



LUNDS UNIVERSITET

Lunds Tekniska Högskola

*Department of Industrial management &
Logistics*

Analysis and improvements of information management

-A case study about information management at an SME



A master thesis project

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Preface

This master thesis has been executed at OF Ekeri in Markaryd and has been conducted by Marcus Lindén with supervision by the department of Industrial Management and Logistics, Lund institute of Technology.

This master thesis was performed within a time period of 20 weeks from September 2013 until January 2014. The project is the final part of the Master of Science program and has been achieved with the knowledge I have learned during the 4, 5 years studying at the Faculty of Engineering.

I would like to thank my supervisors Jan Olhager and Fredrick Persson and my examiner Kostas Selviaridis.

Big thanks shall also be given to the rest of the employees at OF Ekeri who have made me feel welcome and been there to answer all my questions. They are Claes Olsson, Bo Olsson, Mia Silvergren, Alf Svensson, Carina Olsson, Arne Persson and Malin Sandström.

Lund, January 2014

Marcus Lindén

Abstract

Title	Analysis and improvements of Information management - <i>A case study of information management at a small/medium Enterprise</i>
Keywords	Information System, ERP (Enterprise Resource Planning), CRM (Customer Relationship Management), WMS (Warehouse Management System), FMIS (Financial Management Information System), Return of Investment (ROI)
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Background	OF Ekeri is a national company with an office in Markaryd. They deliver and rent a wide selection of different types of truck trailers, semitrailers and spare parts. Today almost all companies have some kind of information system and many of them are inefficient. OF Ekeri is aware of that their way of managing their information is not up to date and therefore they have asked for help regarding if it is possible to manage their information systems more effectively which could contribute to savings.
Problem	The problem today is that OF Ekeri does not fully utilizes their information systems which cost money and leads to more work in the end.
Purpose	The purpose is to perform a thorough analysis of OF Ekeri's information management and information flow and make possible and reasonable improvements.
Methodology	In this master thesis the inductive approach has been used. First, OF Ekeri's empirical information was gathered, and based on that, theories were collected and analyses were made. This master thesis has been conducted as a case study. A thorough understanding of the business was created before trying to improve it. Data has been gathered through interviews, observations and literature studies. During the research, emphasis has been on ensuring that reliable and valid data has been used.
Results	Depending on which of the suggested implementations OF Ekeri chooses to do, the improvements of the current Information systems will result in variety of less work hours, optimized working method and major savings.

The suggested investments have a reasonable investment cost relative to the benefits it will generate, a short Return of Investment (ROI) time and they will improve the way of working. They are also realistic for OF Ekeri to implement with regard to both capital and time.

Conclusions

Investing in an ERP system right now is not relevant for OF Ekeri. An ERP system would have been more suitable if OF Ekeri had offices in different locations, had own production of trailers instead of buying them and selling them on and handled larger volume of products and transportations.

The current information systems LIME and Visma and their ability to integrate with each other and other web-based systems simplifies a lot, which makes the current systems good enough for OF Ekeri. Upgrades of their current information systems will generate big savings relative to the implementation cost and generate good results. It will be important for the employees at OF Ekeri to be able to trust the new possible implementations for them to reach the best results.

Sammanfattning

Titel	Analys och förbättring av informationshantering - En fallstudie om informationshantering för ett litet/medelstort företag
Nyckelord	Informations system, ERP (Enterprise Resource Planning), CRM (Customer Relationship Management), WMS (Warehouse Management System), FMIS (Financial Management Information System)
Författare	Marcus Lindén - Master of Science, Maskinteknik
Handledare	Fredrick Persson, Uthyrning och marknadschef, OF Ekeri Jan Olhager, Professor i strategisk produktionslogistik, Institutionen för teknisk ekonomi och logistik, Lunds universitet - Lunds Tekniska
Bakgrund	OF Ekeri är ett nationellt företag med kontor i Markaryd. De levererar och hyr ut ett stort utbud av olika typer av lastbilsläp som till exempel släpvagnar, påhängsvagnar och reservdelar. Nästan alla företag i dag har någon form av informationssystem, men många av dem är ineffektiva. OF Ekeri är medvetna om att deras sätt att hantera deras information inte är uppdaterad och därför de har bett om hjälp. Om det är möjligt att utnyttja deras informationssystem på ett effektivare sätt, kan det bidra med stora besparingar.
Problem	Problemet i dag är att OF Ekeri inte utnyttjar sina informationssystem till sin maximala kapacitet vilket kostar pengar och leder i slutändan till mer arbete.
Syfte	Syftet är att göra en grundlig analys av OF Ekeri's informationshantering och informationsflöde samt möjliggöra och visa utförbara förbättringar.
Metodik	I detta examensarbete har en induktiv metod använts. Först samlades OF Ekeri's empiriska information in, och utifrån den har teorier samlats och analyser gjorts. Detta examensarbete har genomförts som en fallstudie. En grundlig förståelse för verksamheten skapades innan eventuella förbättringar skapades. Data har samlats in genom intervjuer, observationer och litteraturstudier. Under undersökningen har betoningen legat på att se till att tillförlitlig och giltig data har använts.
Resultat	Förbättringar av de nuvarande informationssystemen kommer att resultera i mindre arbetstid, optimering av deras sätt att arbeta på OF Ekeri och

stora besparingar. Vilket resultat man kommer uppnå beror på vilka implementationer OF Ekeri väljer att göra. De rekommenderade investeringarna har en rimlig investeringskostnad i förhållande till de fördelar som de genererar, en kort avkastning på investeringen och de kommer att förbättra sättet att arbeta på. De är också realistiska för OF Ekeri att genomföra med avseende på både kapital och tid.

Slutsats

Att investera i ett större ERP system just nu är inte relevant för OF Ekeri. Ett ERP hade varit mer passande om OF Ekeri hade kontor på olika ställen, hade produktion av släpvagnar istället för att bara köpa dem och sälja dem vidare och om de hanterade större volymer av produkter och transporter.

Informationssystemen LIME och Visma och deras förmåga att integrera med varandra och andra webbaserade system underlättar väldigt mycket, vilket gör de nuvarande systemen tillräckligt bra för OF Ekeri. Uppgraderingarna till deras nuvarande informationssystem kommer generera stora besparingar i förhållande till kostnaderna för genomförandet och de kommer ge bra resultat. Det kommer att vara viktigt för de anställda på OF Ekeri att lita på de nya möjliga implementeringarna för att få dem att nå bästa resultat.

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1 Introduction

This chapter will give a short description about OF Ekeri as a company. The problem background, problem definition, purpose, delimitations and a report outline will also be described in this chapter.

1.1 OF Ekeri

OF Ekeri is a national company with an office in Markaryd. They deliver a wide selection of different types of truck trailers and semitrailers. Chapel trailers, curtain-trailers, swap bodies and container wagons are some examples. They also offer rental of new or used trailers and have a wide selection of spare parts. They collaborate with Ekeri, Tyllis, Kögel and Fokor, which has achieved great success (Fredrick, 2013).

OF Ekeri is a family company that started in the beginning of the 90s and has now become one of Sweden's most credits worthy company. They have received a trippel-A award showing high financial stability and solvency. A big part of their success story is that they work with quality, not only in products but also in human relations (OF Ekeri, 2013).

1.2 Problem Background

Today all companies have some kind of information system, but many of them are inefficient and to a large extent it depends on that companies lack the competence that is necessary to optimize the information management and the information systems.

If it is possible to manage information systems more effectively, it could contribute to savings. OF Ekeri is aware of that their way of managing their information is not up to date and therefore they have asked for help.

There are many different ways to handle this problem, depending on the condition of the company. It can be anything from looking at the information in a different way and smaller system updates to more major changes like new an information system.

1.3 Purpose

The purpose is to analyze the current situation of OF Ekeri's information management and propose possible improvements for the existing information systems, how they can be improved by possible system development and/or working changes. A secondary purpose is to see if it is possible and feasible to integrate the different systems with some kind of ERP system or some less advanced systems.

1.4 Problem Definition

The main problems that OF Ekeri suffer from have been divided in to 3 major questions. These questions are to be answered, and they are:

- How does the information flow look today?
 - How is the information handled?
 - How much time is squandered due to undeveloped information systems?
- Can the existing information systems be improved individually?
 - Maybe system developments?
 - Change their working method?
- Can the existing information systems be integrated?
 - Is it technically feasible?
 - Is it economically feasible?
 - Maybe an Enterprise Resource Planning (ERP) system?

1.5 Delimitation

The main focus will be to answer the first two major questions i.e. how the information flow looks today and how the existing system can be improved individually. That is what OF Ekeri wants to focus on. They want to save time by minor changes because it means less implementations costs.

The possibilities with an ERP system or some less advanced system will also be answered and how it can affect the enterprise information management. The implementation costs will most likely be significantly higher but OF Ekeri will be presented with the potential benefits of an ERP system, if it is necessary and possible to implement without major changes to the existing systems.

1.6 Report Outline

Chapter 1 - Introduction

This chapter gives a short description about OF Ekeri as a company. The problem background, problem definition, objective, proposes, delimitations and a report outline will also be described in this chapter.

Chapter 2 – Methodology

This chapter will describe how the master thesis is organized. That includes approach, use of different data collection methods, different methods of analysis and credibility.

Chapter 3 - Theoretical framework

This chapter will present the theoretical framework needed to understand this master thesis is presented to the reader.

Chapter 4- Empirics

In this chapter the collected data about OF Ekeri's current situation will be presented. It will contain information about their current information systems and how the information flow of their different departments looks like.

Chapter 5 – Analysis and Improvement Proposals

This chapter analyzes the empiric data, and areas with improvement potential will be distinguished and analyzed further. Additionally, concrete suggestions of improvements that where made based on the analysis will be presented.

Chapter 6 –Implementations and Results

This chapter will give examples of possible and feasible implementations based on the improvement proposals and the problems mentioned in chapter 1.4 Problem Definition. The results of the different implementations will be presented

Chapter 7 – Conclusions and discussion

The chapter contains conclusions of the research and a discussion around some different aspects and assumptions.

2 Methodology

This chapter will describe the methodology which this master thesis is based on, i.e., how it is organized. That includes practical and scientific approach, research method, use of different data collection methods, credibility and practical approach.

2.1 Scientific Approach

Deductive and *inductive* are the two major approaches that can be used as methods of reasoning throughout a master thesis. An approach going back and forth between the two above-mentioned theories is called abduction (Björklund, M., & Paulsson, U., 2003)

The *deductive* approach starts with a model, theory and predictions. Next is to gather empirical data to test the predictions and then use the new information to conclude whether or not they were correct (Björklund, M., & Paulsson, U., 2003). The *inductive* approach is the opposite of deductive. Instead of starting with gathering theory, all empirical information is collected and based on that, models and theories are created. (Björklund, M., & Paulsson, U., 2003)

In this master thesis the inductive approach has been used. First, OF Ekeri's empirical information were gathered, and based on that, theories were collected and analyses were made.

2.2 Research Method

This master thesis has been conducted as a case study and the study will be further explained in this chapter.

A case study is appropriate when a purpose of a project is to obtain a deeper understanding of an object or phenomenon, like reveal areas in need of research within the organization (Höst, et al., 2006). The strategy of a study is flexible which means that it is possible to change questions and direction during the study. Interviews, observations as well as literature studies are common to use when gathering information when performing a case study (Höst, et al., 2006). These tools can provide a deeper understanding than just using statistical analysis of questionnaires.

2.3 Gathering Data

There are two different data collection approaches to choose between during a project. They are called *quantitative* and *qualitative* and it is mainly the purpose of the master thesis that determines which one to choose. (Björklund, M., & Paulsson, U., 2003)

The *quantitative* approach includes information that can be measured or evaluated numerically, such as amounts, proportions, times etc. Quantitative data can be processed by using surveys and mathematical models which gives a more detailed information (Höst, et al., 2006). The *qualitative* approach is used when a deeper understanding of the study is the main focus. Observations and interviews are two examples of how the qualitative data can be gathered (Björklund, M., & Paulsson, U., 2003).

Depending on what kind of information that is collected, data can be divided into two different groups, *primary data* and *secondary data*. Primary data is collected to be used in the current study and secondary data is data collected for a purpose other than the current study (Björklund, M., & Paulsson, U., 2003).

For this master thesis the qualitative approach has been used. Observation, interviews and literature study are the methods that have been used to get a deeper understanding of OF Ekeri's current situation. The three alternatives will be further explained.

Observations

Observation is a time-consuming method but it can generate more relevant and objective information. It can be done in many different ways which makes it hard to describe the strengths and weaknesses about this research method (Björklund, M., & Paulsson, U., 2003).

There are different techniques on how to practice different observations. The observer can either participate in the studied event or not. If participating, a greater knowledge and trust for what is being observed is created, but it might lead to lost objectiveness. The opposite could lead to more objectiveness but it can also lead to less understanding about the observed event. There is also an option for the observers to tell the observed personal that they are being observed. This depends on the situation. If the personal is aware that they are being observed they might start to act unusual, but not letting them know can raise ethical issues (Höst, et al., 2006).

Interviews

Interviews are different ways of hearing and can be executed in many different ways. It can be carried out through personal contact, by telephone or conversations by e-mail and text messages. Through interview preliminary data is received (Björklund, M., & Paulsson, U., 2003).

Every interview can have different outlines, and they are often divided into three different types. They are; structured, semi-structured and unstructured. If the questions are predefined and carried out in a specific order, it is a structured interview. In a semi-structured interview some questions are pre-defined and some of them are open questions that are asked based on the answers from the respondent. An unstructured interview is

when it is more of a discussion between the persons involved (Björklund, M., & Paulsson, U., 2003).

The unstructured outline has been used during this master thesis. The empiric data has been gathered through discussions with the employees.

Literature study

It is important that the project has a stable scientific base, and therefore it is important that a literature study is conducted. It will also help the researcher to get more knowledge about the subject and thus avoiding mistakes (Höst, et al., 2006).

Björklund and Paulsson (2003) states that all types of written and diverse materials are literature; it can be books, brochures or magazines. The information gathered from a literature study is secondary data, which makes it very important to make sure that the information recited is not distorted or comprehensive.

2.4 Credibility

It is important that drawn conclusions from the research are well authenticated and that the right subject has been studied. Björklund and Paulsson (2003) states that *validity*, *reliability* and *objectivity* are three major aspects to consider when measuring the credibility of a research project.

The decisions and assumptions in this project have been done with a continuous goal of maintaining the credibility. Data collected during interviews and observations has been discussed and confirmed with relevant personnel for the same reason.

2.4.1 Validity

Validity is defined as "to what extent something really measures what it intends to measure" (Björklund, M., & Paulsson, U., 2003).

There are different techniques that can be used to increase the validity and one of them is triangulation. This means to investigate the same phenomenon to obtain multiple perspectives about the question at hand. There are different types of *triangulation*, some examples are (Björklund, M., & Paulsson, U., 2003):

- *Method triangulation*: Using different methods.
- *Theoretical triangulation*: Using different theories on the same set of data.
- *Data triangulation*: Using multiple data sources.

This master thesis is based on qualitative data, which is data based on observation and interviews. Due to that, data triangulation and theoretical triangulation has been used to while analyzing the gathered data to increase the validation.

2.4.2 Reliability

Reliability is defined as “the degree of reliability of the instrument, i.e. the extent to which the same value occur if you repeat the survey” (Björklund, M., & Paulsson, U., 2003).

It is very important that the gathered data and analyses are of high reliability. This can be done by being very thorough throughout the whole project. Other minor alternatives can be to use control questions during interviews and to involve and obtain coworkers opinions (Björklund, M., & Paulsson, U., 2003) (Höst, et al., 2006).

There has been a close collaboration with OF Ekeri throughout the whole project. The coworkers have been involved and discussed the gathered data to make sure that the empirical data is correct which has increased the reliability.

2.4.3 Objectivity

Objectivity is defined as “to which extent does values influence the study” (Björklund, M., & Paulsson, U., 2003).

It is important to make sure that own values not are presented in the project. A way to increase the objectivity is to render the source as objectively as possible. That means; not manipulate facts, not choose the fact and arguments that yourself advocate and avoidance of sensitive word.

All interviews and observations were carried out with a neutral approach and all choices were well reasoned. It is therefore considered that the report has a high level of objectivity.

2.5 Practical Approach

In Figure 1 it is possible to see the first draft of the time plan. As can be seen, the inductive approach has been used. OF Ekeri’s empirical information were gathered and based on that, theories were collected and analyses were made. The time plan is not 100 percent and some changes were made but it in general the master thesis was carried out according to this schedule. Each step will be briefly explained further down in this chapter. Worth mentioning is that this time plan do not include the two week long methodology course taken in the beginning of the master thesis.

ID	Task Name	Start	Finish	Duration	sep 2013			okt 2013				nov 2013				dec 2013				jan 2014			
					8-9	15-9	22-9	29-9	6-10	13-10	20-10	27-10	3-11	10-11	17-11	24-11	1-12	8-12	15-12	22-12	29-12	5-1	12-1
1	Introduction meeting with OF Ekeri	2013-09-09	2013-09-11	,6w	■																		
2	Write Introduction/Methodology	2013-09-12	2013-09-20	1,4w	■	■																	
3	Data Collection/Learn the systems	2013-09-23	2013-10-18	4w			■	■	■														
4	Empiric data collection	2013-10-14	2013-11-01	3w				■	■	■													
5	Literature study	2013-11-04	2013-11-22	3w						■	■	■											
6	Analyses and improvements	2013-11-25	2013-12-20	4w									■	■	■	■							
7	Implementation and results	2013-12-23	2014-01-03	2w														■	■				
8	Discussion and conclusions	2014-01-06	2014-01-10	1w																	■		
9	Report writing	2013-09-09	2014-01-24	20w	■																		
10	Collaboration with OF Ekeri and LTH	2013-09-09	2014-01-24	20w	■																		

Figure 1: The project process

1. First step was the meeting with the representatives from OF Ekeri. The problem background, problem definition, purpose and delimitations where discussed and decided. To be able to achieve the desired outcome, the initial step was to define and understand the problem and objective.
- 2/3. After writing the introduction and methodology it was time for the empirical research. This was done through observation and interviews.
- 4/5. After the empirical data were gathered and consolidated, literature studies where made and different theories were collected.
6. Based on the collected information and knowledge gathered during the data gathering and during the analysis of the empirical data, possible improvements alternative were made
7. Possible and feasible implementations based on the improvement proposals were then created and concrete results where concluded.
8. The results of the research were then discussed and the best conclusions were completed.

Milestones

This master thesis will have four major milestones and they are:

- Complete data collection
- Complete empiric data collection
- Conclusions and discussions
- Presentation

3 Theoretical framework

In this chapter the theoretical framework is presented. Here the reader will be able to take advantage of previous work and research in the field. This chapter will explain the kind of information systems that OF Ekeri currently have and which ones have been considered for OF Ekeri.

3.1 Introduction

An information system is a combination of information technology resources (including communication networks, hardware, IT applications, and standards for data transmission) and human skills and experiences which helps managing the processes through the organization.

The information system allows all the actors in the supply chain to communicate amongst each other. The use of IT allows suppliers, manufacturers, distributors, retailers and customers to reduce lead time, paperwork and other unnecessary activities (Williamson et al., 2004). Other benefits within the supply chain are that the information flow will become more coordinated, access to information and data interchange, improved customer and supplier relationships and inventory management not only at the national level but also internationally (Quesada et al., 2012).

There are success measures for an information system that falls into six major categories. They are system quality, information quality, use, user satisfaction, individual impact and organizational impact. (Delone H. William & McLean R. Ephraim, 2003)

Using an information system enhances the business efficiency and effectiveness. This is done by reassessing the company's internal business operations such as purchasing, warehousing, materials management and distribution which takes enormous amount of time and financial resources. Companies strive to make those processes more effective in order to improve their financial and market position, and that can be done with different information systems. (Williamson et al., 2004)

All information systems have risks, high implementation- and education costs, maintenance and implementation time as common disadvantages (Umble et al., 2002; Patton et al., 2009; King F. S. & Burgess F. T., 2007; Diamond, J. & Khemani, P., 2006; Magnusson, J. & Olsson, B., 2005), but it is very important to remember that those disadvantages often are proportionate to the investment size. Some general advantages for information systems are for less lead time, more effective processes, better control, reduced operating costs and increased data quality (Magnusson, J. & Olsson, B., 2005). More advantages for each different information system will be explained further in the next upcoming chapters.

3.2 Critical Success Factors

Implementing an information system is not an inexpensive and risk free process. Therefore it is very important to get it right from the beginning. There are a lot of critical success factors that have been identified. Some examples of the major ones are commitment by top management (1), a great implementation team (2), data accuracy (3), extensive education and training (4) and focused performance measures (5) (Umble et al., 2002; Patton et al., 2009; King F. S. & Burgess F. T., 2007; Diamond, J. & Khemani, P., 2006).

1. For a successful information system it is important to get high commitment by top management. When implementing the system it is essential to have strong leadership, commitment and participation. (Umble et al., 2002; Patton et al., 2009; King F. S. & Burgess F. T., 2007; Diamond, J. & Khemani, P., 2006).
2. It is very important to have a great implementation team with high skilled people who know everything there is to know about the information system. The implementation team is very critical when creating an optimal information system to integrate with a company's internal information from a financial perspective (Umble et al., 2002; Patton et al., 2009; King F. S. & Burgess F. T., 2007; Diamond, J. & Khemani, P., 2006).
3. Data accuracy is of course a critical factor because of the integrated nature of an information system, if the wrong data is entered, the risk for a negative domino effect throughout the entire system can and probably will occur (Umble et al., 2002; Patton et al., 2009; King F. S. & Burgess F. T., 2007; Diamond, J. & Khemani, P., 2006).
4. It is also essential that the employees do not try to work around the new system by using the old one. To reinforce this commitment, all old and expired systems must be eliminated and an extensive education and training should be done. If the employees do not fully understand how the system works they will invent their own process using parts of the system. (Umble et al., 2002; Patton et al., 2009; King F. S. & Burgess F. T., 2007; Diamond, J. & Khemani, P., 2006).
5. The focused performance measures must be carefully constructed. The measurement should show how the system is performing and the measures should be designed to encourage the desired behaviors by all functions and individuals. (Umble et al., 2002; Patton et al., 2009; King F. S. & Burgess F. T., 2007; Diamond, J. & Khemani, P., 2006).

3.3 Enterprise Resource Planning System

The Enterprise Resource Planning System (ERP) is a system for integrating internal business data and processes. The main functions with the ERP system are that the system applies for such use that it can cover all the basic functions for the enterprise.

Examples of common functions that the ERP system consists of are Financial Management (FMIS), Supply Chain Management (SCM), Human Resource Management (HRM), Customer Relationship Management (CRM), Warehouse Management (WMS) etc. see Figure 2. It helps the business process to be more flexible and responsive by breaking barriers and optimizing the system. The ERP system promise seamless integration of the financial and accounting information, human resource information, supply chain information and customer information (Chang et al., 2008; Umble et al., 2002).

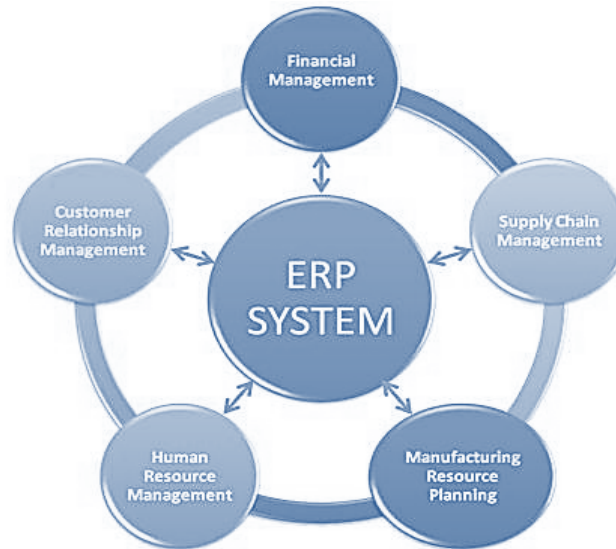


Figure 2: Enterprise Resource Planning System

Examples of financial functions that are supported by an ERP System are asset accounting, cash management and forecasting, financial consolidation, general ledger, product-cost accounting, profitability analysis and standard and period-related costs. Examples of the operations and logistic functions are inventory management, material management, production planning, project management, purchasing, quality management and shipping. Examples of the human resources functions are human-resource time accounting, payroll, personnel planning and travel expenses. Examples of the sales and marketing functions are order management, pricing, sales management and sales planning (Umble et al., 2002).

Once the ERP is installed, the system will reduce the cost of operations. The work efficiency at the company will increase by smoothly integrating its various divisions. It helps the reduction of paper work and provides an online format for quick storage and retrieval of information. By providing each department with their own computer system, data and database, the productivity at the company will increase (Chuang, M.-L. & Shaw, W. H, 2008).

There are a lot of benefits by implementing an ERP system. Major benefits are increased cost-effectiveness, reduced inventory level, reduced logistics cost, order fulfillment and replenishments, enhanced work efficiency due to improved responsiveness to customers and standardization of computing platforms, integration of business functions, improved

international operations through global sharing of information (Chuang, M.-L. & Shaw, W. H, 2008; Umble et al., 2002).

3.4 Warehouse Management System

Warehouse Management System (WMS) is a software based information system. The improvements of a WMS are great and it has become much more flexible and effective and handles a lot more information (Faber et al., 2002).

Today the main functions of a WMS are that the system applies for such use that it covers the functions for the warehouse. The WMS provides the information necessary to manage and control the flow of products in a warehouse, from receiving to shipping. Since a WMS is a node in the flow of products affected by other business functions, the WMS must communicate with other information systems concerning procurement, production control, transportation and finance for example. These systems are integrated in a single comprehensive ERP system, explained in the chapter above (Faber et al., 2002; Piasecki, D., 2004).



Figure 3: Warehouse Management System

Some examples of what WMS controls are the movement and storage of materials within a warehouse and process related transactions like shipping, receiving, put away and picking, see Figure 3, (Faber et al., 2002). A WMS can be divided into three different classifications; Basic, Advanced and Complex.

The Basic WMS is simple and focuses mainly on throughput. It supports the stock and location control. Using for example scanning systems, the WMS determine the location where to store the received goods and register its information. The system also generates storing and picking instructions (Faber et al., 2002).

The Advanced WMS focuses on throughput, stock and capacity analysis. In addition to the basic system, it offers functions like being able to plan resources and activities to synchronize the flow of goods in the warehouse (Faber et al., 2002).

The Complex WMS offers the functions of the advanced system but also transportation planning, dock door planning, value added logistics planning and sometimes simulations. The system has for example information about where the products are (track and trace), where it is going and why (planning, execution and control). This is accomplished by using different technical systems like AS/RS, sorter, AGV, RF robots and data collection systems that are integrated with the WMS system (Faber et al., 2002).

There are quite a few benefits with a WMS. One of the greatest benefits with the WMS is increased inventory accuracy and efficiency. This is because the WMS optimizes the use of warehouse space. This leads to a more consistent flow of all the processes in the warehouse like receiving, put-away, assembly, packing and shipping. The WMS can organize pick requirements in optimal paths and then automatically direct them to the right storage location (Faber et al., 2002; Piasecki, D., 2004).

Other benefits are less administration cost because of the reduced paperwork, reduced inventory, increased storage capacity and reduced labor costs due to higher efficiency. The WMS also generates higher customer service because standardizing all operations leads to that the company can focus on providing customers a more accurate timeline on product availability and delivery for example (Piasecki D., 2004).

3.5 Customer Relationship Management System

The Customer Relationship Management Systems (CRM) goals are, through a continuous process, strengthen relationships with current and potential customers and thus achieves a higher profitability for the organization. The CRM system can help companies manage customer information throughout the organization (Parvatiyar, A. & Sheth N. J., 2001).

Payne A. and Frow P, (2005) define the customer relationship management system as “CRM is a strategic approach that is concerned with creating improved shareholder value through the development of appropriate relationships with key customers and customer segments. CRM unites the potential of relationship marketing strategies and IT to create profitable, long-term relationships with customers and other key stakeholders. CRM provides enhanced opportunities to use data and information to both understand customers and create value with them. This requires a cross-functional integration of processes, people, operations, and marketing capabilities that is enabled through information, technology, and application”.



Figure 4: Customer Relationship Management Systems

Figure 4 gives an overview of different areas a CRM system can cover and facilitate; they are support, sales, operations, marketing, information technology and customer service. A CRM system improves sales performance by allowing employees for example track and share opportunities and coordinate activities across teams. Improve customer support by tracking the customer cases, manage product problems, respond to customer inquiries and share customer service information across the entire organization. A CRM system improves marketing because it allows companies to develop, launch, track campaigns and other marketing offers to customers. The operations is affected because the system offers employee communications by integrating calendars, shared tasks, documents and product information (Chen J I. & Popovich K., 2003).

There are quite a few benefits with a CRM system. The CRM system contains data that allows the organization to focus time and recourses on its most profitable customers which Increase customer loyalty. More effective marketing is created by having access to more detailed data through the CRM system, more targeted campaigns and tracking of campaign effectiveness. The data can be analyzed and that makes it possible to discover which element of a marketing campaign has the greatest impact on sales and therefore profitability. More accurately and updated information improves customer service and support and that is achieved with a CRM system.

A CRM system also generates greater efficiency and costs reductions by integrating customer data into a single database which allows marketing teams, sales force and other departments within a company to share information and work towards common corporative objectives using the same underlying information (Swift R., 2001).

3.6 Financial Management Information System

A Financial Management information systems (FMIS) gather and analyze financial data in order to make good financial management decisions when running a business. The most basic function of the FMIS is to make sure that the firm's financial obligations is handled as they come, using the minimal amount of resources and with an established margin of safety (Diamond, J. & Khemani, P., 2006).

A FMIS is a management tool. It increases the company's safety, flexibility and it decreases the administration labor. Its role is to connect, gather, process and then provide information to all users using the system on a continuous basis (Diamond, J. & Khemani, P., 2006). A FMIS consist of several elements with different functions. It can handle for example general ledger, budgetary accounting, budget development, payroll system, value added tax, counseling, billing, tax returns, financial statements and annual report, see Figure 5.



Figure 5: Financial Management information systems

A FMIS offer a lot of benefits. It generates better control and an overview on the financial information and data, support automation and integration of public financial management processes including budget formulation, execution (e.g. commitment control, cash/debt management, and treasury operations), accounting, and reporting. Flexibility of reporting and additional control over expenditure and less administration is required within the business.

3.7 Inventory Management Software

Inventory Management Software is a computer-based system for tracking inventory levels, orders, sales and deliveries. Inventory management software enables all aspects of

inventory much easier to manage, allowing higher efficiency and reducing time and financial costs.

Inventory management software is used for different purposes, some examples are; maintaining a balance between too much and too little inventory, tracking inventory as it is transported between locations, receiving items into a warehouse or another location, picking, packing and shipping items from a warehouse, keeping track of product sales and inventory levels, cutting down on product obsolescence and spoilage. (Piasecki, D., 2010)

Using inventory management software can lead to eliminate excess inventory and reduce working capital tied up in stock, improve customer service level and automate inventory planning and replenishment. (Syncron, 2013)

The benefits of inventory management are increased profitability because of forecasting, accuracy improvements, time savings and quick access to current and historical pricing. Increased cash flow due to purchasing the correct inventory in the right amount to meet customer demand, while eliminating slow-moving, obsolete inventory leads to higher profits and better cash flow. Improved decision-making due to rapid, accurate data collection enables access to real-time business intelligence across all areas of your company.

Increased customer satisfaction because responding to trends, seasonality, promotions and changing marketing conditions results in having the right products in stock for customers, properly identified products available to ship enables customers to order and receive the correct items quickly and customer service tools integrated within an inventory managements equips the entire company to deliver consistent, personalized care for your customers (ACctivate, 2013).

4 Empirical Data

This chapter will give a general overview of OF Ekeri's current information systems and how the present information flow in their different departments looks.

4.1 Introduction

As mentioned in chapter 1.1 OF Ekeri, OF Ekeri purchases different types of new or used truck trailers and semitrailers like chapel cabinets, curtain-trailers, swap bodies and container wagons are some examples and spare parts. They can be divided into two main categories of products. The spare parts are retail products that are put into stock and the trailers are make-to-order (MTO) products.

Chapter 1.1 OF Ekeri also mentions that the amount of suppliers the company has is small. OF Ekeri have four major suppliers who deliver new trailers and spare parts. The used trailers are bought from suppliers all over Sweden.

The relationship with Ekeri in Finland is very close and the company is heavily dependent on them. The dependence is however mutual since OF Ekeri is the suppliers' largest customer (Claes, 2013). OF Ekeri's turnover is around 180 million a year and Ekeri in Finland accounts for approximately 80 percent of that. Fokor, Tyllis, Kögel and used items accounts for around 10 percent and rental accounts for around 10 percent (Claes, 2013).

4.2 OF Ekeri's current information systems

This chapter will describe the current information systems that OF Ekeri uses. How and when they are used will be explained in chapter 5.3 Information Flow.

4.2.1 CRM (LIME Pro)

OF Ekeri uses LIME Pro and is one of three different CRM-systems that Lundalogik Offers. With LIME Pro full control is accomplished of everything within the organization that is linked to customer care, sales support, case management and member management. Those are examples of what the CRM system is used for. It is extremely flexible and it can handle complex requirements; it can be used by everything from small companies with few users to large corporations with hundreds of simultaneous users. (Lundalogik, 2013)

The interface is flexible, stylish and user friendly. Both form and function has the possibility to adapt and grow with the needs of the company. LIME Pro is built to make sure the information you need always is in the right place (Lundalogik, 2013).

LIME can satisfy the company in many different ways as long as it is used to its maximum potential. Some examples that can improve the CRM system are smart additions like LIME

extranet, LIME maps and LIME web service or just improving the integration between different systems (Lundalogik, 2013).

4.2.2 FMIS and WMS (Visma)

OF Ekeri uses Visma Administration 2000 and it is used as a FMIS and a WMS system. With Visma it is possible to get effective management of orders and inventory and flexible accounting and billing as long as it is used to its maximum potential (Visma, 2013).

Visma Administration has a good interface, clear navigation and smart shortcuts that give a fast and smooth workflow. There are several minor features to choose from that will make the work easier. All commands within each function are highlighted, making it possible to have easy access to all current operations (Visma, 2013).

The functions are divided into areas of work that gives a direct access to the program part the user want to work with. Clear tabs and icons for all functions navigate you right in each area. The tab can contain both functions that the user can work with and associated registers. Visma has many different functions and it covers a lot of areas. Examples of some areas are accounting, quotations, orders, billing, purchasing, inventory etc. (Visma, 2013).

4.2.3 Other Information Systems

In addition to the information systems mentioned above the company are using other ways of information sharing.

InfoTorg

“InfoTorg is Sweden’s leading provider of online information about private individuals, companies, properties and vehicles” (InfoTorg, 2013). InfoTorg is a web based information system that offers for example: business information, personal information, and vehicle information.

It is the vehicle information that OF Ekeri has access to. Through InfoTorg, OF Ekeri can see the ownership information, vehicle information, technical data about the vehicle, the previous owner, tax affairs, insurance information, driver's license information, inspection tasks, trailers, dispensers, shutdown periods, temporary registration etc. of their trailers (InfoTorg, 2013).

Prodreg

Prodreg is Ekeri’s (in Finland) product register. OF Ekeri can access a small fragment of the system through their computers so they can check the orders that they make. Today there is no integration between Prodreg and LIME (Fredrick, 2013).

Ekeri Sales Manager System

As mentioned in chapter 4.1 Introduction, Ekeri in Finland is by far the largest supplier to OF Ekeri. To make the purchase process easier for OF Ekeri, Ekeri in Finland gives OF Ekeri their Sales Manager System in the form of an Excel-file. OF Ekeri receives a new Excel-file time to time with upgraded information to replace the current file.

The Sales Manager System consists of Ekeri's products and prices and creates quotations and orders that OF Ekeri print out and send to customers and Ekeri in Finland. Today an integration between the Sales Manager and LIME barely exist. It is possible to access the sales manager through LIME but that is all (Fredrick, 2013).

Home Webpage/ Facebook page

To inform customers about OF Ekeri, the company uses a Home Webpage and a Facebook page. The customers get information about the different suppliers and OF Ekeri's products and different advertisements.

Kögel Ordering System (Citrix XenApp J)

Kögel 's ordering system is a web based information system where OF Ekeri creates quotations and orders. The system consists of Kögel's product and prices.

Mia at OF Ekeri (2013) states that there is an option to upgrade the system so the quotations and orders are send to Kögel through their system, but OF Ekeri order a very small amount from Kögel and the benefits are too few for that investment.

Mascus

Mascus is a web based information systems that supplies advertisement. Mascus is a leading worldwide media for heavy machinery in the fields of construction, agriculture, material handling, forestry and transportation vehicles (Mascus, 2013).

Mascus is a leading and unique multi-local concept that offers customers a diverse range of services and business opportunities. They export the advertisements to various websites that the company has elected. Mascus a well-known brand among all types of buyers, sellers, professional traders, retailers, importers and other owners of heavy machinery throughout Europe and the world (Mascus, 2013).

4.3 Information Flow

There are two purchase processes; purchase of trailers and purchase of spare parts. They are divided into two different chapters to provide a better picture of the information flow for each process.

Chapter 1.1 OF Ekeri mentions that OF Ekeri offers rental of trailers and the information flow of that process will be presented.

The information management during the transportation of all the purchases is also a big part and can take a lot time if the processes are undeveloped. Therefore an information flow of that process will be obtainable.

Marketing and advertising is done through Mascus webpage, OF Ekeri's webpage, Facebook page and the webpage blocket.se. Today OF Ekeri advertise used trailers in more than one web page and how that is done will also be explained.

4.3.1 Purchase of Trailers

The purchase process is different for each supplier except for Tyllis and Fokor, they have the same process. A detailed flowchart for each process will be presented and described.

OF Ekeri – Ekeri

In Figure 6, the order information flow as the system is built today can be seen. The steps are as follows (Claes, 2013):

1. OF Ekeri creates a quotation with the customer by phone or email. The quotation is done with an Excel (Ekeri Sales Manager Software) file that is accessed through LIME.
2. When the quotation is approved OF Ekeri creates an order and sends it to Ekeri in Finland and an order confirmation to the customer by fax, which means that the order has to be printed out and send manually.
3. Ekeri in Finland shows the order confirmation through Prodreg, Prodreg and LIME have no connection. The values in the order confirmation that are faxed to Ekeri have to be put in to LIME manually, which takes time. At this moment it takes a long time for the values to appear in Prodreg.
4. Ekeri in Finland then send an invoice to OF Ekeri (see chapter 4.3.4 Invoice handling and Figure 10 for invoice process).
5. OF Ekeri send an invoice to the customer (see chapter 4.3.4 Invoice handling and Figure 11 for invoice process).

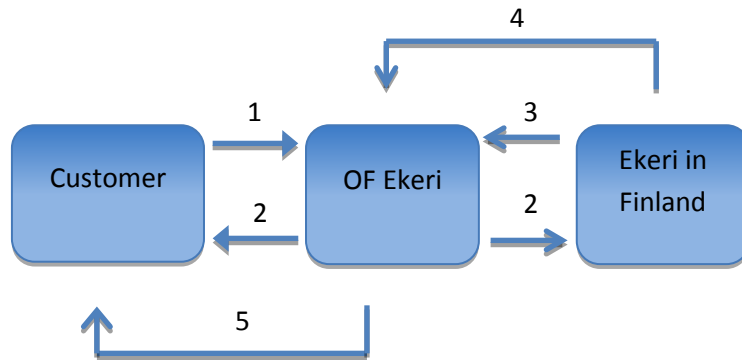


Figure 6: Purchase of trailers from Ekeri in Finland

Today, Ekeri in Finland want to have the orders on paper and therefore the orders are printed out and faxed to Ekeri in Finland. The values of the order will appear in Prodrig a couple of weeks later and the values have to be double checked because the product properties are manually registered by employees in Finland.

OF Ekeri – Tyllis

In Figure 7, the order information flow as the system is built today can be seen. The steps are as follows (Mia, 2013):

1. OF Ekeri creates a quotation with the customer by phone or email.
2. Of Ekeri send the quotation to Tyllis by email.
3. Tyllis sends back their version of the quotation to OF Ekeri to confirm that everything is correct and feasible.
4. When both parts have reached an agreement OF Ekeri creates the order and sends it back to Tyllis and to the customer by fax. The values of that confirmation have to manually be put in to LIME, which take time.
5. Tyllis then send an invoice to OF Ekeri (see chapter 4.3.4 Invoice handling and Figure 10 for invoice process).
6. OF Ekeri send an invoice to the customer (see chapter 4.3.4 Invoice handling and Figure 11 for invoice process).

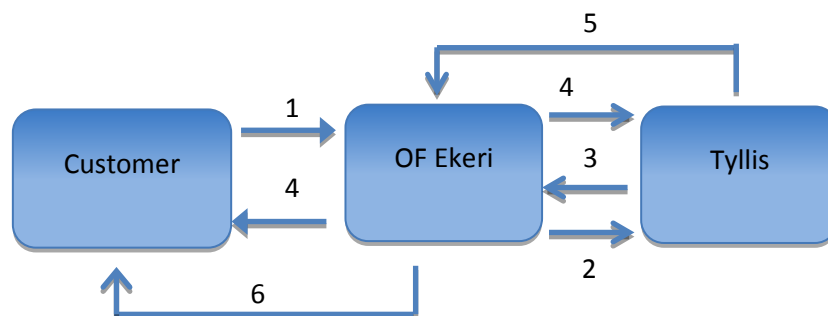


Figure 7: Purchase of trailers from Tyllis

OF Ekeri – Fokor

In Figure 8, the order information flow as the system is built today can be seen. The steps are as follows (Mia, 2013):

1. OF Ekeri creates a quotation with the customer by phone or email.
2. Of Ekeri send the quotation to Fokor by email.
3. Fokor sends back their version of the quotation to OF Ekeri to confirm that everything is correct and feasible.
4. When both parts have reached an agreement OF Ekeri creates an order and sends it to Fokor and to the customer by fax. The values of the confirmation have to manually be put in to LIME, which take time.
5. Fokor then send an invoice to OF Ekeri (see chapter 4.3.4 Invoice handling and Figure 10 for invoice process).
6. OF Ekeri send an invoice to the customer (see chapter 4.3.4 Invoice handling and Figure 11 for invoice process).

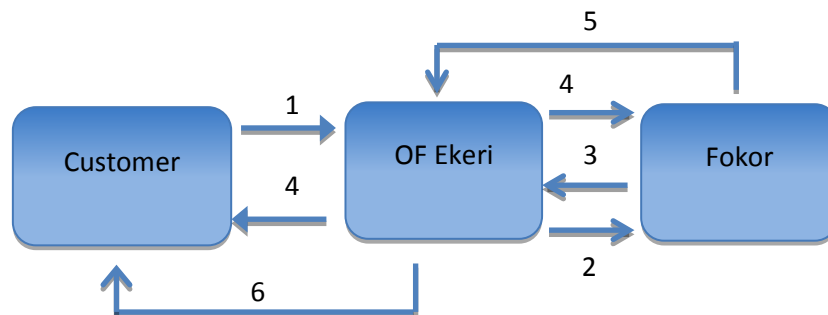


Figure 8: Purchase of trailers from Fokor

OF Ekeri - Kögel

In Figure 9, the order information flow as the system is built today can be seen. The steps are as follows (Mia, 2013):

1. OF Ekeri creates a quotation with the customer by phone or email.
2. OF Ekeri has access to a small part of Kögel's web based ordering system there they create the quotation that is approved by the customer. The quotation is then faxed to Kögel.
3. Kögel sends back their version of the quotation to OF Ekeri to confirm that everything is correct and feasible.
4. When both parts have reached an agreement OF Ekeri creates a order and sends it to Fokor and to the customer by fax. The values of that confirmation have to manually be put in to LIME, which take a lot of time.
5. Kögel then send an invoice to OF Ekeri (see chapter 4.3.4 Invoice handling and Figure 10 for invoice process).
6. OF Ekeri send an invoice to the customer (see chapter 4.3.4 Invoice handling and Figure 11 for invoice process).

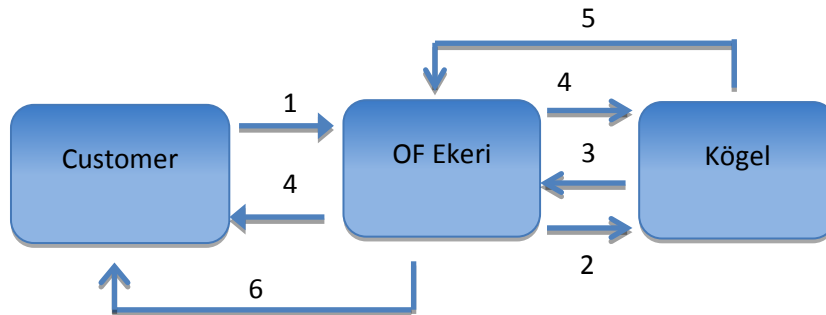


Figure 9: Purchase of trailers from Kögel

OF Ekeri – Used Items

The steps for purchase of used items are as follows (Fredrick, 2013):

1. OF Ekeri receives an order from the customer by phone or email.
2. OF Ekeri looks in LIME to see which used items they can offer. This step is very smooth. In LIME they can see the status of the item and from that tell the customer if they can offer them anything.
3. When a trailer is sold they have to give the trailer an order number. This is done manually.
4. The suppliers then send an invoice to OF Ekeri (see chapter 4.3.4 Invoice handling and Figure 10 for invoice process).
5. OF Ekeri send an invoice to the customer (see chapter 4.3.4 Invoice handling and Figure 11 for invoice process).

4.3.2 Purchase of Spare Parts

The purchase of the spare parts is an easy process. The steps for purchase of spare parts are as follows (Arne, 2013):

1. OF Ekeri receives an order from the customer by phone or email.
2. If the part is not in stock, the order to the supplier is done over the phone or by email.
3. Visma contains the stock balance and is used to check the stock balance, but that has to be done manually.
4. The spare parts arrive and the items are put in storage and manually put in to Visma.
5. The suppliers then send an invoice to OF Ekeri (see chapter 4.3.4 Invoice handling and Figure 10 for invoice process).
6. OF Ekeri send an invoice to the customer (see chapter 4.3.4 Invoice handling and Figure 12 for invoice process).

At this point Ekeri in Finland stands for 90 percent of the delivery of spare parts. There are about 1000 items in stock at this moment and that number is increasing. At this time Arne (2013) states that it is possible to check the placements of the products in the warehouse in Visma. This application is not used very much at this point. Due to lack of space, the items are sometime placed where there is room.

4.3.3 Rental of Trailers

Fredrick (2013) states that there are two different approaches of rental of trailers; the first approach is used if the trailer that the customer is looking for is in stock in Markaryd. The second approach is if OF Ekeri do not have the trailer and needs to purchase a new one. New trailers are bought from Ekeri in Finland (Fredrick, 2013).

First approach (the trailer is in stock):

1. OF Ekeri receives an order from the customer by phone or email.
2. OF Ekeri creates a quotation through LIMEs product registry. This process is smooth and developed.
3. The quotation is sent to the customer for approval. This is done through email as a pdf-file or sometime by phone.
4. When approved, an order is created in LIME and a rental agreement is printed and signed by OF Ekeri. Then mailed to the customer that has to sign it as well, and send it back. It is a lot of manual labor for OF Ekeri for a signed order.
5. When approved the customer comes to Markaryd to pick up the trailer
6. The customers pay the rental cost for the trailer each month (see chapter 4.3.4 Invoice handling and Figure 13 for invoice process).

Second approach (the trailer is not in stock):

1. OF Ekeri receives the order from the customer by phone or email.
2. When OF Ekeri do not have the trailer they have to purchase a new one. This process can be seen in chapter 4.3.1 Purchase of Trailers, OF Ekeri- Ekeri. The only difference is that when the customer is accepting the quotation, a rental agreement is also printed and signed by OF Ekeri. Then it is mailed to the customer that has to sign it as well and then they have to send it back. It is a lot of manual labor for a signed order.
3. The trailer arrives to Markaryd.
4. The customers pay the rental cost for the trailer each month (see chapter 4.3.4 Invoice handling and Figure 11 for invoice process).

Today OF Ekeri have all the responsibility over the trailer even though it is under the customer's care. OF Ekeri has to make sure that the trailer is road safe, inspected, serviced

and insured and so on. This information can be found on the information system InfoTorg (Fredrick, 2013), which is mentioned in chapter 4.2.3. Other information systems.

To have easier and faster access to the information on InfoTorg, Fredrick manually puts the information into LIME. This process does not take a lot of time but doing it manually increases the risk for mistakes and it is very important to get that information correct (Fredrick, 2013).

Today, Fredrick manually has to keep track of when it is time for service and inspections, which makes it easier to miss due to other responsibilities.

4.3.4 Invoice Handling

The steps that all the purchase processes have in common are the handling of the invoices from the suppliers (Carina, 2013). Figure 10 gives a better overview of the process. As can be seen a lot of the steps are manually and takes a lot of time.

The invoices that OF Ekeri get from the suppliers are sent by mail and the information is manually put in to Visma. The invoices have to be manually regularized and attested. The invoices are then manually send to the bank through Visma and manually approved through the bank’s webpage. Then that information is put into LIME with a touch of a button.



Figure 10: Invoice handling from suppliers

Invoice handling of purchases of trailers to customer

The invoices sent from OF Ekeri to the customer have to manually be put together in Visma. Carina (2013) says that this process is necessary and is done manually because they do not use a standard invoice, the invoices looks different for each customer. The invoices also have to be printed out manually and be sent by mail, see Figure 11. That process takes time and cost a lot of money.



Figure 11: Invoice handling of sold trailers to customer

Invoice handling of spare parts to customer

The invoice handling for spare parts is more evolved than invoicing for purchases, see Figure 12. All contact and order information for the spare parts are already in Visma and with a touch of a button Visma creates the invoices (Arne, 2013). This process is smooth and developed but the invoices have to be printed out manually and sent by mail. That process takes time and cost a lot of money.



Figure 12: Invoice handling of sold spare parts to customer

Invoice handling of rentals to customer

The invoice handling for the rentals is more evolved than invoicing for purchases, see Figure 13. LIME and Visma are integrated with each other. With a touch of a button the customer information is transferred to Visma from LIME and Visma creates the invoices (Carina, 2013). This process is smooth and developed but the invoices have to be printed out manually and sent by mail. That process takes time cost a lot of money.



Figure 13: Invoice handling of rentals to customer

4.3.5 Transportation of Trailers

Alf (2013) takes care of the transportation of the trailers. Today, the communication is done by phone or email. Alf takes care of the transportation within Sweden and the supplier makes sure it gets there.

The supplier contacts Alf a couple of days before shipping the trailer to tell him when it will arrive to Sweden. He has to make sure that the trailer is ready to be shipped on arrival. This is done by contacting people that are available to transport the trailer and this is done by phone. The contacts are stored in LIME.

It is important to make sure that the trailers from Ekeri, Tyllis and Fokor goes through registration inspection before delivered to the right address and the inspection time is booked by phone. The inspection is done in different places based on where the trailers are going. The trailers from Kögel have already gone through inspection before Sweden.

4.3.6 Marketing and Advertisement

Today OF Ekeri uses different webpages for marketing and advertising. They are as mentioned in chapter 4.2.3 Other Information Systems Mascus.se, blocket.se and OF Ekeri's home webpage.

Fredrick is responsible for the Home Webpage and the Facebook page where OF Ekeri promote with their products and other information that is good to know about them. Their webpage is constructed with a smooth and creative program called InternetEX, which makes the process very easy.

To avoid having to print advertisements on all Internet pages a web-based information system called Mascus is used. Malin (2013) states that Mascus is an established system which facilitates the advertisement and information sharing every good but at present all the information of the used trailers has to manually be put into Mascus and that takes a lot of unnecessary time. It is exactly the same properties that LIME already has stored.

5 Analysis and Improvement Proposals

This chapter will provide a thorough analysis of the company's current and coming information systems and concrete suggestions of improvements will be made based on the analysis.

5.1 Introduction

Figure 14 shows typical tasks which occur in most supply chain types, but with various contents in the particular businesses. (Stadtler, H & Kilger, C, 2004). Having Figure 14 in mind, OF Ekeri's current information systems covers most part of their supply chain as it is. In OF Ekeri's case, there is no production.

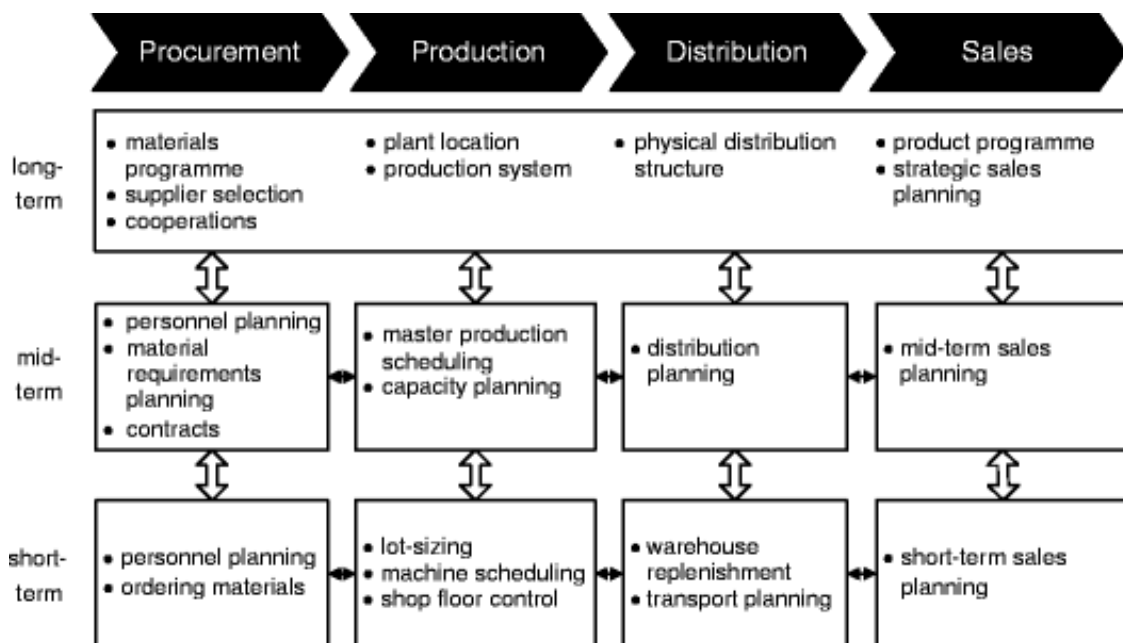


Figure 14: The Supply Chain Matrix

The areas that is not covered at the moment with an information system are mid-term sales planning (forecasting and inventory control) and short-term transport planning, see Figure 15 for a better overview on which areas the current Systems covers (keep in mind OF Ekeri has no production). The long-term planning tasks affect the information systems but are not decided with help from the systems. Here the design of the supply chain and the elementary material flows between suppliers and customers are decided.

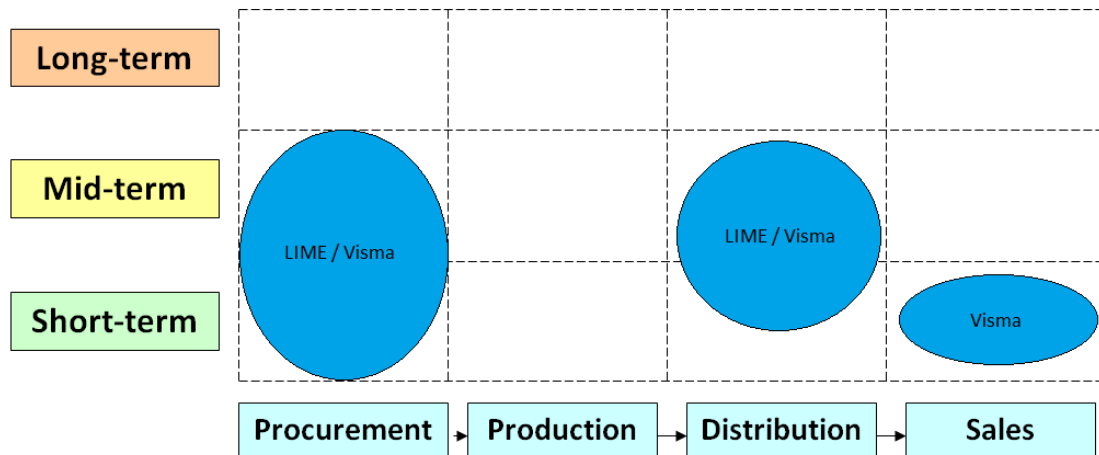


Figure 15: Overview of the information systems usage areas

There are specific areas of improvement that stands out when analyzing the empirical data and those areas have been analyzed further. They are:

- The collaboration between OF Ekeri ´s current information systems makes an investment in an ERP-system unnecessary.
- Lack of integration between LIME and Ekeri´s Sales Manager Software.
- OF Ekeri has to manually print out the orders/quotations and fax them to Ekeri in Finland and to the customers. OF Ekeri should be able to send the orders as a pdf-file with email or some other collaboration.
- Today OF Ekeri has no inventory control, which means that the tied up capital can be much higher than needed. Inventory control can also solve the location problem and increase the material handling.
- A lot of manual labor with paper work. The rental agreement is printed and signed by OF Ekeri. Then mailed to the customer that has to sign it as well and then send it back. It is a lot of manual labor for a signed order. Manual paperwork also occurs with order registration and invoice handling.
- Lack of integration between LIME and InfoTorg.
- A lot of manual labor when handling the invoices from the suppliers and to the customers. The invoices from the suppliers have to manually be put into Visma and the invoices to the customers have to be printed out manually and be sent by mail. These processes take time and cost a lot of money.
- Lack of integration between LIME and Mascus.

Chapter 4.1 Introduction mentions that Ekeri in Finland accounts for approximately 80 percent of the turnover. Fokor, Tyllis, Kögel and used items accounts for around 10 percent and rental accounts for around 10 percent (Claes, 2013). The amount of trailers that is bought from others suppliers beside Ekeri in Finland is too small which makes investments to change their purchase processes economically unsustainable. Therefore when analyzing the

purchase processes the collaboration between Ekeri in Finland and OF Ekeri has been the main focus.

A lot of companies have been under consideration during the analysis part of this master thesis. The chosen companies mentioned in the analysis are carefully selected after price, reputation and customer service.

5.2 ERP Solution

At this moment OF Ekeri is not using an ERP System. They are using LIME Pro as a CRM system and Visma Administration 2000 as a FMIS and WMS, see chapter 4.2 OF Ekeri's current information systems.

At present there are ERP systems that are specifically tailored to small and medium enterprises, which perform all tasks efficiently from a single platform, from accounting, customer and sales tracking and logistics to payroll and time reporting.

In the article by Mjöbring (2011) he states that some of the reasons for the success of smaller ERP system providers are that they have a better flexibility for adapting to technology development and it is easier for them to alter the system framework to adjust to new functions. They are usually specialized in a certain business areas, they are made for the right company culture as well as the smaller ERP providers fit smaller companies better. Some examples are Mamut One Enterprise E5, Jeeves and Microsoft Dynamics NAV.

Investing in an ERP system right now is not relevant for OF Ekeri. Although ERP systems have been developed over the past years, the investment costs are still too high for OF Ekeri's budget. The price range is around 13.000 to 20.000 SEK (depending on the system) for licenses and then there are costs for training and additional modules. A more exact number is difficult without a closer analysis from the companies (Mamut, 2013; Microsoft Dynamics NAV 2013).

The investment will be far too expensive relative to the generated benefits you get from an implementation, especially when OF Ekeri have relatively good integration between LIME and Visma today. Right now there are improvements for OF Ekeri's current systems that are better to focus on which will optimize their way of working and save them time. That investment will be significantly cheaper, more relevant, take much less time to implement and fit them very well.

An ERP system would have been more fitting if OF Ekeri had offices in various places, had production of trailers instead of just buying them and selling them and handled more products and transportations. The systems LIME and Visma and their ability to integrate with

each other and other web-based systems make it unnecessary to invest in an ERP system in OF Ekeri's case.

5.3 Better Integration between LIME and Ekeri Sales Manager

Today the values of the order confirmation that are faxed to Ekeri have to manually be put in to LIME, which take time, see chapter 4.2.1 Purchase of Trailers.

Figure 16 shows how the trailer properties section in LIME looks. All those windows have to manually be filled with the technical data that Ekeri 's sales manager consist of.

The screenshot displays the 'Fordonsinformation' (Vehicle Information) section in the LIME system. It contains various input fields for registration number, manufacturer, model year, status, and chassis details. Below this, there are sections for technical specifications such as dimensions, weight, and axle configurations. A 'Besiktning och service' (Inspection and service) section includes dates for the last and next inspections. At the bottom, there is a 'Gamla fält' (Old fields) section with a table of historical data.

Skapad (System)	Kommentar	Kontaktperson	Medarbetare	Sökväg	Företag	Affär	Kampanj	Fordon
2007-11-20 10:38...	Sa -OF Ekeri AR H...		Bo_Olsson		OF Ekeri AB Markaryd			RH 432
2008-08-22 10:34...	Hysesavtal, Regi...				Åkeri AB Elis Carlsson Oskarsha...			BJJ 432
2008-09-03 13:38...	BJJ 432 Ågarbyte ...				OF Ekeri AB Markaryd			BJJ 432
2008-11-25 10:08...	BJJ 432, BPW förl...				Foma Fordonsmateriel AB Ang...			BJJ 432
2009-01-07 13:04...	BJJ 432 E020 Avs...				OF Ekeri AB Markaryd			BJJ 432
2009-06-22 14:05...	BJJ 432 avst. 09.0...							BJJ 432

Figure 16: Example of LIME product register

The Sales Manager System consists of Ekeri products and prices and creates the quotations and orders in the Excel-file that OF Ekeri prints and send to the customers and Ekeri. One of the sections in the Excel-file has all the technical data gathered.

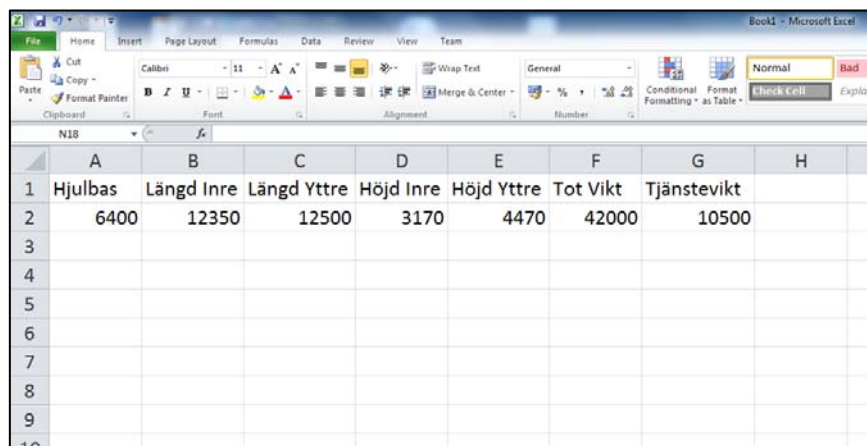
Johan Österholm (2013) at Ekeri in Finland states that the sales manager will be replaced with another system (configurator) they call CF. The idea of the CF in short terms is:

- The quotation is created in OF Ekeri's CRM system, which is LIME.
- CF generates an appendix with technical specifications that should be submitted with the quotation. The specifications appendix will have a PDF-format. To make it possible for OF Ekeri to transfer the technical specifications without a lot of manual

labor, a parallel flap can be constructed in CF with the specifications (Johan Österholm, 2013). How that flap should be constructed can be seen further down in this this chapter.

- The CF calculates the price (which is not printed in the specifications) and the price and OF Ekeri ´s margin is placed in LIME. This can be done manually or automatically if the CF is linked to LIME.
- With a placed order the PDF-file with the specification data should be added as an appendix. How this process will be working will be explained further in chapter 5.4 Better Order Placement.

It is important that the file with all technical specifications can be saved as a tab-separated text file (Filip, 2013). The cells of information need to have a special structure to be able to save it as a tab-separated text file, see Figure 17. That file can then easily be imported into LIME and all the values will appear in the empty windows.



	A	B	C	D	E	F	G	H
1	Hjulbas	Längd Inre	Längd Yttre	Höjd Inre	Höjd Yttre	Tot Vikt	Tjänstevikt	
2	6400	12350	12500	3170	4470	42000	10500	
3								
4								
5								
6								
7								
8								
9								
10								

Figure 17: Example of Excel flap structure

Filip (2013) states that if Ekeri in Finland can create that structure for the specifications, the implementation time for the solution will take Lundalogik around 4 hours with an hourly fee of about 1000 SEK/hour. That is a total cost of about 4000 SEK

5.4 Better Order Placement

As mention in chapter 4.3.1 Purchase of Trailers, OF Ekeri-Ekeri, Ekeri wants the orders on paper and therefore the orders are printed out and faxed to Ekeri in Finland. The values of that order will OF Ekeri see in Prodreg a couple of weeks later and the values have to be double checked because the product properties are manually put in there by employees in Finland. This is a waste of time and resources for both parties.

Stefan Ketola (2013) at Ekeri in Finland states that they have created an order email box that has the address *order@ekeri.fi* that will be able to receive upcoming orders. To that address the order and the specification file will be sent instead of sending it to Ekeri in Finland by fax.

This solution has been tested in Norway for a while with good results and can basically be put into use immediately in Sweden as well.

5.5 Inventory Control

Today, the ordering and handling of spare parts is badly designed. Not having access to any forecasts, predetermined order quantities or reorder points can contribute to large stocks of products with low demand and low stocks of products with high demand. A result of this is that the tied up capital will increase while the service levels will decrease.

One relatively easy way to obtain more “accurate” inventory levels is to introduce a (R, Q)-ordering policy for the regular retail items. Axsäter (2006) defines (R, Q)-ordering policy as “When the inventory position declines to or below the reorder point R, a batch quantity of size Q is ordered”, see Figure 18. The inventory position is defined as “stock on hand + outstanding orders - backorders”.

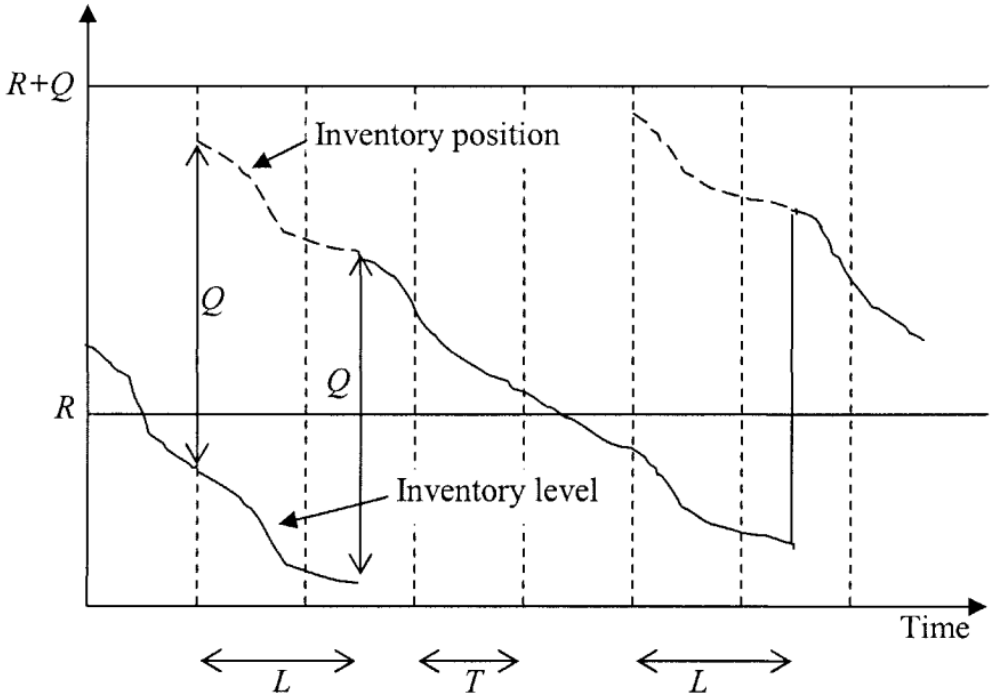


Figure 18: (R, Q)-ordering policy (Axsäter, 2006)

Today Visma Administration 2000 already contains a function to use the (R, Q)-ordering policy (Andreas, 2013). The calculated R value is put into the “Beställningspunkt” box and the value of Q is put into the “Minsta beställning” box. , see Figure 19, (Andreas, 2013).

Kvantiteter	
Beställningspunkt:	<input type="text" value="10"/>
Max nivå:	<input type="text" value="0"/>
Minsta beställning:	<input type="text" value="0"/>

Figure 19: Visma (R, Q) option

The inconvenience is that Visma cannot calculate values based on other sales history in the system. The values of R and Q have to manually be calculated and manually inserted (Andreas, 2013).

There are different ways of calculating the optimal order quantity reorder point depending on the customer demand. In OF Ekeri's case when the demand is not that high and each customer can request one or several units at the time, the best alternative will be to calculate with compound Poisson distributed demand. The distribution of demand size in the compound Poisson distribution is stochastic (random) and is called the compounding distribution (Axsäter, 2006). Today these calculations can be done with inventory management software.

A company that has great success with inventory management software is Synchron. They are a global company with offices all over the world such as Japan, United Kingdom, Australia, India, Italy and Sweden. They deliver software and services for global supply chain planning, fulfillment and supply. The company has been in the supply chain business for over 15 years and offers software's for inventory control to smaller companies. (Synchron, 2013)

Synchron can offer a software called EazyStock which can help OF Ekeri with their inventory control of spare parts. EazyStock allows you to meet very high service level targets for all fast, slow, intermittent or erratic parts and at the same time reduce working capital, stock-outs and emergency orders (Synchron, 2013).

Synchron will shortly launch a single edition of EazyStock that is suited for companies with less tied up capital like in OF Ekeri's case. OF Ekeri can upload data into to EazyStock using Excel. Then analysis will be made and it will indicate how much of the products in the warehouse are in good shape, how much that is overstock and the proportion that is no longer in demand. (Agneta, 2013)

A free campaign that Synchron offers (2013-11-13) has been used to calculate the optimal tied up capital that OF Ekeri should have today compared to the actual value. It will also calculate the optimal R and Q value and show statistics for each item. The calculations have been made based on information gathered from Visma. The type of values can be seen in Table 1. The only value that could not be received from Visma was the activation date for the articles. The problem with that can be if there are new items in the warehouse, the

consequence can be that they may be perceived as obsolete by the system if they do not have any transactions, while they really are new and not established (Agneta, 2013).

ITEM_CODE	Code to uniquely identify the Item within the locations
DESCRIPTION	Item description valid at the location
UNIT_COST	Unit cost for this Item, expressed in the currency for the location.
PREF_SUPP_CODE	Code to uniquely identify a Supplier to the locations. The Supplier is treated as the preferred Supplier for this Item.
ACTIVATION DATE	The date at which the product became active. Used in forecasting calculations. Only demand data from this date and forward can be used in forecasting calculation. If not sent, system will set to the earliest moment of an item or two year back in time as default
LEAD_TIME	The lead time (in calendar days) associated with the default supplier
CURRENT_STK	Current stock available on hand (when <i>not</i> considering reservations or back orders).
RESERVED_STK	Stock present which cannot be issued to any customer. Note that this will be deducted from the current stock in calculation of the “stock balance” visible in the system
BACK_ORDER_QTY	Total amount of customer back order quantity. Note that this will be deducted from the current stock in calculation of the “stock balance” visible in the system*
ORDER_QTY	The quantity requested by the customer
DEMAND DATE	Date on which the ordered quantity was requested by the customer.
ORDER_NUMBER	The sales order reference associated with this demand
ORDER_LINE_NUMBER	The order line reference associated with this demand .

Table 1: Values analyzed by EazyStock Software

Today OF Ekeri has 2 – 2, 2 millions of tied up capital in their warehouse (Arne, 2013). That amount is small but with today’s technology good systems have been developed to suit companies with less tied up capital.

The results of EazyStock’s demo campaign are very clear and significant. It states that a lot of the tied up capital can be reduced, see Figure 20. Today the tied up capital is around 1.960.000 SEK (2013-11-19). EazyStock shows that OF Ekeri’s warehouse consist of obsolete items with a value of around 522.000 SEK, see the red color in Figure 20. Obsolete items means that the items have not been moved (sold) for 1.5 years. The yellow color in Figure 20 stands for non-obsolete items that are overstocked with a value of around 865.000 SEK and the green color stand for a healthy stock with a value of around 610.000 SEK. The orange line in Figure 20 shows the target stock value, which is around 480.000 SEK. These values are

calculated based on different values like picks covered at 99.3 % and with a service level of 95 % in the EasyStock software (these values are changeable).

Figure 20 clearly shows that OF Ekeri has major over stock which can be reduced by **65- 70 %** and still keep a high service level. This will result in major savings, increase the work area and increase the material handling due to less tied up capital. This will also result in less investment costs to rebuild and increase the size of their current warehouse.

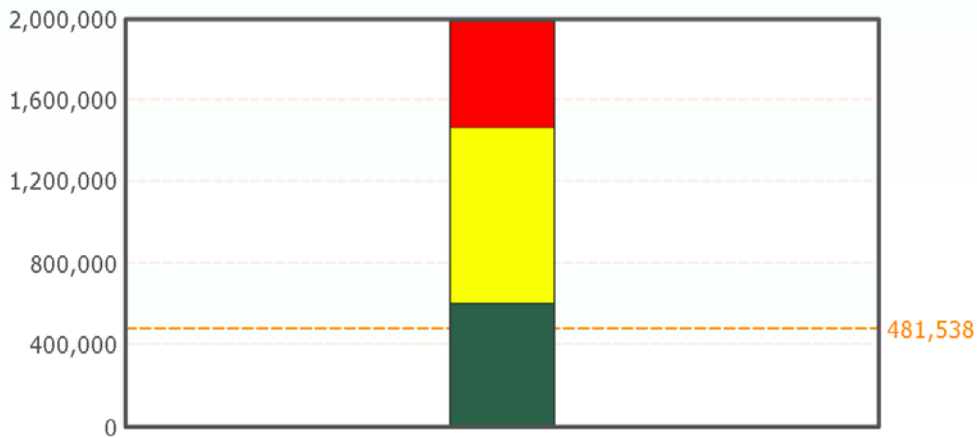


Figure 20: Inventory Summary

Based on values in Table 1, the EazyStock demo software summarized which demand types the current stock items has, see Figure 21. More detailed information about the amount of items for each demand type, stock value and sales value can be seen in Table 2. The row for new items is 0 because the activation date could not be received from Visma.

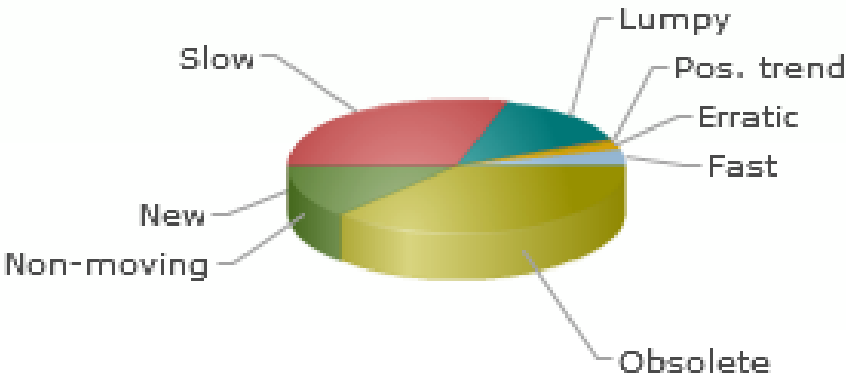


Figure 21: Demand type Summary

	No.	Stock value (SEK)	Sales (SEK)
Fast	40	192,342	1,255,014
Erratic	19	84,855	1,246,795
Pos. trend	3	10,406	42,376
Neg. trend	3	38,651	69,227
Lumpy	132	270,565	537,478
Slow	295	632,858	1,768,121
New	0	0	0
Non-moving	125	235,145	246,034
Obsolete	363	521,870	2,287
TOTAL	980	1,986,692	5,167,332

Table 2: Demand type summary

Agneta (2013) says that Synchron will launch the Basic Edition of EazyStock in early 2014. It will cost 5000 SEK / month and you get to take 3 months at a time, which simplifies invoicing. A more exact number of how much OF Ekeri will save in pure savings is hard to calculate at this moment because OF Ekeri count on a certain percentage of the turnover as a cost including property and personnel. The interest rate is not specified in the budget (Claes, 2013), but the savings will be substantial.

Agneta (2013) states that there is a possibility to integrate the Basic Edition of EazyStock with Visma, which will optimize the work hours and create easy access to new calculated inventory values like the optimal R and Q value. The extent of the implementation can be discussed after the implementation of the EazyStock software (Agneta, 2013).

5.6 Digital Signature

Digital signature is an option to facilitate the paperwork for rental and the sales of trucks. In the present situation, OF Ekeri print contract to those who wish to rent, sign it and then either scan it into the computer again and send it by email or fax it to the customer who has to do the same process, see Chapter 4.3.1. Purchase of Trailers.

Digital signature facilitates this process significantly and saves a lot of paperwork. It works in such a way that the documents are saved as PDF-files that can be signed. The files are then sent to Comfact which is a company that handles the signing and then sends back a signed copy to OF Ekeri. The advantages of digital signature is reduced costs and working hours, increased security of your documents, improved efficiency with the right quality, reduced environmental impact and increased business opportunities (Comfact, 2013).

To access the digital signature module in LIME would cost OF Ekeri around 40.000 SEK for the module and then Comfact takes payment for each document that is signed. (Samir Smajic, 2013)

Today OF Ekeri only signs contract with the customers that rent trailers and unfortunately the Return of Investment (ROI) for investing in a digital signature module will be too long. If OF Ekeri grows and increases the amount of contracts that needs signing this solution would be more suitable.

5.7 Better Integration with Web Based Systems

Today OF Ekeri has two major areas that can be improved with better integration between LIME and the web based information system. The first area is between LIME and InfoTorg. Fredrick has to manually put the information from InfoTorg into LIME and manually keep track when it is time for service and inspections which is mention in chapter 4.3.3 Rental of Trailers. The second area is between LIME and Mascus. At present all information about used trailers has to manually be put into Mascus and that takes a lot of unnecessary time. It is exactly the same properties that LIME already has stored and this is mentioned in chapter 4.3.6 Marketing and Advertisement.

LIME offers custom integration. Depending on the circumstances, technology and experience it is possible to choose the right method, without being locked to a specific solution (Lundalogik, 2013).

5.7.1 LIME - InfoTorg

There are two different solutions to solve the manual labor for Fredrick. The first solution is to integrate LIME with InfoTorg. By pressing a button or link in LIME the information from InfoTorg is updated automatically. This solution will take Lundalogik about 10-20 hours to implement depending on how InfoTorg looks and it will cost between 10.000 – 20.000 SEK (Filip, 2013).

Filip (2013) states that it is possible to add a function to keep track of the possible changes that can occur each time OF Ekeri press the update button/link. It is possible to get the updates by email or in a report in LIME. This function will take around 4 hours to implement and cost around 4000 SEK.

The second solution is to make LIME automatically update the values from InfoTorg once a day. This solution is more advanced which means that it will take more time and cost more to implement. Filip (2013) says that this solution will take between 20-40 hours to implement, which is a cost of 20.000 to 40.000 SEK.

As mentioned in chapter 4.3.3 Rental of Trailers. Today the process of manually put the information from InfoTorg into LIME does not take a lot of time but doing it manually increases the risk for mistakes and it is important to get that information correct . The solution to automatically update the information by pressing a button or link in LIME will suit OF Ekeri well.

5.7.2 LIME- Mascus

In this case, OF Ekeri can use two different methods. They can use either LIME Pro Web service or XML documents.

LIME Pro Web Service

LIME Pro Web Service is a general solution for communicating with LIME database. It is possible to simply read or write information to / from LIMEs database in a standardized and secure way. If a customer's data is updated, it is automatically in LIME Pro as well, through the web service that the business system connects to. (Lundalogik, 2013)

There are several advantages of using LIME Pro Web Service when integrating, some of them are: (Lundalogik, 2013)

- Communication is done through standardized protocols
- Secure and encrypted transmission
- Platform independent on the client side
- Standardized interfaces with guaranteed backward compatibility

XML-Document

LIME server can read / export XML (Extensible Markup Language) documents. XML is a flexible way to create common information formats and share both the format and the data on the World Wide Web, intranets and elsewhere. For example download an XML document from a predetermined location and update the database.

Chosen method

Filip (2013) prefer a scheduled job in LIME exporting an XML file to a FTP folder every night / week. FTP stands for "File Transfer Protocol" and is a shared folder online that different companies can access.

At this moment the images are placed in a folder on the computer instead of LIME but placing them in LIME can be done without problems. It is possible for images to either be transferred to the FTP folder as images or a part of, the XLM files.

Filip (2013) says that this solution will take between 4-16 hours to implement and cost between 4000 to 16.000 SEK.

5.8 Invoice Handling

Something that all invoice handling processes have in common is that it takes a lot of manual labor to process the invoices from the suppliers. The invoices to the customers has to manually be printed out and then manually send to the customers by mail, see chapter 4.3.4 Invoice handling.

5.8.1 Invoice Handling from Suppliers

Today OF Ekeri send around 250 - 300 supplier invoices each month which take around 20-30 work hours each month (Carina, 2013), which corresponds to around 7500-10.000 SEK each month, calculating with 300 SEK per hour, just to handle their invoices from their suppliers. A solution to this problem can be Centsoft Invoice that Centsoft offers. That is a function that handles the supplier invoices electronically. It will save time, money, the environment, create order and clarity and give easy access to the invoices (Centsoft, 2013). Centsoft is a company that offers that service and has created integrations with Visma Administration.

There are three offers from Centsoft. The cornerstone is always the web application Centsoft Invoice Software. In this program the invoices receives an account code and then sends them round for approval. When the notarization is complete, the invoices are sent into Visma automatically where they are then paid. (Christoffer, 2013)

Centsoft offers different options on how to get the invoices into the Centsoft Invoice Software. The following three ways are available to accomplish this (Christoffer, 2013):

1. The invoice is scanned directly into Centsoft Invoice software. No interpretation of the invoices is done which means that the supplier, invoice number, date and the sum has to be manually put into Centsoft Invoice. Then the invoices receive an account code and get approved.
2. The invoice is scanned into Readsoft Online which is a cloud service. Readsoft Online interprets the invoices automatically. The interpreted invoice goes into the Centsoft Invoice Software where the invoices receive an account code and get approved.
3. Complete outsourcing, change the billing address to a scanning central that opens the invoices, scans and interprets them. Then they go into Centsoft Invoice where the invoices receive an account code and get approved.

The price for the services can be seen in Table 3 (Christoffer, 2013):

Service	Price
Implementation project*	15.000 SEK
Centsoft Invoice	2604 SEK /Month
Interpretation by Readsoft Online (in addition to the price of Cent Soft Invoice)	4 SEK / Invoice
Complete outsourcing (in addition to the price of Cent Soft Invoice)	5 SEK / Invoice**

Table 3: Prices for different supplier invoice handling alternatives

*Installation, configuration and training is included in the price.

** 4 SEK / Invoice if the invoice is sent in digital form from the supplier.

Today most of Centsoft´s customer chooses the Readsoft Online option, in that way the customers do not have to change the billing address and they can keep the original invoice (Christoffer, 2013).

In OF Ekeri´s case the best solution would be to do a complete outsourcing, doing that takes away all the paperwork and save most time. They have 4 suppliers; Ekeri, Tyllis, Kögel and Fokor so changing the billing address will not take long and not be complex. Today´s law states that the original invoice has to be saved for 7 years. However, the originals do not have to be stored at OF Ekeri, they can be stored at the scanning center for a cheap price. The price for archiving invoices is currently located at 144 SEK / meter and year. One meter equals several thousand invoices. The cost for archiving is thus very low, even after many years (Christoffer, 2013).

5.8.2 Invoice Handling to Customers

Today OF Ekeri send around 300 invoices each month and puts around 80.000 SEK annually and around 20 work hours just to handle their invoices to customers (Fredrick, 2013). A solution to this problem can be Visma E-invoice which is a function that Visma offers. It will save time, money and the environment. Visma E-invoice is electronic invoices, ready to use immediately without any expensive investments or consultants (Visma, 2013).

The invoices are created in Visma which passes the electronically to Visma Spcs. Customers who can receive e-invoices get it electronically. There is an opportunity to let Visma Spcs take care of all invoices, using Visma ePrint, which also is included in the service and let them take care of printing of invoices as well. Customers that cannot receive e-invoices gets traditional invoices by mail with OF Ekeri´s logo on it. It is also possible to use Visma E-invoice as a supplement as well. In Visma it is possible to select the recipients that can receive electronically invoices and then manually take care of the rest.

The price for the services can be seen in Table 4 (Visma, 2013).

Service	Price
Yearly fee	990 SEK
One page, stamped and sent with B-mail	7,90* SEK
Additional for A-mail	0,40 SEK /pcs
Additional pages	0,60 SEK /pcs
Rate for electronic documents	1,90 SEK

Table 4: Prices for different customer invoice handling alternatives

*Prices are subject to change in postage rate

Today more and more companies, governments and municipalities require e-invoicing. There is no issue, rather an opportunity for economic, temporal and not least environmental savings for both the supplier and the customer (Visma, 2013).

Fredrick states that today at least 50 % (conservatively) of their customers are big enough companies to handle e-invoices.

In OF Ekeri's case the best solution would be to do a complete outsourcing, doing that takes away all the paperwork and save the most time. Using Visma E-invoice and make Visma Spcs take care of all the invoices will generate savings in both cost, labor and be better for the environment and still keep the logo on the invoices as marketing.

6 Implementations and Results

This chapter will give examples of possible and feasible implementations based on the improvement proposals and the problems mentioned in chapter 1.4 Problem Definition. The results of the different implementations will be presented.

6.1 Introduction

The recommended implementations that OF Ekeri should do are presented below, for more detailed information about the improvements see chapter 5. Analysis and Improvements Proposals. Some general outcomes are that the suggested investments have a reasonable investment cost relative to the benefits they generate, a short return of investment (ROI) time and will improve the way of working. They are also realistic for the OF Ekeri to implement with regard to both capital and time.

6.2 What to Implement

Integration between LIME and CF

This implementation is not about the ROI as much as optimization of the way they work at OF Ekeri. The solution will save time, some money and the environment due to less paperwork, but the main benefit is that the solution is very suitable for the new possible way of sending the quotations and orders to Ekeri in Finland. There will be no need to print out any papers (if the customer also can receive the quotation by mail), see chapter 5.4 Better Order Placement.

Use Ekeri's new email box to place quotations and orders

This solution will save both money and work hours for OF Ekeri and be better for the environment due to less paperwork.

Implement Inventory Control Software, EazyStock

The result of this implementation will be that OF Ekeri can reduce their tied up capital by **65-70 %** and still keep a high service level. This will result in major savings, increase the work area and increase the material handling due to less tied up capital. This will also result in less investments cost to rebuild and increase the size of their current warehouse.

Agneta (2013) says that Synchron will launch the Basic Edition of EazyStock in early 2014. It will cost 5000 SEK / month and you get to take 3 months at a time, which simplifies invoicing. A more exact number of how much OF Ekeri will save in pure savings is hard to calculate at this moment because OF Ekeri count on a certain percentage of the turnover as a cost including property and personnel. The interest rate is not specified in the budget (Claes, 2013), but the savings will be substantial.

Integration between LIME and InfoTorg

This implementation is not about the ROI as much as optimization of the way they work at OF Ekeri. The solution to automatically update the information by pressing a button or link in LIME and the function to keep track of the possible changes will suit OF Ekeri best. The solution will cost between 14.000 – 24.000 SEK and it will save some time and money in less work hours. The main and most important benefit of this solution is that it will create more accuracy and stability for Fredrick and OF Ekeri which is the main application.

Integration between LIME and Mascus

This implementation is not about the ROI as much as optimization of the way they work at OF Ekeri. The implementation of a scheduled job in LIME exporting an XML file to an ftp folder every night / week will optimize the way they work at OF Ekeri. The solution will cost between 4000 to 16,000 SEK and save time, money in less work hours and save the environment due to less paperwork.

Outsourcing the Invoice Handling from the Suppliers

The result of the outsourcing implementation will be less administrative work, save time and money, create order and clarity and give easy access to the invoices.

Beside the implementation cost of 15.000 SEK, the monthly cost for the outsourcing solution will be around 3500-4000 SEK depending on the amount of invoices and the amount of invoices that are digital. Today Ekeri in Finland stands for 90 % of the invoices (Carina, 2013) and they can send the invoices in digital form upon request (Tom, 2013). Tyllis and Kögel can also send the invoices in digital form upon request (Marjukka, 2013; Andrea, 2013). The saving for each month will be around 6000 SEK. This means that the ROI for the implementation will be around 2-3 months.

Outsourcing the Invoice Handling to the Customer

The result of the outsourcing implementation will generate savings in both cost and labor and be better for the environment and OF Ekeri will still be able to keep the logo on the invoices as marketing.

Using Visma E-invoice and make Visma Spcs take care of all the invoices will cost around 15.420 SEK each year. This calculating with 50 % e-invoices and with 3 pages B-mail. The annual savings when making the implementation will around 64.000 SEK each year.

7 Conclusions and Discussion

The chapter answers the purpose of this master thesis by summarizing the results of the case study and contains conclusions of the research and a discussion around different aspects and assumptions.

The purpose of this master thesis has been to provide a flow chart of how the information is handled today and find out if there are possible improvements for the existing information systems, how they can be improved by possible system development and/or working changes. Also show if it is possible and feasible to integrate the different systems with some kind of ERP system or some less advanced systems. This has been achieved by gathering a lot of empiric information and deeper analysis and a lot of contact with experts within each field.

From the results, conclusions can be drawn. OF Ekeri, like all others companies, has room for improvements. Some areas are more efficient than others though. As OF Ekeri might grow with more rentals of trailers it is extra important to be both efficient and effective.

Today OF Ekeri does not have an ERP system. Investing in a new system will probably have long payback time at this stage and it is better to wait until the company is bigger and have a real use of such a system. Investing in an ERP system right now is not relevant for OF Ekeri. An ERP system would have been more fitting if OF Ekeri had offices in various places, had production of trailers instead of just buying them and selling them and handled more products and transportations.

The information systems LIME and Visma and their ability to integrate with each other and other web-based systems facilitates very much, which makes the current systems good enough for OF Ekeri. The upgrades to their current information systems will generate big saving relative to the implementation cost and give great results.

Some of the implementations will not generate a lot of saving but is still very important. They are not about the return of investment (ROI) as much as optimization of the way they work and increase the efficiency at OF Ekeri.

Three major implementations are inventory control software (EazyStock) and outsourcing of the supplier and customer invoicing. These three alternatives are the largest and will effect OF Ekeri the most. The implementations are bigger, take more time and needs training to but they have a short ROI time and will result in major savings, less administrative work and save time. More exact numbers can be seen in chapter 6.2 What to Implement.

It will be important for the employees at OF Ekeri to be able to trust the new recommended implementations for them to reach optimal results. For example, the decision to outsource all of the invoice handling is a good idea for OF Ekeri. A lot of customers choose not to outsource completely because they want to keep the original invoice (Christoffer, 2013), but outsourcing and trust Centsoft will save OF Ekeri the most time and lets them focus on their core competences for example sales and customer relations.

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