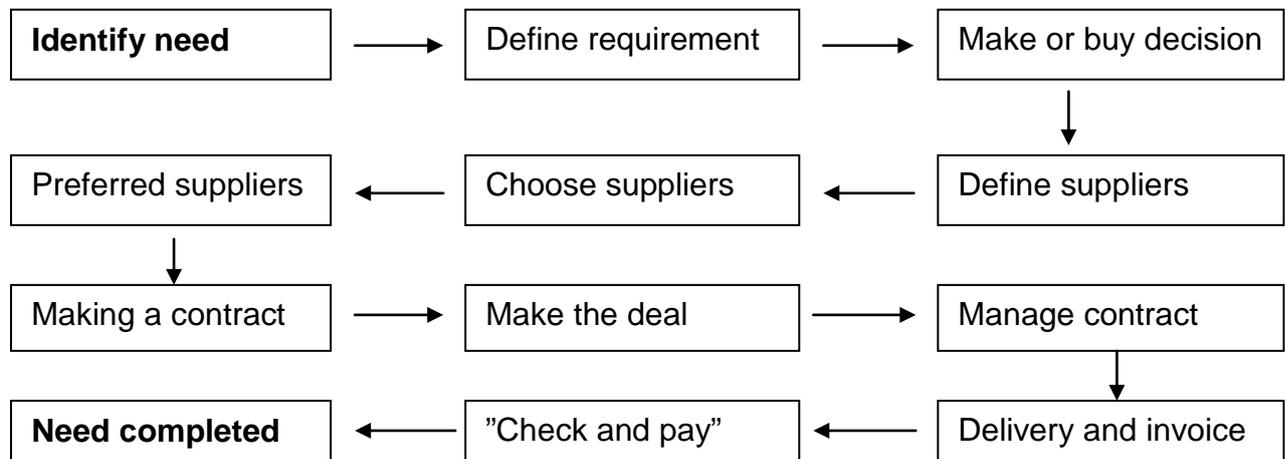


Figure 3. A procurement process by Baily et al. (2005)

According to Subramaniam & Shaw (2004) big companies spend nearly 30 % of their revenues on procurement of non-production goods and services. Procurement of non-production material, for example, office equipment, computers and other material cause problems in the traditional field of B-2-B procurement. These problems are mostly related to inefficient procurement habits, manual procurement processes, non-strategic purchasing and maverick costs (Subramaniam & Shaw, 2004). Arbin (2008) notes that the biggest reason why companies implement an e-procurement system is the demand to reduce maverick costs and increase compliance in choosing suppliers. Subramaniam and Shaw (2004) find that most of these problems can be eliminated with the help of e-procurement systems. The meaning of these systems is to automate the traditional manual procurement process by using a computer-based software solution. An automated system makes it possible for companies to transfer and exchange real-time data and information using electronic technology. (Subramaniam & Shaw, 2004)

A basic web-based procurement system is shown in figure 4. Figure describes how the procurement process works in an automated electronic environment and how different purchasing functions are related to each other.

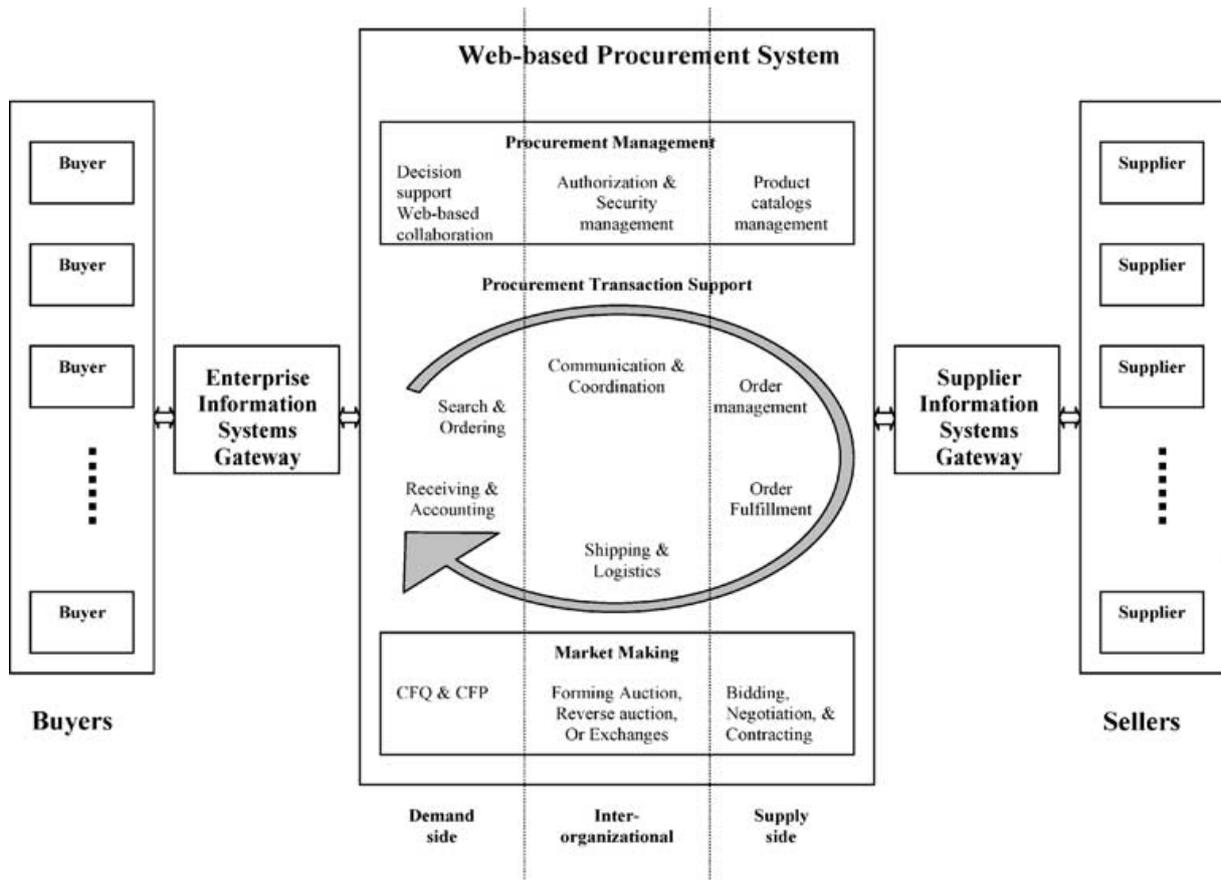


Figure 4. A web-based e-procurement system by Subramaniam & Shaw (2004)

Figure shows that in a Web-based procurement system the whole purchasing process is managed by the software. Procurement management, procurement transaction support and market making creates an entity, where the actual procurement happens. Supplier- and enterprise data are support functions, which support the middle process and its activities. Together, these functions automate the procurement process.

2.3 Implementation of an e-procurement system

The examination field of electronic procurement is still in its early shape but is evolving quickly. Previous literature recognizes a lot of benefits and challenges that companies are facing when they implement an e-procurement system. Teo & Lai (2009) see electronic procurement as a way of reducing operations costs, enabling

volume purchasing, improving delivery and decreasing paper work and manual order processing costs. Murray (2001) claims, that Internet-based B-2-B buying and selling is the most low-cost and efficient way to pursue commerce. E-procurement and e-procurement systems make it possible to decentralize operational procurement processes and centralize strategic procurement processes, which mean more transparent supply-chains (Puschmann & Alt, 2005). Challenges often refer to the implementation process and integration between procurement system and organization functions. For example, Angeles and Nath (2007) found that most significant challenges that procurement system implementation brings to business, are connected to the systems integration and standardization.

Several articles concentrate on the benefits and the challenges associated with e-procurement system. (Angeles & Ravi 2007; Keiser 2000; Knudsen 2003; Murray 2001; Puschmann & Alt 2005) In this thesis these single factors are joined to groups so that the most significant benefits and challenges can be shown at a common level. Moreover, in some articles (Keiser, 2000; Murray, 2001) it is found that the significance of collaboration is irreplaceable for the implementation and must be noticed before and during the implementation process.

In general, an idea of implementing an electronic procurement system is a consequence of a need to make business activities more effective. Murray (2001) discovers that electronic procurement produces the biggest value for companies who need to better manage their business processes, reduce costs and strive for greater financial performance.

Implementation of an electronic procurement system is not a simple process to be completed. According to Hayward (2001) the benefits of electronic procurement are clear and widely recognized but she warns that the system must be implemented correctly or it will never work. Many companies don't understand the meaning of thorough preparation. Mostly, this is the reason why planned actions do not come true and changes in effectiveness and cost reduction stay low.

First step towards a successful implementation process is the demand of collaboration and commitment. Because of the lack of collaboration and systematic

action, company buyers are wasting time on activities which do not produce or add value (Angeles & Nath, 2007). Keiser (2000) states, that the main reason to the successful use of electronic procurement is collaboration. He also emphasizes that real-time information for customers is needed and this information comes from the collaboration and commitment of buyers and suppliers. This is the way to successful implementation and use of electronic procurement. Keiser (2000) also reminds that success in e-procurement means integration. He continues by saying: "It is not about having a Web-site, but about working within a customer's system." (Keiser, 2000, 80)

Organizations use millions of dollars on information technology systems, because they see IT (Information Technology) as a way to successfully compete in the markets and improve efficiency and productivity (Arbin, 2008). Information technology by its-self will not do all. Tight collaboration between customers, suppliers and companies secure the benefits of IT. Implementing a system demands that buyers and suppliers give support to each other, because otherwise implementation is not possible (Keiser, 2000).

Walker & Harland (2008) recognize several factors that influence the implementation of an electronic procurement system:

Organizational factors

The size of the organization and the type of the operation has an effect on the implementation of a system. E-procurement is commonly recognized in bigger than smaller organizations. The operations of the organization often determine whether e-procurement is needed or not.

Readiness factors

Management of the organization must collaborate and make collective decisions relating to implementation. All decisions affect on e- procurement strategy. Organizational readiness is about decisions, preparation, collaboration and commitment.

Supply factors

E-procurement implementation is about integrating supply-chains. Organization gets the greatest benefits when procurement software is fully integrated with the supply-chain. Thorough integration is the same as an effective supply-chain.

Strategic factors

E-procurement strategy should be tightly linked to corporate and business strategies. This is a way to gain competitive advantage. Also Knudsen (2003) supports the meaning of strategic factors in implementation of an e-procurement system.

Policy factors

Public procurement can be a mean to support government policies. This can be done through e-procurement and traditional processes. In the public domain, electronic procurement makes it possible to support the delivery of public procurement policy. E-procurement is a policy tool, which improves transparency and efficiency.

2.4 Implementation benefits

Implementation of an e-procurement system delivers numerous benefits to companies and their business activities. Many previous studies (Subramaniam and Shaw 2004, Croom and Johnston 2003, Puschmann and Alt 2005) find several single positive effects that e-procurement implementation has. Grounded on these studies, the most important benefits can be gathered in to three different groups which are cost savings, supplier management and process and functions efficiency.

Cost savings

Electronic procurement system automates the manual process of procurement. Automation means massive savings in cost structure. Firstly, savings are seen in

purchasing of non-production goods and services, like office equipment, travel costs and computers (Subramaniam & Shaw, 2004). Automated Web-based system makes it possible to negotiate better prices with suppliers because the system can provide centralized and accurate visibility of the enterprise-wide procurement information (Subramaniam & Shaw, 2004). Subramaniam and Shaw (2004) also recognize benefits in reduction of transaction costs. These savings are related to suitable product and supplier search, negotiation costs, contracting costs and coordination costs. According to Croom & Johnston (2003) with the help of e-procurement, the cost per transaction is 65 per cent less than the costs per transaction in traditional field of procurement. Puschmann & Alt (2005) state that e-procurement consolidates sources and controls maverick buying, which means massive cost savings. Electronic procurement offers massive reduction of paper-work and reduces the amount of work that does not add value to company and its customers. (Kalakota & Robinson, 2001, 307)

Controlling the costs is the biggest challenge almost in every industry nowadays. Eliminating costs is also the biggest reason why companies implement an e-procurement system. One of the biggest opportunities to reduce costs is material purchasing. Automated e-procurement systems enable companies to control and manage purchasing decisions and procurement process. This means higher efficiency and more profitable business. (Morrison, 2009)

Supplier management

One of the biggest improvements that systematic e-procurement brings to business, is more dense group of suppliers. Angeles & Nath (2007) emphasize that the reduction of the amount of suppliers is very important. Through this activity companies can achieve cost savings and better negotiation and contract terms. In other words, e-procurement system demands a small group of preferred-suppliers so that management of different purchasing activities would be effective and e-procurement would work. Efficiency of an e-procurement system is based on real-time information exchange, collaboration and commitment between a company and a tight group of preferred suppliers.

Subramaniam & Shaw (2004) also recognize that with Web-based e-procurement system, companies are able to increase the power of bargaining with suppliers and negotiate better terms and conditions to their contracts. With the help of e-procurement, company employees have direct access to their suppliers systems and data. This means that the employees are able to see different technical specifications, product descriptions, product pictures and price information. (Teo & Lai, 2009) E-procurement also makes it possible for organizations to pursue more complex information exchange with suppliers and improve supplier relationships (Croom & Johnston, 2003).

Process and function efficiency

E-procurement is a way to gain efficiencies in companies' processes and functions. E-procurement literature notices that process efficiency can be increased through internal process efficiencies and automation. (Croom & Johnston, 2003) Using Internet-based technologies enable faster and more effective operational purchasing processes. This helps the employees of purchasing department in letting them to concentrate on more strategic functions. E-procurement brings simplifications to the materials procurement. This reduces the operational workload of buyers because the operational procurement process is decentralized. (Puschmann & Alt, 2005)

Morrison (2009) finds that the benefits of an electronic procurement system can be seen in faster turnaround times and in shipment and delivery times of the product. According to Croom & Johnston (2003) companies achieve process savings when they move from paper-based systems to electronic solutions. Electronic solutions enable electronic orders, invoices and payment. This means fewer errors in transmission. E-procurement brings more availability to business: process lead times are much lower than in traditional purchasing. (Croom & Johnston, 2003)

Efficiency consists of processes, products and inventory savings. Effectiveness means proactive management of key data and high-quality purchasing decisions in the organization. If the traditional procurement processes and functions are

complicated and extremely ineffective, then e-procurement implementation will bring massive benefits and cost savings to company. (Puschmann & Alt, 2005)

2.5 Implementation challenges

Implementation of an e-procurement system is never an easy process. It is widely acknowledged that companies are increasingly facing different challenges of electronic business (Cagliano, Caniato & Spina 2003). A company has to be aware of the challenges that implementation may include. According to Davila, Gupta and Palmer (2003) implementation of electronic procurement solutions include risks which can be divided in to four categories. They are internal business risks, external business risks, technology risks and electronic procurement process risks.

Internal business risks

Internal business risks mean that companies are uncertain about having right and adequate resources to successfully adopt an e-procurement system. It is extremely important that an e-procurement system fully works with the purchasing process and the system is completely integrated with the existing information infrastructure. If integration between new procurement system and existing infrastructure fails, it creates more workload and harms the reliability of the organization processes. (Davila et al. 2003)

External business risks

It is not enough that e-procurement software only works with the company's internal systems. It also has to be integrated with customers and suppliers solutions. Information exchange between suppliers and enterprise must be real time-based and visible. Electronic collaboration is not possible, unless this external integration fails. Many suppliers will not do anything unless they get guarantees of future profits. (Davila et al. 2003)

Technology risks

This risk group consists of uncertainty of the widely accepted standards and uncertainty of the comprehensive understanding which system solution is best for the company. If the solution is not widely accepted, the integration of e-procurement solution fails in every stage of the supply-chain. If standards are not widely accepted, clear and open, many of the benefits will not be reached. (Davila et al. 2003)

Electronic procurement process risks

Implementation of electronic procurement software has to be a secure and systematic process. Business activities and production cannot be interrupted when integration is in action. If the integration process fails, it can cause serious damages to the company's business and its functions. (Davila et al. 2003)

3. Research process

This chapter describes how this research was done. The research process consists of timetable, material collecting and processing, material analyzing and thesis reliability and validity.

3.1 Timetable

This bachelor's thesis project started in July 2009 as a result of the possibility to cooperate with the case company. The case company had a need to clarify all of those effects that an implementation of an electronic procurement system would create to them and their business activities. The topic of the thesis was decided and accepted in September 2009.

The thesis was written from October 2009 to December 2009. At first, In October, researcher introduced himself to earlier studies concerning the topic of the thesis.

The writing process started after the literature overview. Theory and methodology was written first. Researcher tried to create a comprehensive theory overview to which the empirical part of the thesis would be simple to join. Empirical part, research process and conclusions of the thesis were written in November 2009. This thesis followed the original research plan and it was finished in the beginning of December 2009.

3.2 Collecting and processing the material

Research material was collected in two different ways. First, researcher created a theoretical context which was the base of the whole thesis. All written material was collected from books and academic articles. Researcher read articles and picked up all relevant material. The relevant material finally created the right direction and theoretical context to the thesis. All written material was processed through the research problem which meant that material was accepted to be a source of the thesis if it was relevant to the topic. Key words, in processing written material, were purchasing, electronic procurement and implementation.

The empirical material was collected through interviews. Researcher interviewed seven people from the case company via email. All answers were processed and analyzed and researcher tried to find the most relevant things to be able to create a holistic view. Researcher compared the empirical material to the theoretical context and connected these parts to a one big picture. Processing empirical material was challenging because researcher had to translate all answers to English. Researcher had to be accurate and careful in translating empirical material to English, because the significance of the answers was not allowed to change.

3.3 Analyzing the material

First, researcher collected a lot of written material. All the material was accurately analyzed and only most important sources were picked up for the thesis. Based on these chosen sources, researcher wrote theoretical context of the thesis.

Empirical material was analyzed all the time during the writing process. Researcher analyzed empirical material through two different perspectives: management perspective and employee perspective. These perspectives were compared during the empirical analyze and writing process. Researcher read the material all the time during the writing process, and translated all answers into English. After the translation process answers were divided in to two groups according to the two perspectives researcher used in the analysis. The meaning of the empirical analyze was to recognize those benefits and problems that an e-procurement system implementation would create to case company and to combine the answers to a one text.

3.4 Thesis reliability and validity

Reliability and validity describe the reliability of research methods. **Validity** means that the researcher has examined those factors that he has promised to explore in the thesis. **Reliability** describes how repeatable the research results are. These concepts are an important part of the qualitative research even if these concepts have faced criticism about the argument that these concepts are only suitable in the environment of quantitative research. (Tuomi & Sarajärvi, 2002, 133)

Research evaluation is based on credibility, transferability, dependability and confirmability. These are the criterions of the evaluation of the reliability. Several things should be noticed during the reliability evaluation process:

- *The object and the meaning of the research,*
- *Researcher's own covenants towards the research,*
- *Material collecting,*
- *Interviewees of the research,*
- *How the relationships between researcher and interviewees works and how the relationships impacts on the research,*
- *Duration of the research,*

- *Analyzing material and reporting about the thesis.*

(Tuomi & Sarajärvi, 2002, 135,138)

The reliability of this thesis is guaranteed by precise reporting about the thesis and by decisions that the researcher has done concerning research selections. The validity of this thesis is guaranteed by relevant research material and material analyzing and processing.

4. Research results

This chapter describes on research results. Research results include benefits and challenges that implementation of an electronic procurement system would bring to case company. Some of the words in this chapter are highlighted because the researcher has tried to emphasize those processes and functions to which the recognized benefits and challenges are directed to in the case company.

4.1 Research material

Research material consists of seven interviews with the employees of the case company. Four of these interviewees are managers and three are employees of the purchasing department. The meaning of the interviews was to clarify what kind of positive and negative effects implementation of an electronic procurement system would cause to the case company's business activities. Researcher wanted to bring forth, how opinions between managers and employees differ from each other. Collected empirical material was enough to show the significance of an e-procurement system to case company.

4.2 The current situation of procurement of the case company

At the moment, case company is in a situation where purchasing practices are changing rapidly and radically. Traditional purchasing procedures are ineffective and produce a lot of costs to company. Managers see current procurement situation as a phase where implementation of an electronic procurement is accepted by the organization, and transition process from old practices to a new automated system has begun. Before, every department inside the organization had been independently able to decide about their own purchases. The only limit was the budget given to each department inside the company. Purchase orders and invoices were handled manually, which meant that processes were slow and ineffective.

One manager described the inflexibility and inefficiency of the company's current procurement by saying:

"Upfront acceptance of purchases is insufficient and controlling is very difficult. Reportage of procurement and procurement efficiency is negligible." (Manager 2)

"Purchasing instructions are unclear, and system consist a lot of invoices which do not have purchase orders." (Manager 2)

At the moment, new purchasing department is founded and electronic procurement system is in acquisition phase, which means that new purchasing routines are soon taking place in purchasing actions. Situation is new to everyone and it takes time before the process begins to work. One manager notes:

"Purchasing department is founded but it is still in its early phases. This means that responsibilities and processes need to be re-recognized and directed better than before." (Manager 1)

Employees' opinions about case company's current procurement situation do not differ much from managers opinions. Employees think that current situation is ineffective and frustrating. Manually handled processes are taking a lot of valuable

time and current tendering systems are inflexible. Without an electronic procurement system, working is slow and complex. Before founding the new purchasing department there was multiple persons inside the organization who were allowed to buy almost whatever they wanted. There was no tendering between suppliers. This kind of situation caused enormous costs and extra work. Circumstances were unbearable and founding completely new purchasing department was the only way to fix the situation. Even the purchasing department now exists, operations are still slow and purchasing processes are handled with telephone and email. The amount of purchase requests is huge and that is the reason why purchase actions get jammed sometimes. However, new purchasing routines do not work until the electronic procurement system is adopted.

Interviewees had positive feelings towards new electronic procurement system. All interviewed managers and employees believed that implementation of an electronic procurement system is the key solution to make purchasing operations effective and to reduce purchasing costs. Here are few answers to the question *what kind of attitudes you have towards implementation of an electronic procurement system?*

“Electronic procurement system is the only way to move forward. Current manual process demands too much work and is open to multiple mistakes.” (Manager 3)

“I have very positive feelings towards this new system. We have been waiting for this system for a long time.” (Manager 1)

“It would be great if this electronic procurement system is adopted. It would make our work easier and faster” (Employee 2)

“I have very positive feelings towards this system and I hope this system is implemented as soon as possible.” (Employee 3)

These comments show that the need of a systematic procurement system is real and crucial. The current procedures of procurement are not the best ways to operate. Traditional purchasing practices have to be changed and these changes need to be realized as soon as possible.

4.3 Benefits of an electronic procurement system to the case company

Compared to the company's earlier purchasing operations, the new electronic procurement system has a lot of positive effects to business and procurement. Managers recognized several factors which implementation of an e-procurement system fixes and makes more efficient. These recognized factors are: reporting, centralized purchasing, transparency of purchasing and costs, corporate-wide cost category control, budget overdraft control and reducing mistakes and manual work.

Reporting

With the help of an electronic procurement system, it is possible to report all purchases of the period and biggest suppliers. Efficient reportage improves monthly reporting and gives valuable information to the financial statements.

Centralized purchasing

Procurement system includes information about previous purchases, supplier data, contracts and price information. All the information can be found behind one system which makes purchasing more efficient.

Transparency of purchasing and costs

Procurement system makes it possible to examine all the costs and purchases of the whole corporation. This helps controllers to build a wide picture of cost and purchase structure.

Corporate-wide cost category control

“Implementation of an electronic procurement system forces organization to define persons who are in response of categories. This automatically leads to corporate-wide cost category control.” (Manager 2)

Budget overdraft control

Electronic procurement system has alarms for budget overdrafts. If budget goes over, system alarms and single purchases can be cancelled. This means better control in purchasing.

Reduced mistakes and manual work

An electronic procurement system automates procurement process. This means less mistakes and manual work. System automatically registers purchasing transactions so nobody needs to register it manually.

Employees also recognized several benefits but their opinions were more practical than managers' opinions. This can be explained through the fact that all interviewed employees worked as buyers in the case company so they handle purchases every day in practice. Researcher found it interesting for having two different perspectives to the question: “what are the benefits that an implementation of an electronic procurement system offers to your company?” Managers' answers were more operational and strategic, and employees instead told more about e-procurement system benefits in practice. Employees described the benefits of an e-procurement system as following:

“New system is faster and automatized and it offers better possibilities in searching and comparing suppliers.” (Employee 1)

“I think new system would make our work faster and we can also save lots of money and time.” (Employee 2)

Employees also believed that new electronic procurement system makes it possible to fully control different product items. Electronic procurement system offers better follow-up of deliveries and raises effectiveness of operative purchasing. Next figure describes what the effectiveness of operative purchasing means:

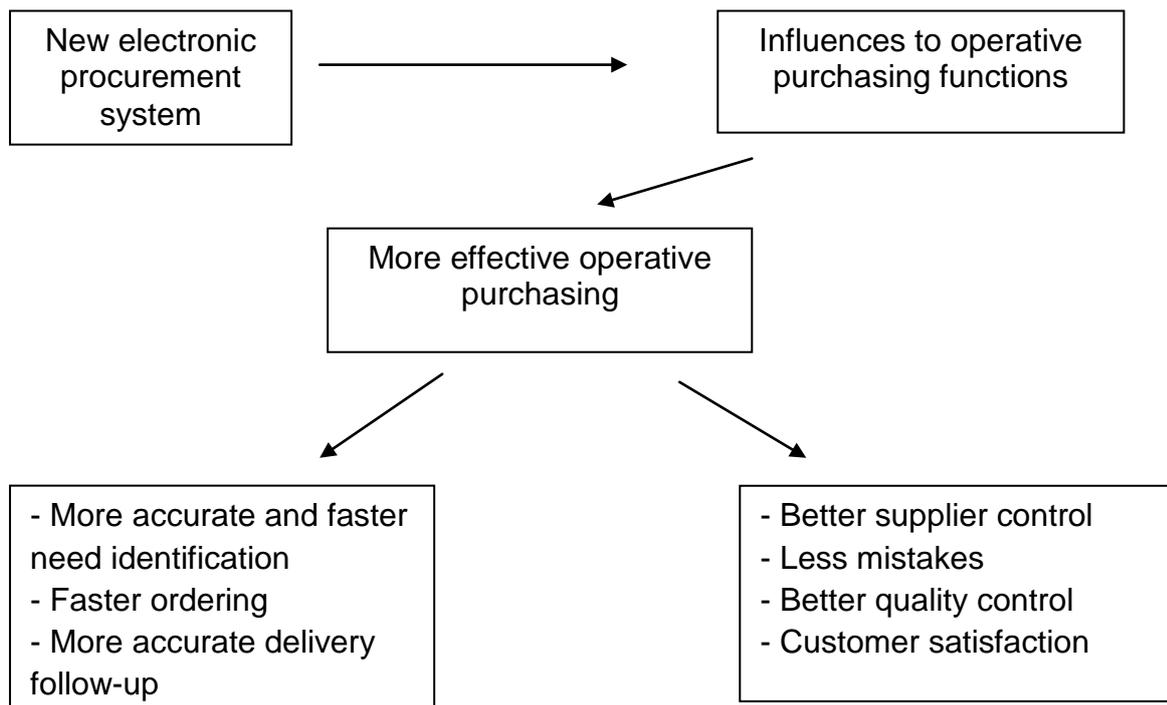


Figure 5. Electronic procurement system influences to operative purchasing

Interviews of managers and employees reveal that recognized benefits are directed to processes and functions important to procurement as a whole. Benefits of an electronic procurement system can be seen in **procurement process**. Buyers are able to follow and control their purchases in real time. Procurement system becomes more simplified and unnecessary phases can be eliminated. Benefits are also directed to **invoice handling process**. This means that manual work is minimized and invoices are handled automatically by the procurement system. **Data filing** becomes faster and automatized and **comparison of purchase orders and invoices** becomes much easier than before. One of the employees had a good answer to the question: “To which functions and processes the recognized benefits

are directed to?” He emphasized that purchasing as a whole is the most important thing by saying:

“Benefits are directed to the purchasing as a whole. Every work stage becomes faster and the whole purchasing process becomes flexible.” (Employee 2)

The link between empirical research material and theoretical context of this thesis is obvious. Case company's recognized benefits are similar with earlier studies. Academic literature concerning electronic procurement and its benefits to business, supports those factors been recognized through interviews. For example, earlier studies (Subramaniam & Shaw (2004), Croom & Johnston (2003), Puschmann & Alt (2005), Teo & Lai (2009), Morrison (2009)) found that cost savings, supplier management and process and function efficiency are very common benefits that implementation of an e-procurement system offers to business. Interviewees emphasized similar factors in their answers during the interviews so it can be said that these factors are very important part of increasing the efficiency of purchasing operations.

4.4 Electronic procurement system challenges to the case company

Implementation of an electronic procurement system is a challenging way to make businesses more profitable. Companies have to be aware of implementation challenges because without thorough preparation these challenges may occur quickly, and the whole implementation process may fail. Relating to these challenges, interviewees were asked to answer the following questions: *“What are the challenges of an e-procurement system implementation?”* and *“To which processes and functions these challenges are directed to?”* Managers had concerns about following things: system functionality, integration between other systems and businesses, system education resources, defining responsibilities, and system administrator problem.

System functionality

The company has to prepare to the situation where the new electronic procurement system does not work like it is planned to. There are multiple things that need to be noticed before, during, and after the implementation process.

Integration to other systems, processes, and functions

Integration is one of the main concerns in implementation of a new system or software. Failed integration costs massive costs and extra workloads. Worst case scenario is that the whole implementation process fails because new and old systems do not discuss with each other.

Educational resources

New systems demand education and learning. This means that the whole organization and employees need to be trained to use the new electronic procurement software. Education causes costs and demands lots of resources. Some employees learn new things fast and others may need months to learn only the basics of the system.

Defining responsibilities

Managers emphasized that implementation of an e-procurement system demands the definitions of different responsibility questions. Organization must define each roles, users and responsibilities which are connected to the implementation and new procurement system. Defining different data structures is also important, because it helps to decide which things need to be reported.

System administrator problem

Implementation and maintenance of a new system requires system administrator. System administrator is responsible for the whole system and its functionality. Administrator operates as a “helpdesk” who gives answers to different problems concerning the system. Problem is who has the needed knowledge about the system and its procedures.

Employees recognized few more problems which are an important part of the problem recognizing process. One of the employees had concerns about **the transportation of the existing information** from old manual system to a new electronic one. In addition to this, employees were skeptical about **the technical errors** that electronic procurement system may cause. Also the **system deployment costs** are massive which means all actions need to be carefully planned. Founding a new electronic system takes lots of resources in the beginning, because all information concerning products, suppliers and existing data need to be entered to the new system. Risks are mostly directed to the integration process. Links between the procurement system and other financial software need to be perfectly suitable to each other. This requires good planning and maintenance.

5. Conclusions

This paragraph summarizes the whole thesis and its key factors. Researcher considers the thesis as a whole and tries to bring together the most valuable perceptions of the research. Researcher considers the future research possibilities and brings forth ideas for new future researches concerning electronic procurement and electronic procurement systems.

5.1 Thesis as a whole

The meaning of this thesis was to examine the positive and the negative effects that implementation of an electronic procurement system would cause to the case company in a common level. This thesis was a survey of case company's needs. The thesis consisted of the literature overview which purpose was to bring forth what earlier studies had been examined concerning electronic procurement and electronic procurement systems. The empirical part of the thesis was written based on the interviews done in the case company's environment. The empirical part described the case company's current procurement situation and recognized the benefits and challenges of implementation of an e-procurement system. These research results created a base to the future research and defined new research questions for the future examination.

5.2 The key factors of the research results

Most important thing in this research were the recognized implementation benefits and challenges. The case company clearly needs an electronic procurement system because the current situation and existing purchasing operations, strategies and policies are ineffective, inflexible and strain the case company's cost structure in a remarkable way. The new electronic procurement system offers several notable benefits:

- *Faster, more accurate and more effective reporting*
- *Centralized purchases*
- *Purchasing and cost transparency*
- *Corporate-wide cost category control*
- *Budget overdraft alarms*
- *Reduced manual work and mistakes*
- *Automated processes*
- *Delivery control*
- *More effective purchasing processes and functions*

- Supplier control

These benefits are commonly seen in the procurement process, invoice handling process, data filing process, and comparison process of invoices and purchasing orders. Electronic procurement system produces benefits to the purchasing as a whole. The theoretical context of the research supported these recognized benefits.

Implementation always includes challenges of which organizations have to be aware of, so that thorough preparation and protection against these factors is possible. Several challenges are connected to the case company and implementation process of an electronic procurement system:

- System functionality*
- Integration to other systems, processes and functions*
- Educational resources*
- Defining responsibilities*
- System administrator problems*
- Transportation of the existing information*
- Technical errors*
- System deployment costs*

These challenges are mostly directed to the integration process and implementation of e-procurement system. The challenges are capable to cause implementation failures and lots of extra costs if they are not recognized and secured. The case company should also consider about the actions in managing implementation and procurement system challenges.

5.3 Future research possibilities

This thesis opened new possibilities for future researching. The purpose is that researcher continues cooperation with the case company and specifies the research concerning electronic procurement systems in spring 2010. The case company is

about to implement an electronic procurement system no later than autumn 2010. Future research will concentrate on this specific electronic procurement system. Researcher will explore how this new procurement system is able to respond to the benefits and challenges that were recognized in this thesis. Questions concerning the future research are for example: Is this new system able to produce these benefits that are generally recognized as positive effects of implementing an electronic procurement system? What kind of features this new system has in order to fill the needs that the case company has at this moment? If this new specific system is implemented, will all the recognized challenges be minimized or fully eliminated? These questions will be specified when the research comes topical.

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ATTACHMENTS

Attachment1. An interview form used in the thesis.

1. Firstly, would you tell following information about yourself:

Name:

Gender:

Age:

Education:

Position in the company:

Year started in company's service:

2. How would you describe company's current procurement situation?

3. What kind of attitudes you have towards the implementation of an electronic procurement system?

4. Which are the benefits of implementing an electronic procurement system? Describe these benefits.

5. Which are the processes and the functions to which these recognized benefits are directed to? How these benefits appear in these recognized processes and functions?

6. Which are the challenges of implementing an electronic procurement system? Describe these challenges.

7. Which are the processes and the functions to which these recognized challenges are directed to? How these challenges appear in these processes and functions?

8. Anything else that should be noticed during the implementation of an electronic procurement system?

