Satakunnan ammattikorkeakoulu

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IMPROVING THE INTERNAL SUPPLY CHAIN FROM A CASE
COMPANY PERSPECTIVE

Degree Programme in International Business and Marketing
Logistics
2009

SISÄISEN TOIMITUSKETJUN PARANTAMINEN KOHDEYRITYKSEN NÄKÖKULMASTA

Tämän opinnäytetyön tarkoituksena oli tutkia sisäistä toimitusketjua ja hankintaa kohdeyrityksen näkökulmasta. Opinnäytetyö tehtiin kohdeyritykselle, joka toimii jälleenmyyjänä teollisuustarvikealalla. Kohdeyritys halusi parantaa yrityksen sisäisiä operaatioita, joten tutkimuksen keskipisteiksi valittiin sisäinen toimitusketju, sisäisen yhteistyön parantamiseen sekä sisäisen toimitusketjun mittaus. Kohdeyritys toimii jälleenmyyjänä, joten hankinnalla on iso vaikutus operaatioihin ja siksi myös hankinta valittiin yksityiskohtaisempaan tarkasteluun.

Opinnäytetyön teoreettinen osa tutki sisäisten funktioiden välisiä suhteita ja keinoja joilla parantaa yhteistyötä sisäisessä toimitusketjussa painopisteenä informaatioteknologia. Toinen tutkimusaihe koski hankintaa ja integroituun hankintaan vaikuttavia tekijöitä. Kolmas tutkimusaihe tutki, mitä mittoja voitaisiin soveltaa sisäisen tehokkuuden parantamiseen.

Tutkimusmenetelmäksi valittiin kvalitatiivinen metodi. Kolme kohdeyrityksen työntekijää valittiin haastateltaviksi. Haastateltavat valittiin heidän asiantuntemuksensa perusteella. Haastattelut suoritettiin kohdeyrityksessä käyttäen ennalta suunniteltua haastattelurakennetta. Tietolähteenä käytettiin myös henkilökohtaisia observaatioita, jotka hankittiin työskentelemällä kohdeyrityksessä.

Tutkimustulokset tuottivat tyydyttävän tasoista tietoa sisäisestä toimitusketjusta ja hankinnasta. Mutta tiedot sisäisen toimitusketjun mittauksesta eivät olleet riittäviä. Tutkimuksen tulokset osoittivat, minkälaiset funktioiden väliset suhteet olivat sekä millä tavoin yhteistyötä sisäisessä toimitusketjussa voitaisiin parantaa. Tulokset myös tuottivat tietoa integroidusta hankinnasta ja siihen vaikuttavista tekijöistä. Tutkimuksen perusteella kohdeyritykselle suositeltiin funktioita ylittävää tiimityöskentelyä tukemaan sisäistä integraatiota. Kohdeyritykselle myös ehdotettiin, että se tarjoaisi koulutusta yrityksen informaatioteknologiaohjelmaa varten. Suosituksia annettiin myös koskien hankinnan ja toimitusketjun mittauksen kehittämisestä varten tulevaisuudessa.

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March 2009
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UDK: 658.7.
Number of pages: 70

The purpose of this thesis was to study the internal supply chain and purchasing from a case company perspective. The thesis was done for a case company that operates as a trade company in the area of industrial supplies. The case company wanted to improve their internal operations, thus the research focus was on internal supply chain, improving internal co-operation and measuring the internal supply chain. As a trade company the purchasing of the case company has a big impact to its operations, thus it was chosen to be studied in more detail.

The theoretical part of this thesis examined relationships of internal functions and ways to improve co-operation in the internal supply chain with an emphasis on information technology. The second part included purchasing and factors affecting the integrated purchasing. The third study area examined what measures could be taken to improve the internal efficiency.

A qualitative method was chosen for the empirical study. Three employees of the case company were chosen to be interviewed. The interviewees were chosen based on their expertise on concerning issues. The interviews were conducted with the use of predetermined interview structure and the interviews took place in the case company. Personal observations that were obtained by working in the case company environment were also included as an information source.

The research results provided satisfactory information about the internal supply chain and purchasing, however information concerning internal supply chain measurements was not sufficient. The results of the research show what the relationship of functions is as well as in what ways the co-operation in the internal supply chain can be improved. The results also indicate information about integrated purchasing and factors affecting it. Based on the research the case company is recommended to include cross-functional team work to support the internal integration. It was also proposed that the case company would provide proper training for the IT program. Recommendation for future development of purchasing and a measuring system were also provided.

TABLE OF CONTENTS

1 INTRODUCTION

The competition in the business world is changing as today companies are not just competing against each other but supply chains are competing against each other. As customers are becoming more knowledgeable and demanding the necessity for a company to have an efficient internal supply chain is growing. The primary process for a trade company is to take care of the flow of the items from suppliers to the customer. To ensure the efficient flow of items a company should be able to manage its internal supply chain efficiently.

Essential for internal supply chain efficiency is the close co-operation and sharing of information between functions. Nowadays information technology provides the tools for a company wide communication and alignment of operations. However in order to maintain an efficient internal supply chain it is also necessary to apply measures that will provide constant feedback of the operations.

The case company is a trade company that operates in the field of industrial supplies. The case company wants to improve its internal operations and thus the aim of this thesis is to study the internal supply chain. As a trade company purchasing is in great importance to the operations thus it is to be studied in more detail. The research covers issues such as the relationship of internal functions, ways to improve internal co-operation and measures of internal supply chain. Integrated purchasing and factors affecting the purchasing are also covered in the theoretical part of the thesis.

The empirical research is a qualitative research and the information was gathered through interviews and observations in the case company environment. Three persons with expertise were chosen to be interviewed. An interview structure was drafted to assist the interviews. The interview structure consists of predetermined themes that cover issues about functional relationships, purchasing and measures of internal supply chain.

2 INTERNAL SUPPLY CHAIN

Increased competition in both domestic and international markets has led organisations to act rapidly to improve their internal processes to maintain competitiveness. Organisations need to respond to more demanding customer demands as higher quality, faster delivery and tailored products and services are expected with lower total costs. In order for an organisation to fulfil these demands they need to be involved in the management of both suppliers that provide the materials and with the end-customer; this idea drives the concept of supply chain. (Monczka, Trent & Handfield 2005, 4-5.)

The supply chain consists of all the activities that are related to the flow of product or service from its raw material to end customers through information, material and cash flows (Ayers 2006, 5). The supply chain can include multiple organisations and activities in which the materials move through from the first supplier to the end customer. Supply chains can be both short and long or simple and complicated because every product has its own unique supply chain. (Waters 2003, 7-8.)

The internal supply chain consists of functions that occur internally in the given organisation. Many businesses have multidivisional and global organisational structures that make the internal supply chain complex. Before implementing supply chain management practises the organisations should have an understanding of the internal supply chain. (Handfield & Nichols 1999, 42.) Most internal supply chains are constructed on a functional basis, meaning each function has its own responsibility (Christopher 2005, 263).

2.1 Relationship of functions

Organisations that are constructed on a functional basis suffer from a weak internal connection between departments; the work between departments and a supplier or a customer is conducted independently from other departments without internal

collaboration (Ayers 2006, 14-15). The activities are performed by one function and then passed to the next function without internal co-operation (Christopher 2005, 266). In these functional organisations information systems are arranged in accordance to single departmental needs and the evaluation of performance is usually based on departmental budgets (Ayers 2006, 14-15).

According to Rushton, Oxley and Croucher (2000, 101) it is easy to recognise problems that occur within individual function but it can be harder to recognise problems that occur between functions. Blame culture that usually exists between functions makes it hard to recognise the cause of a problem as functions are blaming each others. The interaction of functions, good communication and coordination is essential for efficient supply chain operations (Chopra & Meindl 2007, 16).

Fragmented supply chain creates difficulties to coordinate information flows through different information systems which in turn can increase the chance of error, uncertainty, delay and inefficiency. Logistics activities are related to each other and thus principles in one part affect operations in another. Double work and resources are wasted when functions are not aligning with each other. (Waters 2003, 35-36.) The fragmented logistics leads to poor communication and information flow between functions that eventually can lead to lower efficiency and bad customer service (Waters 2003, 37).

Functions and processes of an organisation contribute to the value chain of the organisation (Chopra & Meindl 2007, 24). The value chain consists of activities that bring value and profit for the organisation (van Weele 2002, 10). There are two functional areas - primary and support – in the value chain. The primary area concentrates on the direct flow of production such as operations and inbound logistics, while the support activities such as technology support the primary activities. (Lan & Unhelkar 2005, 187-188.) A single process or a function cannot guarantee supply chain effectiveness. Functions and processes in the value chain are highly related, so a failure in one part may lead to overall supply chain failure. To avoid supply chain failure organisations should design functional strategies that support one another. However if alignment is not achieved this might result as a conflict between functions. These

conflicts can eventually lead to different customer priorities in different functions and stages throughout the supply chain. (Chopra & Meindl 2007, 24-25.)

The absence of production process is a characteristic of a trade company. The value adding activities in trade and retail companies are low when compared to manufacturing. The foundation for trade companies is the exchange process of products between different parties. The primary process of a trade company is to take care of the flow of the product from manufacturer to the final customer. (van Weele 2002, 307).

According to Rushton, Oxley and Croucher (2000, 21) in an organisation there are interface areas where trade-offs are made between functions. A trade-off can be characterised as the achieved balance which is attained through giving up in one area in order to achieve benefits in another (Encyclopedia Britannica Inc, 2008). The following sub chapters will explain in more detail the trade-offs of functional relationships.

2.1.1 Inventory

The supply of a supply chain does not always meet the demand and that is the reason why organisations keep inventory. Inventory impacts to the flow time of material flow throughout its journey in the supply chain. (Chopra & Meindly 2007, 50-51.)

Decisions concerning inventory have a high risk and a high impact to the overall supply chain. Inventory supports many activities in the supply chain through the fulfilment of future demands. (Bowersox, Closs & Cooper 2007, 130.) According to Bloomberg, LeMay and Hanna (2002, 135, 142) functional areas can have disagreements about decisions concerning inventory, for example marketing prefers high inventory levels as it allows a quick customer response while financial department prefers lower inventory levels as carrying inventory is expensive.

Manufacturing is one of the areas that is affected by inventory planning. Inefficient inventory planning may occur as a shortage of material or component which in turn can

lead to changes in production schedules, additional cost and even to the closing of production line. As shortages occur they have an effect to the marketing and manufacturing plans and cause operational problems as well. (Bowersox et al. 2007, 130.)

Increased inventory is experienced across the organisation when individual functions are encouraged to optimise their own cost which is usually the case in functional organisations. Increased inventory effects negatively to financials and hides the visibility to the final demand. (Cristopher 2005, 264.)

2.1.2 Warehousing

A warehouse can be seen as a place to hold and store inventory, but it can also be viewed as "mixing inventory assortments to meet customer requirements" according to Bowersox, Closs and Cooper (2007, 212). Poor design or management of a warehouse system does not enable the organisation to achieve target customer service levels and the poor maintenance of stock can lead to high costs (Rushton, Oxley & Croucher 2000, 229).

Warehouse is a place where cost reductions and productivity improvements can be applied through integrated logistics. Customer service, supply of goods, and organisation's sales and marketing is affected by warehousing. The fluctuations in supply and demand are balanced with a warehouse. By consolidating materials and distributing them forward the warehouse supports production and by serving the customers it assists marketing. (Bloomberg et al. 2002, 172.)

2.1.3 Materials handling

The movement of raw material, work-in-process inventory, and finished products within a facility is called materials handling. Through effective materials handling safety, capacity of storage, service and productivity can be increased and cost, waste and labour reduced. (Waters 2003, 297.) Materials handling has an impact to the productivity through the requirements of personnel, space, and capital equipment (Bowersox et al. 2007, 242). As materials and products need to be moved at the right time with the right quantity to production, loading docks and terminals, it is the responsibility of materials handling to make sure that the right quantities and times are fulfilled (Bloomberg et al. 2002, 186-187).

2.1.4 Transportation

Waters (2003, 309) defines transportation as the responsible one "for the physical movement of materials between points in the supply chain". Transportation moves materials into warehouses and plants and finished products out from the plant to the warehouses and to the customer (Bloomberg et al. 2002, 94).

The location and availability of an inventory is dependent on the transportation. Transportation directs the geographical position of inventory and the timing and quantity of inventory in a certain place (Bowersox & Closs 1996, 29). Transportation is considered to bring value as inventory can be reduced through accurate product deliveries, storage and materials handling (Bowersox et al. 2007, 166). Organisational goals also dictate the type of transportation mode used. For example if an organisation aims to achieve good customer service level it has to consider what transportation mode to use in order for fast and reliable service. (Jayaraman 1998, 471-494.)

When the transportation of an organisation is managed independently from other operations it often is the "weakest element" of the supply chain according to Stank and

Goldsby (2000, 471-494). By co-operating transport decisions with other functions the "weakness" of transport can be eliminated. Co-operating and sharing information with purchasing, operations and customer service allows the transportation function plan its operations more efficiently and cost-effectively. In return the transportation department provides information about the capabilities and limitations to other functions, this enables that customer service failures are kept to minimal and unnecessary cost are avoided. (Stank & Goldsby 2000, 471 – 494.)

2.1.5 Other

Marketing and sales functions are involved in product development, price determinations, recording customer orders and in the product promotion to customers. Marketing and sales prepare production and materials handling sales forecasts that provide important information for the production planning process. (Brady, Monk & Wagner 2001, 6.) Marketing also acts as a link between functions and customers. Marketing analyses changing trends and potential volumes and then forwards this information further so that plans can be made accordingly. (Bloomberg et al. 200, 1-2.)

Accounting function plays an important role in the sales function as it needs to generate accurate and timely information about customer credits. Accounting and finance also record organisational transactions by recording accounts payables when raw materials are purchased and cash outflows when materials are paid. (Brady et al. 2001, 10)

3 INTERNAL CO-OPERATION

As discussed in the previous chapter separate internal functions create problems. The need for integrated management is required to solve problems, maximise value and minimise costs (Waters 2003). According to Baily, Farmer, Jessop and Jones (2005, 33)

"More streamlined approach to the flow of goods into, through, and out of the organisation" is needed. Important aim for any organisation is to make sure "production produces only what the marketing requires whilst purchasing supplies production with what it needs to meet its immediate requirements" (Christopher 2005, 270). Integrated management provides a better opportunity for the organisation to integrate strategies at all levels and to concentrate on the overall efficiency rather than functional efficiency (Baily et al. 2005, 33).

Co-operation and communication are the main characteristics for organisational integration. Co-operation is the creation of common goals and working together involving all the employees of different functions. Communication is a two-way flow of information, between teams and across functions (horizontal) and between senior managers, departmental heads and people on the shop floor (vertical). Technology is usually used to transfer the information between people. (Braganza 2002, 562 – 572.)

3.1 Internal integration

In a traditional structure each individual function has got own responsibilities with external sources. In the modern organisations there are networks where roles are more flexible and processes are created to support customer need and the supply management collaborates with the internal departments of the organisation. (Carter, Slaight & Blascovich 2007.)

Moncka et al. (2005, 98) defines integrations as "bringing different groups, functions or organisations together" to solve a common problem. The integration can be done either physically or with the help of information technology. The people involved in the integration are required to have a common sense of the end goal or purpose. Functional teams or cross-functional teams - where people from different functions work jointly- can be used in the integration process. Integration can also be extended to suppliers, customers or even both at the same time as work is done in cross-organisational teams. Integration provides benefits for the organisation as information, knowledge and expertise, and different point of views are shared. (Monczka et al.2005, 98.)

The internal integration includes the coordination of internal purchasing, engineering, operations, marketing and sales activities. Purchasing and other operational areas need to be aligned in terms of business strategy, performance metrics, and overall direction. (Handfield 2001.) A critical aspect for internal integration is sharing information among logistics, marketing and production. Information gaps lie between these functions and the integration of functions can close the gaps. (Rutner, Gibson, Vitasek & Gustin 2001.)

The integration process should be planned carefully as resistance might occur (National Research Council Staff et al. 2000, 37). Some people are more vulnerable to change and the need for communication and coordination across functional boundaries increases. Effective "buy-in" among personnel is essential for the success of internal integration. When an organisation moves towards more coordinated operations traditional bases for rewards need to change accordingly. Incentives are needed to support the broader view of performance. Aligning rewards and compensation with internal integration is one way to implement buy-ins. (Stank et al. 2001.)

Simplification can be introduced to support the coordination of internal operations. The day-to-day complexity and ongoing planning and analysis are reduced through information technology. (Stank et al. 2001.) To successfully integrate internal operations organizations should establish and implement standardised policies, procedures and practices to reduce uncertainty of operations (Bowersox, Closs, Stank & Keller 2000).

3.2 Team work

Organisations that are targeting to achieve high level of internal integration can use cross-functional work teams to simplify functional activities and make them more

manageable (Bowersox et al. 2000). Organisations can create mutual trust and commitment through team work (Heizel & render 2004, 375). Teams can be used to evaluate and select suppliers, develop global strategies and perform demand and supply planning (Monczka et al. 2005, 153).

However some negative aspect of team work can be identified. Trent (2005) states that teams can waste time and energy and enforce lower performance norms, cause conflicts and make bad decisions if managed and designed poorly. However Trent continues to state that if executed properly research indicates that team work can lead to better performance.

3.3 Structure

According to Bloomberg, LeMay and Hanna (2002, 218) the structure of an organisation is dependent on "size, product offerings, number of plants, sales figures, customer locations, corporate philosophy, and many other factors". A wide variety of different types of organisations can be found in the business environment. Organisations should tailor a structure that fits their own situation and not copy another organisation's model. (Quayle 2006, 54.)

Many organisations begin integration on a function-by-function basis focusing on functions which offer highest returns. Usually inventories, procurement, inbound logistics, manufacturing operations, and distribution are functions that are integrated, depending on the industry. (National Research Council Staff et al. 2000, 36.) A model of functional organisation is illustrated in figure 1.
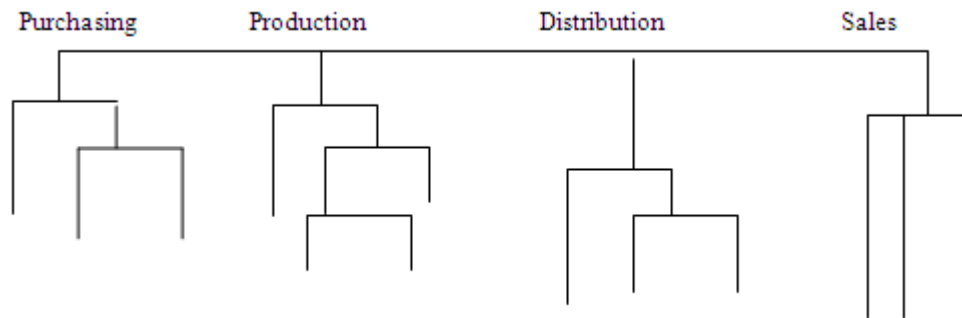
Figure 1: The functional organisation (Christopher 2005, 263)

Re-organising the organisation on a horizontal or market-facing basis creates an organisation that is organised around processes. The goal of a horizontal organisation is to manage the processes on an integrated basis. (Christopher 2005, 268.) Process can be defined as a set of activities that together produce value to a customer. The focus in process oriented approach is to organise activities around processes that are relevant to customers. Employees are encouraged to collaborate with co-workers in order to solve problems and cross-functional or cross-departmental project teams are used to do the work. (van Weele 2002, 9.) The process oriented approach allows the coordination of complex activities between functions and elimination of non-value-adding activities (National Research Council Staff et al. 2000, 36-37). A model of horizontal organisation is illustrated in figure 2.

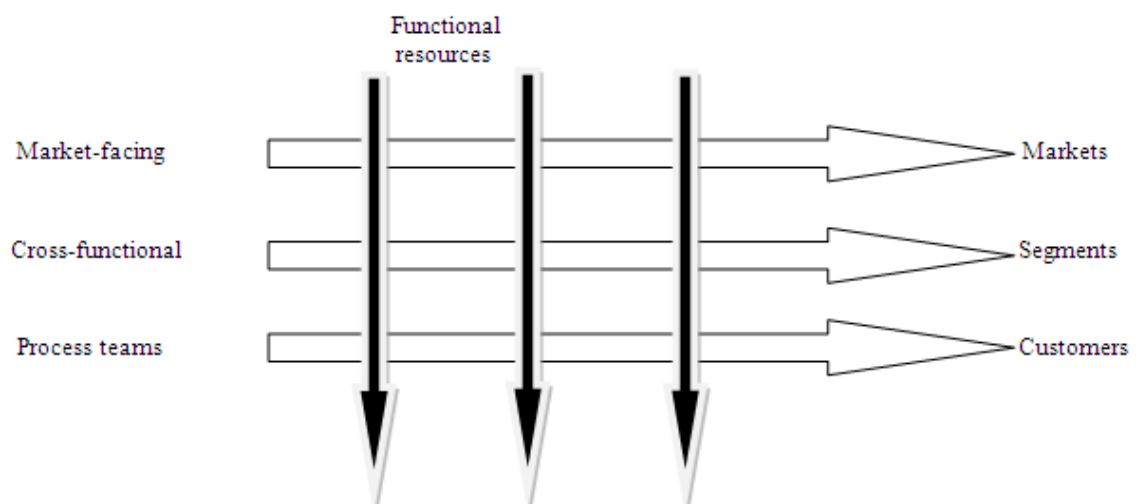Figure 2: The horizontal/process organisation (Waters 2006, 31)

The horizontal structure creates a self-directed environment where employees are responsible of their own work performance. The focus is on managing processes that

lead to higher productivity and information sharing that is rapid. Information technology provides the horizontal structure the tools to execute it. (Bowersox et al. 2007, 358.) Making employees' part of the horizontal organisation can increase the flexibility of operations. (Bowersox, Closs & Stank 2003.) Process driven organisational structures increase the visibility of market demand and enable faster supply chain response (Rushton, Oxley & Croucher 2000, 144.) The challenge is to manage horizontal processes that cut across functional boundaries as some activities may fall into the area of multiple operating managers. It can be difficult to maintain clear lines of authority and responsibility in process oriented organisation as the control is not clear. (Bowersox et al. 2003.)

Matrix structure is often used in cross-functional integration. The matrix structure employs two senior managers that share responsibility for an organisation. One of the senior managers (business) is responsible for financial and operational aspects of specific business units while the other senior manager (resource) is responsible for the management of organisational resources. The business manager has authority for work design and project control although the employees remain responsible to the resource manager. The matrix structure has been successfully applied to integrate across functions in professions such as, consulting and advertising. However the matrix model is more difficult to implement in manufacturing, distribution and retail organisations according to Bowersox, Closs and Stank (2003). The lines of authority and responsibility become unclear in the matrix organisation which can lead to conflicts within the organisation (Ballou 1999, 615).

3.4 Integrated logistics

Integrating the logistics of an organisation can work as a foundation for the integration of internal supply chain. Logistics consist of the process of planning, implementing and controlling the flow and storage of goods, services and related information from consumption to the customer requirement fulfillment. Logistics is the area where

improvements can be made to obtain competitive advantage for the supply chain. (Handfield & Nichols 1999, 46, 47.)

Logistical operations of an organisation should be considered as a single integrated function. In integrated logistics all functions work in align to achieve best possible result for the organisation. (Waters 2003, 37.) The aim of logistical management is to gain operational efficiency through integrating all material acquisitions, movements and storage activities (Heizer & Render 2004, 427). The integrated logistics not only involves the integration of logistics but also it includes the planning, allocating, and controlling financial and human resources that are needed to support manufacturing and purchasing operations as well as the physical distribution of goods (Daugherty, Ellinger & Gustin 1996, 25-33).

3.4.1 The integrated logistics process

The internal integration of logistics begins when organisation realises the value of logistical activities for the organisation. First separate functions implement improvements to efficient operations. The next stage is to integrate functions to co-operate. Continuous improvements are needed to enhance the organisation of logistics. (Waters 2003, 39.)

The integration process begins by one department taking the control over operations of materials management and production. The department will be responsible for the flow of raw materials into and through the organisation. A second department will look after the flow of finished goods by aligning marketing with distribution. The logistical integration is completed when the two departments form a single function that controls the logistical operations. (Waters 2003, 37.)

3.4.2 Aim and benefits of logistics integration

The aim of well planned and designed logistical processes should be the satisfaction of customer demand and expectations. The processes should be cross-functional and time-based as co-operation with other functions and time are important elements in logistical operations. (Rushton, Oxley& Croucher 2000, 101.)

Logistics that is integrated in the right manner will maintain desired customer levels while at the same time minimise total distribution costs. Integration of logistics that has been made successfully will bring many benefits to the organisation. Integration can increase the efficiency and productivity of an organisation when at the same time lower costs. Benefits are experienced as shorter lead times, inventory reductions, improved forecasting and scheduling and better customer service. (Daugherty et al. 1996, 25-33.)

3.5 Supply Chain Management

Supply chain management requires both internal functional integration and external integration. The internal supply chain integration involves the integration of logistics with other functional areas. The external integration requires the organisation to extend its logistical integration to trading partners by planning, executing and co-coordinating performance jointly. (Daugherty et al. 1996, 25-33.)

According to Ayers (2006, 10) "Supply chain management integrates supply and demand management within and across companies". The aim of supply chain management is to integrate business functions and processes both inside and outside the organisation in order to achieve more coherent operations. Supply chain management is responsible for the planning and the management of operations that are related to procurement, sourcing, operations and logistics management operations. Collaborating with other parties such as suppliers, intermediaries or and customers are part of supply chain management. (Ayer 2006, 10.) The supply chain management is involved in the

management of product, information and money flows of a supply chain (Moberg, Speh & Freese 2003).

3.6 Information Technology

Traditionally organisations are supported by fragmented information systems that support only operations of individual function. For example marketing has a marketing information system and production has a separate information system; both with own methods to process data and information. Information systems can be designed to share accurate and timely information between functional areas (Brady, Monk & Wagner 2001, 16, 4). Greater alignment is achieved through information systems that can support timely, accurate and automated flows of consistent information between functional areas. In order for effective integration information systems need to meet internal information needs and close gaps between logistics, marketing and production through information. (Rutner, Gibson, Vitasek & Gustin 2001.) Local networks or intranets are used to facilitate information by most organisations, although Internet is also an efficient way to provide information. (Waters 2003, 38.)

Highly integrated information system connects various internal functions in an organisation. Integrated information system can provide the access to inventory information throughout the supply chain and provide real time information. This type of information is available when a computer-based planning system between marketing and production processes is implemented. (Lee, Kwon & Severance 2007, 444-452.)

There are a number of information technology approaches that an organisation can apply into the integration process. Efficient training and communication are necessary to support the implementation of information technology. Before implementing information technology, processes need to be evaluated because policies and performance measures may need to be modified to be consistent with the integration. (Stank et al. 2001.) Although some of the information technologies that can provide competitive position are too complex and costly for small and medium-sized enterprises

(SMEs). However many beneficial capabilities can be obtained through Internet technologies. (National Research Council Staff et al. 2000, 74.)

3.6.1 Goal and benefits of IT

The main goal of IT in the supply chain is to provide information that follows the physical path of products and allows planning, tracking and estimation of lead times based on real time information. The access to this kind of information should be made available to all parties involved. (Simchi-Levi, D., Kaminsky & Simchi-Levy, E. 2003, 266.)

IT consists of software, hardware and people that collect, analyse and act upon the information through the supply chain. The efficient use of information system can make the supply chain more responsive and efficient. Efficient decision making and execution of processes are necessary for supply chain performance which in turn is affected by information. (Chopra & Meindl 2007, 45, 482, 484.) The IT system collects data across functional and geographical boundaries within the organisation. The IT systems within the organisation need to be flexible to adjust supply chain strategy changes and alignment of systems is necessary. (Simchi-Levi et al. 2003, 267-269.)

IT creates opportunity for greater knowledge and visibility across the supply chain making it possible to replace inventory with information. Information technology also provides better coordination of manufacturing, marketing and distribution through enterprise resource planning and reduced lead times through coordinated logistics information systems. Information systems that provide real-time visibility in the form of forecast and action in functional areas provide the opportunity for better planning and decision-making across the organisation. (Rutner et al. 2001.)

3.6.2 IT structure

The IT infrastructure of organisation supports databases, operating systems and networks (Handfield & Nichols 1999, 16). The infrastructure of IT consists of interface devices, communications, databases and system architecture. Most commonly used interface devises are personal computers, voice mails and Internet devices. The interface devises can be connected into an internal system such as Intranet or to an external private company network or the Internet. Wireless communication is fast becoming the primary communication mean as it is replacing phone links. The Internet provides organisation a simple cross-organisational mean to communicate through electronic mail (e-mail). (Simchi-Levi et al. 2003, 274-276.)

Internal information flows and systems of a supply chain document and recapture important data and control and execute physical and monetary flows. The information systems provide support to planning activities and higher level tactical and strategic decision making. The information flows and systems can form linkages with customers and suppliers. (Monczka et al. 2005, 590-591.) There are many technologies that enable information sharing and analysing in the supply chain. Organisations can decide which technology systems to implement and integrate into their operations and to their partner organisations. (Chopra & Meindl 2007, 57.)

3.6.3 E-commerce and Intranet

E-commerce makes the interaction between companies and within a company possible (Simchi-Levi et al. 2003, 279). In e-commerce computer networks, primarily Internet is used to buy and sell products, services and information. E-commerce can be used to track consumer behaviour in marketing functions and make collaboration possible between product design and production function and speed transaction in accounting function. (Heizer& Render 2004, 437.)

Intranets are organisational internal networks that use same technology foundation as Internet uses. Intranet enables the linking of incompatible groups of computer and improves the internal information system. Employees are linked to organisational information such as product prices through the Intranet. (Handfield & Nichols 1999, 34-35.) Intranets provide a communication environment that is relatively secure method to move business processes on-line. Intranets enable the generation of timely and complete reports throughout the entire organisation. Intranets also provide paperless internal processes as many paper intensive purchasing and supply management processes such as ordering and receiving can be converted to paperless with the help of Intranet. (Cavinato, Kauffman & Goldstein 2001, 418-419.)

3.6.4 Enterprise resource planning (ERP)

The ERP system creates organisational environment that supports operational integration through a shared database (Brady et al. 2001, 16). The integrated collection of computer files is known as database. Database is effective way to store data and it is a prerequisite for enterprise resource planning (ERP) system. (Monczka et al. 2005, 601.)

Monczka et al. (2005, 594, 599) define enterprise resource planning as a comprehensive system that integrates business transactions and reporting systems via single integrated system. ERP enables the cross functional information and communication sharing and it provides the organisation with tools for tracing resources such as people, processes and technology (Monczka et al. 2005, 598).

The ERP system is the core for most organisations logistics information system. The ERP system supports current and past data and process transactions to initiate and monitor performance. The monitoring and tracking of critical activities such as order fulfilment can be done with the use of ERP system. (Bowersox, Close & Cooper 2007, 101-102.)

ERP systems usually are expensive that require a lot of tailoring for each organisation. The implementation also requires high degree of training at operative level and consultancy. The implementation of ERP system needs to be thoroughly planned and resources should be carefully allocated for the execution of the system. (Rushton et al. 2000, 485-486.)

4 PURCHASING

Purchasing function is responsible for acquiring all the materials for a company. Purchasing refers to the actual buying whereas a broader term of procurement can be used for the acquisition of materials. Often the two terms are used interchangeably, however procurement is considered to be a wider term including purchasing, warehousing, materials handling and transport among other issues. (Waters 2003, 228.)

The responsibility of purchasing is to determine when materials, products or service are needed and from which sources the goods are acquired (van Weele 2002, 14). Rather than concentrating just on ordering and buying the purchasing function has a more strategic emphasis and it is concentrating activities such as supplier development and reduction of total cost. (Baily et al. 2005, 11).

The actual purchasing cycle consists of different stages that differ in every organisation (Waters 2003, 237). The purchasing cycle is not limited to single goods and services but it can concern large variety of goods and services (van Weele 2002, 22). In short the purchasing cycle begins by recognising a need for purchased material (Waters 2003, 237). Department may place a purchase request for purchasing or the order may be placed through an information system that is then reviewed by purchasing. The second stage in the purchase cycle consists of the identification of the supplier. The complexity of identifying a supplier depends on the type of purchase. After the suppliers are identified one or more suppliers are chosen to supply the goods. The purchasing then

qualifies and places the order. (Bloomberg et al. 2002, 15.) The goods are inspected, inventory is updated and the goods are released for use after they have been received (Waters 2003, 238).

4.1 The role and importance of purchasing

The role of purchasing department varies between organisations. The responsibilities, tasks and competence of a purchasing department in a larger company usually are more professional whereas smaller companies can have a specialist in the charge of purchasing tasks. (van Weele 2002, 40.)

In the past purchasing was considered to be more of a clerical job involving the buying of materials. Nowadays a greater value is placed on purchasing and it is considered an important management function. The importance of purchasing becomes greater as customers become more demanding, the number of suppliers used decreases and the use of Internet increases. (Waters 2003, 230.) The potential for financial benefits also increases the value of purchasing. Purchased parts, components and supplies present typically 40 to 60 percent of the sales of the end products (Ballou 1999, 415). Because purchasing controls a dominant share of organisations´ revenue money it is capable of impacting on the overall profitability and financial success of organisation (Pooler, H., Pooler, D & Farney 2004, 7). Feasible purchasing strategy provides an opportunity for substantial money savings in purchased goods and services (Bowersox et al. 2007, 81).

Purchasing is an important function in every organisation as it is responsible for the continuous supply of needed materials (Waters 2003, 229). Purchasing drives cost effectiveness and operational effectiveness which both are important for organisations. Purchasing function practises cost effectiveness by obtaining lower costs through good negotiation skills and strong relationships with suppliers. Operational effectiveness is obtained for example through supplying the organisation with good quality materials at the required time. (Bloomberg et al. 2002, 11-12.)

In trade organisations the purchasing together with logistics is in major importance. Because there is no production function the time between the purchase and sale is very short. Since the buying of goods may determine the sales potential for a specific product some trade organisations integrate their selling and buying functions. (van Weele 2002, 307-308.)

Properly developed purchasing can make supply chain management improvements in operational, tactical and strategic level. On the strategic level purchasing makes long-range planning, predicts availability and sets policies. On a tactical level purchasing is involved in the supplier negotiations, staff development and other issues. On the operational level purchasing conducts day to day tasks such as handling requisitions and quotations. (Baily et al. 2005, 21, 32.)

4.2 Objectives

The main objective for purchasing is to acquire material at the right time, in right quality and quantity, from the right source, at the right price. The responsibility of purchasing is to maintain relationships with existing suppliers and to develop relationships with optional suppliers as an alternative or to cover arising demands. The purchasing should co-operate with other functions within the organisation by providing and sharing necessary information for the organisation to run its operations effectively. (Baily et al. 2005, 3-4.) To achieve co-operation it is essential for purchasing to develop relationships and work closely with other functional groups such as marketing, manufacturing, engineering, technology and finance (Monczka et al. 2005, 32). In order for purchasing to achieve its objectives it should make policies, procedures and develop its staff accordingly (Baily et al. 2005, 3-4).

The objectives of purchasing functions should be based on the company's overall objectives; the objectives for purchasing can include objectives that relate to cost reduction, reduction of the supplier base, improving product quality or lead time reduction, among other issues. The purchasing activities are then controlled, managed and directed through the purchasing objectives. (van Weele 2002, 103.)

Pooler, V. and Pooler, D. (1992, 4) suggest that the purchasing should establish an objective that ensures the flow of company's operation through the purchasing of goods, supplies and services. In order for purchasing to maximise its contribution to the company's overall performance the purchasing should also have an objective that relates to the control of money flow through the operations. The objectives and measures for purchasing should be targeted to drive behavior and performance in a way that when targets are achieved, the purchasing and business objectives are mutually met. The efficiency and effectiveness of employees can be improved through a clear identification and communication of roles and responsibilities. To achieve a common outcome the strategic and tactical plans of purchasing and organisation should be developed in a complete agreement. (Cavinato, Kauffman & Goldstein 2001, 299-300.)

4.3 Policies and Procedures

Top management can clarify and communicate objectives through policies. Policies are usually written and formal although unwritten and informal policies can exist as well. Policies can act as a framework for decision making and action that controls the employee performance. In order for a policy to be effective it should be action oriented, well understood, timely and current, guide problem solving and the procedures should apply to all employees. (Monczka et al. 2005, 72-73.)

Purchase procedures refer to the way a certain purchase transaction is carried through from the beginning to the end (Zenz 1994, 37). Procedures are "how-to" instructions that detail functional tasks or duties. Every organisation can develop their own unique procedures according to their requirements. Procedure manuals are developed to guide purchasing personnel and to provide consistency by illustrating activities that are required to perform certain task. The procedures should be accurate and simple that encourage people to act in a responsive and timely manner. Both policies and procedures need to be reviewed and evaluated continuously. (Monczka et al. 2005, 88.)

4.4 Purchasing organisation

The organisation of purchasing depends on the type and size of the organisation. A single buyer might be responsible for all purchases, policy and administration in a small company whereas in a medium-sized company there might be departments with buyers. (Waters 2003, 231.) The focus of the purchasing departments' structure should be on vital operational aspects such as speed, accuracy, flexibility and responsiveness (Cavinato et al. 2001, 302).

Organisations can compromise between buying everything locally and buying everything centrally, to achieve advantages of both types. Baily et al. (2005, 76) recognise three ways of organising the buying: complete decentralisation, complete centralisation and a combination of the two. The following sub chapters will provide more detailed information about the organisation of purchasing.

4.4.1 Centralised purchasing

Centralised purchasing is the purchasing of all items through a single centralised department or operating site (Waller 1999, 462). In centralised purchasing a central purchasing department can be found at the corporate level. Suppliers are selected centrally and the negotiations and contract are also managed centrally. (van Weele 2002, 239.) Through centralised purchasing larger purchasing volumes can be bought which will effect to the negotiation position of the organisation which can result in a better economic condition. Centralised purchasing also facilitates the internal co-ordination between purchasing and different departments of the buying organisation and a supplier. (Gadde & Håkansson 1993, 123-124.)

Having a centralised purchasing enables the organisation to have a larger purchasing department which results to greater staff specialisation. For example within the purchasing department there can be specialist groups concentrating on buying only certain items. Specialist staff creates an opportunity for lower materials cost and higher

purchasing competence. Administrative costs, transportation and overall costs can be reduced by consolidating small order together, which is possible in central buying. (Waller 1999, 462.) The centralised purchasing will also eliminate duplicated effort and provide suppliers with consistent information through a single point of contact. (Waters 2003, 231.)

Organisations that work over a wide geographical area can have problems if the buying is just centrally led. Use of local purchasing has advantages as local buyers have better knowledge about local conditions and better relationships with suppliers. (Waters 2003, 231.)

4.4.2 Decentralised purchasing

Every function in the organisation makes its own purchasing decisions in a decentralised purchasing (Waller 1999, 462). Decentralised purchasing can be found in companies that have business unit structure. All business units are responsible for their own financial results thus the unit is completely responsible for the purchasing activities of the unit. The disadvantage for decentralised purchasing is lack of consistency, for example units can have different purchase conditions for the same items as each unit negotiates individually with the suppliers. Decentralisation may lead to internal competition between business units in case the supplier does not have enough capacity to produce the needed items. (van Weele 2002, 238.)

Purchasing that is organised in a decentralised way ensures closer coordination with local organisations. Decentralised purchasing is more flexible in responding to problems as it is easier to handle a problem locally than from a distant office. Local buyers will also have better knowledge about the local markets and specialist knowledge about local needs. (Qauyle 2006, 63.) Decentralised purchasing is responsiveness and it enables fast respond to customer and user requirements (Monczka et al. 2005, 148).

4.4.3 Combination of Centralised and Decentralised purchasing

The advantages of a centralised purchasing are the disadvantages of decentralised purchasing and vice versa. A organisation may use a combination of both ways of organising the purchasing to obtain the benefits of both approaches. In the combination approach the central office is responsible for determining the policies, standards and procedures. The central office is also responsible for negotiation of contracts for common materials used by the buying groups. Other responsibilities include co-ordination of inventory, creating contracts for imported and exported materials among other issues. (Baily et al. 2005, 77-78.) The structure of centralised and decentralised organisation can consist of a central purchasing department at a corporate level, with individual buying departments (van Weele 2002, 240).

4.5 Purchasing integration

The expertise of purchasing is required when other functions of the organisation place demands on the purchasing. The purchasing function must work closely with other functions as purchasing operates as a link between the organisation and with external sources. (Bloomberg et al. 2002, 16.)

Before purchasing can integrate externally it has to integrate its operations with other functions in the company (Monczka et al. 2005, 98-99). Many organisational activities are affected by purchasing work. Purchasing is closely related to production and materials handling because purchasing is responsible for acquiring the raw materials and components needed. (Gadde & Håkanssons 1993, 13-14.) Purchasing and integrated logistics have to be coordinated to ensure the flow of products through the supply chain. The purchasing department can control and manage the integrated logistics or the purchasing can be placed as a part of the integrated logistics. (Bloomberg et al. 2002, 17.)

As purchasing becomes a part of the internal integration, emphasis shifts to cross functional problem solving. The purchasing organises the purchasing around internal processes as the focus becomes more process oriented. Purchasing becomes more involved in strategic issues and the strategic importance of purchasing is recognised. The work in integrated purchasing can be organised through cross-functional teams and the information systems are aligned with the organisational systems. (van Weele 2002, 112.)

The third chapter dealt with the internal integration of an organisation. The purchasing function should be part of the organisational wide integration. To further improve the purchasing the organisation can choose to extend the integration to external parties.

Close co-operation between purchasing and the suppliers improves the supply chain operations and can lead to substantial improvements in performance. The integration between buyers and sellers usually involves alliances or partnership with the selected suppliers to reduce cost and improve operational integration. The integration can be conducted in different forms. The integration can involve giving the supplier access to sales and ordering information. This kind of integration allows the supplier to have continuous information about product sales, thus the supplier is able to response to buyer requirements in more effective way. The more information is provided to the supplier the further the supplier can plan the operations and save costs. Further integration with suppliers can be conducted by working together. The purchasing and supplier can identify processes that are related in maintaining supply and find ways to redesign those processes. The tight co-operation can be established by using information technology to reduce order time and eliminate communication errors. The aim of operational integration is to lower cost, eliminate waste and develop relationships that allow mutual improvements for both parties. (Bowersox et al. 2007, 84, 86.)

Simchi-levi et al. (2003, 226) state that sharing of future plans, aligning objectives and sharing technologies is important for supplier integration. The next sub chapter will go through some technologies and systems that can be applied for sharing information with external parties and creating visibility through the chain.

4.6 Purchasing and information technology

Electronic commerce provides purchasing and supply managers an improved tool to obtain information, improve communication and find new ways to identify and qualify sources. The use of electronic commerce eliminates paperwork, saves time and increases efficiency, improves supplier management and reduces costs. Management of the supplier base and service quality can be enhanced with the help of electronic commerce and improved communication. (Cavinato 2001, 412.)

Electronic data interchange (EDI) is a computer-to-computer based system that allows exchange between companies. There are two types of EDI systems: One-to-many system in which an organisation is linked with other organisations and a clearinghouse system, in which third party sellers are used for translating document from industry format to buyer format. (Zenz 1994, 60.) Organisations are able to place orders in a faster manner with supplier through the use of EDI system. The lead times of products can be reduced as the use of EDI creates faster transactions and thus decreases the time needed to provide products for the customer. (Chopra & Meindl 2007, 57.) An example of an EDI system is electronic point of sales (EPOS) that transfer timely information to the supplier from the point of sales. The EPOS system provides the supplier with valuable information such as effect of price increases or decreases to the sales and information about the products success. (Baily et al. 2005, 321.)

Vendor managed inventory (VMI) is a new way to manage inventory. The organisation shares information about the actual usage or sales of the product, on current inventory levels and details of any additional marketing activity such as promotion to the supplier. Typically the customer does not pay the inventory before it is sold further. The supplier can plan when to supply the organisation with goods on the basis of the information received. Inventory levels can be significantly reduced and risk of supply not matching to demand diminishes with the use of VMI. The supplier can plan more accurately production and distribution as the access to real time information provides the opportunity for that. (Christopher 2005, 6.)

5 MEASURES OF EFFECTIVENESS

Ayers (2006, 491) defines metric as "number for measuring and reporting key performance indicator of business, the department, the workgroup, the product line, or the individual." Metrics are designed to guide and drive organisational actions towards improvements. Metrics can be applied to provide direction and identify areas that need attention. The setting of priorities, measuring process and rewarding of people and teams can be supported with the use of metrics. Metrics also shift the focus into key issues that need attention and help to communicate these key issues. (Ayers 2006, 491.) In other words measures support better decision making and communication within departments and between departments. Measures also provide feedback for performance and motivate and direct people. (Monczka et al. 2005, 630.)

Most measurements are executed on the functional level meaning each department measures own performance in their own terms. The members of the department are then evaluated against departmental objectives that are based on the goals. Measuring on a functional level leads to improvements in a one department but it does not improve overall efficiency as functional measures often conflict with broader organisational goals. (Lapide 2000)

Organisations that are cross-functional and process oriented rather than function based should have both function based measures and process based measures. The primary focus of measures should be on the overall performance of process and the functional measures should provide deeper functional information. (Lapide 2000)

A good measure is objective and it is connected to the supply chain objectives. Measures should be measurable and clear, in order for all the participants to understand the measures. The measurement should only focus on the important factors and on the current performance rather than past performance. (Waters 2003, 205.) Effective

measures communicate how well each supply chain process is performing, indicate the areas where improvements are needed and help to point out problems and decide where improvement efforts should be focused (Cohen, Kulp & Randall 2007). Controlling and measuring are most efficient ways to influence on improving performance level, making changes and motivating people (Iloranta & Pajunen-Muhonen 2008, 432). The aim is to design measures that are aligned with the supply chain performance rather than to the control of employees (Lapide 2000).

5.1 Development of effective measurement

Development of an effective measurement and evaluation system begins by determining what performance to measure. The selection should relate on the organisation's goals and objectives. The next stage is to develop specific performance measures which should be objective relying on quantitative data and clear in order for employees to understand the requirements in order to drive towards the desired outcome or performance. Third stage is to set realistic standards for each measure by using either past data, external analysis or internally derived goals which include internal comparison of departments and finding best internal performance level. Before implementation education and training has to be provided for the employees and the frequency for the performance reporting must be decided. After the implementation a continuous reviewing of the measures should be conducted. (Monczka et al 2005, 644.)

Even though an organisation can have departments in different geographical locations with multiple processes and tasks the number of measures should be limited (Lapide 2000). Organisations should choose those measures that provide most benefit and information and provide a balanced view of the performance throughout the supply chain (Hofman 2004). Measures need to be consistent with each other and the measurement process should encourage better performance in the light of rewards (Ayers 2006, 491-492).

The measuring and controlling process should not form into too time consuming activity. The benefits of the measurement should be larger than the cost of the

measurement. The evaluation and monitoring process should be conducted in both short term and long term periods. (Iloranta & Pajunen-Muhonen 2008, 451.)

5.2 Types of Measures

Performance measurement is essential for achieving excellence and providing strong foundation on which to construct excellent supply chain skills (Hofman 2004). There are multiple measures and evaluation systems of supply chain performance. Most of these measures can be placed on two broad categories: effectiveness and efficiency. Measures based on effectiveness have a goal or standard that is established beforehand. The result of effectiveness measure is dependent on what extent the goal or standard is met through a decided course of action. (Moczka et al. 2005, 629.) Monczka et al. (2005, 629) refer efficiency as "the relationship between planned and actual sacrifices made to realise a previously agreed-upon goal". These measures usually connect some type of input to a performance output. However it is common that all measures have a standard or a target which the performance results or outcomes are evaluated against.

Financial measures tend to focus on past rather than future and are not directly tied to operational effectiveness or efficiency. Financial measures are insufficient to measure supply chain performance as they do not relate to strategic performance and these measures should be rather used to asses organisations financial health. (Lapide 2000.) Measures that provide integrated perspective are needed to measure supply chain performance and effectiveness. The integrated measures have to be consistent across the organisations functions. (Bowersox et al. 2007, 383.)

The supply chain metrics should be both financial and non-financial. The supply chain metrics have to convert financial objectives and targets into effective measures of operational performance. The supply chain metrics also need to convert operational performance into forecasts of future earnings or sales. (Cohen & Roussel 2004, 187.) According to Cohen and Roussel (2004, 191) an effective supply chain metrics program should have a balance of measures that are both internally focused and customer-facing.

Both functional and cross-functional metrics should be applied to measure innovation and continuous improvement of the supply chain.

Performance of the supply chain can be measured with perfect order, demand forecast analysis and with supply chain management costs (Hofman 2004). Bowersox et al. (2007, 383, 385) identify cash-to-cash conversion as a supply chain measure among other types of measures. A perfect order is an organisation's commitment to zero defects in logistics and the metric measures the performance of overall logistics (Bowersox et al. 2007, 382). The demand forecast analysis compares the difference between forecasted and actual demand. The supply chain management measures operating costs that consist of direct purchasing costs, manufacturing operating costs, transportation costs, warehouse operating costs, inventory holding costs and customer service operating costs. (Hofman 2004.) Cash-to-cash conversion is a measure of an organisation's effective use of cash. It measures internal process and provides an integrated perspective of an organisation's commitment of financial resources to inventory. (Bowersox et al. 2007, 383.)

5.2.1 Logistics measures

It is important for an organisation to measure the performance of integrated logistics because without measurements it can fail. The performance of both integrated logistics activities and integrated logistics manager should be measured. There are different ways to measure the performance of integrated logistics; most techniques involve the measuring of cost, productivity or service. It is more difficult to measure the performance of logistics manager than the integrated logistics, as it involves measuring the performance of a person. However line management ability, problem-solving ability and project management ability are used as measures of integrated logistics manager. Comparing the performance goals to person ability to control day to day operations is a way to measure the line manager's ability. (Bloomberg et al. 2002, 229.)

There are a number of ways to measure logistical performance. The logistics performance measures can be indirect measures that are linked to finance, such as the return on assets. Direct measures are recommended to be used when measuring logistics activities as they provide non-financial information, for example the number of tonnes delivered or stock turnover. (Waters, 2003. 197.)

5.2.2 Integrated measurement

Integrated measurement systems are required to measure the supply chain capabilities and logistics performance. Target is to measure operations both internally and externally among the supply chain members. Timely feedback is a requisite for an efficient measurement system, which enables management to take repairing action and to obtain good performance results. The integration of measurements requires cross-functional measurement vision and multiple measures that capture cross-functional performance of the supply chain process. The integration of measurements requires also sharing accurate performance information on a regular basis with all the supply chain members. The focus of these integrated measurements should be on providing value to the end customers. The performance measures should also be aligned with internal budgets and internal and external reward structures. (Stank et al. 2001.)

To build integration oriented organisation the performance measures must be aligned with the information system. Both managers and employees pay a lot of attention to what is being measured, thus the performance measures should be clearly communicated to everyone throughout the company. Performance measures need to be consistent with the goals and programmes that are communicated to the employees. An effective performance measurement system monitors and promotes the company's progress towards a more competitive position. (Fawcett, E & Fawsett, A. 1995, 24-42.)

5.3 Balanced supply chain scorecard (SCOR)

The balanced supply chain scorecard forms a single framework from the integration of business process engineering, performance measures and leading practises (Bolstorff & Rosenbaum 2003, 2). The integrated cross-functional framework will provide a good insight on which of the processes are weak and which strong (Ayers 2006, 260). The SCOR integrates performance measures of both financial and operating performance that are applied at all levels of the supply chain. Overall supply chain objectives and strategies are connected to supply chain wide performance measures with the support of SCOR. (Handfield & Nichols 1999, 64.)

A key principle of the SCOR approach is that the measures should be aligned with the strategic objectives; this can be done with the support of information system. However the objectives differ in organisations as objectives depend on the competencies of the organisation and the stage of development. For example mature organisations should concentrate on developing the cross-functional excellence and focus objectives that are aligned with the strategy. (Lapide 2000.)

The SCOR focuses on four key performance areas each area having own objectives and strategies. The key performance areas are financial, customer, business process and learning and growth areas. (Handfield & Nichols 1999, 64.)

5.4 Benchmarking

A baseline has to be created for assessment and evaluation. This requires realistic and accurate assessment of how a supply chain's functional, strategic, operational and financial performance rank against an organisation of world-class best standards (Cavinato 2006, 144.) The aim of benchmarking is not only to see the differences between operations but to identify the reasons for why some operation is the best and then establish ways to operate in the best way (Rushton et al. 2000, 452-453).

Quayle (2006, 69) recognises three types of benchmarking: internal, competitive and functional benchmarking. The internal benchmarking is conducted within a group by first identifying best practise within a certain group. Competitive benchmarking signifies benchmarking the organisation to a competitor. (Quayle 2006, 69.) Organisation performance is compared to those with the best results achieved in the industry (Waters 2003, 207). However it might not be easy to access reliable information about the competitor and there is a need for similarities between the organisations e.g. size of the organisation. Functional benchmarking includes the comparison of certain functions. The functional benchmarking can be conducted within the organisation against best in class or best in the industry. (Quayle 2006, 69.)
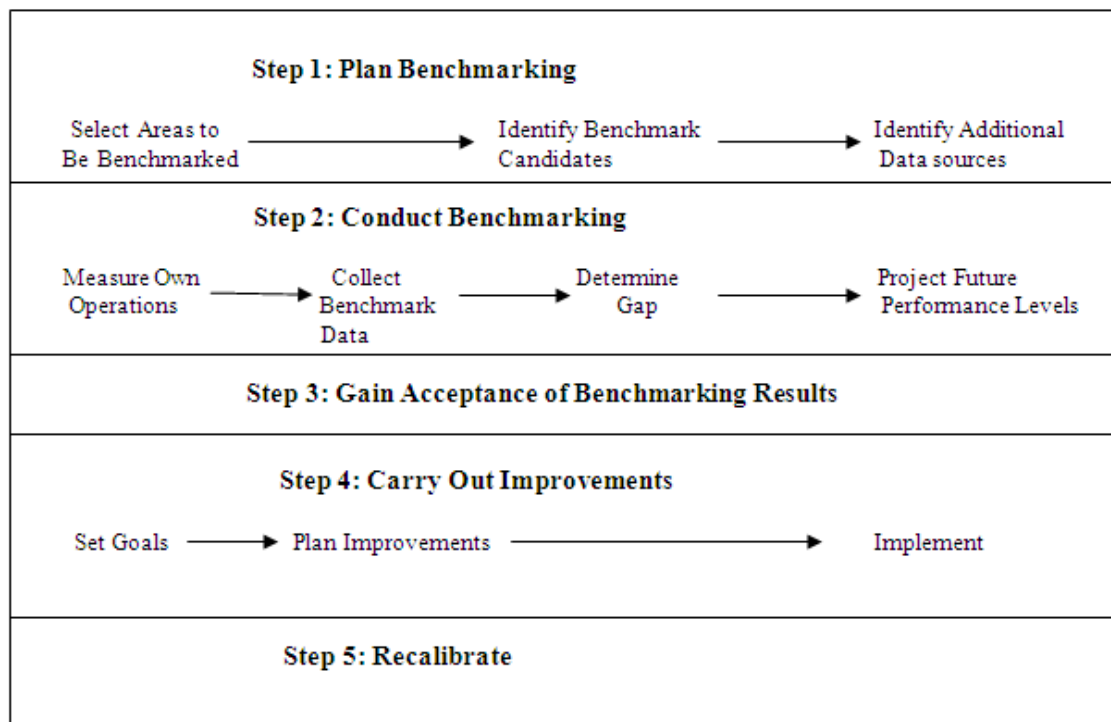
Figure 3: The Benchmark Process (Bloomberg et al. 2002, 279)

The figure 3 illustrates the benchmarking process. The benchmarking begins by drafting a plan about the process that includes selecting the areas where benchmarking is applied and best practises are identified as sources for comparison. In step two the actual benchmarking process is conducted and information about the organisation's own operations is collected and further compared to the best practise. The gaps between the organisation and the best practise will guide the organisation to set future action towards

better performance. Improvements are then carried out according to the plan and the process can be repeated.

6 RESEARCH OBJECTIVES AND CONCEPTUAL FRAMEWORK

6.1 Research aim and objectives

The aim of the research is to study the internal supply chain of the case company. The objective is to find out the relationship of internal functions and to identify ways to improve the co-operation of functions. The research also strives to find out what factors affect the integrated purchasing and ways to measure effectively the internal supply chain.

6.2 Research problems

The research problems stem from the case company's need to know more about internal supply chain and purchasing in order to improve their internal operations.
The research problems of the thesis are:

1. What is the relationship of functions in the internal supply chain?
2. How can the co-operation in the internal supply chain be improved?
3. What factors affect the efficiency of integrated purchasing?
4. What measures can be taken to improve the internal efficiency?

6.3 Conceptual framework

The conceptual framework illustrates the internal supply chain and the functions that are included in the internal supply chain. The emphasis is on the purchasing function as it is in importance for the case company. The factors affecting the purchasing impact the purchasing function as seen in the box in the left. Communication flows within the internal supply chain and through to the customer and back. The figure illustrates that the information systems can be extended from internal supply chain to include the customer. The communication and information flow is a two-way flow from the internal supply chain to the customer and vice versa. The measures of effectiveness are applied throughout the internal supply chain to measure the internal effectiveness of the operations.
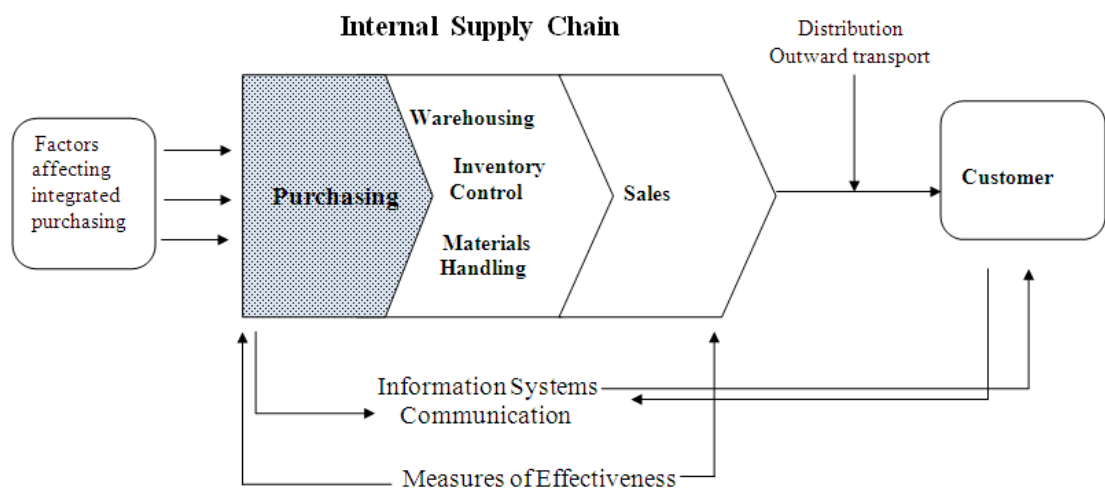
Figure 4: Conceptual Framework: The internal supply chain   (Turpeinen 2008)

6.4 Introduction of the case company

The case company is a small to medium sized trade company that employs approximately 25 people. It was founded in 1947 and is located in Pori, Satakunta region. The main business operations of the case company are reselling industrial supplies and the repair and maintenance service of electrical motors. The case company provides a wide variety of industrial supplies such as laurel, tools and industrial machines to name a few.

7 RESEARCH METHODOLOGY

According to Silverman (2001, 11) research methods are techniques that take on a specific meaning according to the methodology in which they are used. The selection of a research method is important as the chosen method will influence the research questions, analysis, data generation techniques and the final goal of the research. The most used research methodologies are quantitative and qualitative ones. The latter methodology is used in this thesis.

Qualitative research strives to generate a general holistic picture of the researched (Mason 2002, 1). Qualitative research tries to understand why certain circumstances are the way they are in a particular environment and the behavior of people in the environment. Qualitative research consists of collecting, analysing and interpreting data by observing what people do and say in natural settings. Opinions, experiences and feelings of individuals are concerned to provide subjective data. The process of qualitative research is inductive meaning the researcher develops new concepts and theories from the researched. (Hancock 1998, 1-2.)

Qualitative data is collected through personal one to one interviews, group interviews and/or by observation. The sample size of participants is small as the nature of data collection is a time consuming process. The qualitative method generates rich and valid data that will provide a deeper insight into the studied phenomena. In qualitative data analysis the information is used to describe the phenomena and to present what it means in order to understand it. (Hancock 1998, 2, 9&16.)

The process of a certain activity is the main concern in a qualitative research rather than the outcomes. The researcher is the primary tool for data collection and analysis rather than questionnaires or machines that are used in quantitative research. The qualitative research is conducted in natural settings meaning the researcher goes to the people,

setting, site or institution to observe or record behavior in its natural environment. The understanding of studied is gained through words and pictures and the researcher is interested in the process thus making the research descriptive. (Siegle 1994.)

The quantitative research is concerned with circumstances that can be observed and measured in some way. The observations and measurements are made objectively and can be repeated by other researchers. Quantitative research is a deductive method meaning it tests theories that have already been proposed. (Hancock 1998, 1-2.) Quantitative research involves a large number of respondents where options given have been predetermined. The measurements in quantitative research are objective, quantitative and statistically valid. (Anderson 2006, 1.)

The quantitative data analysis involves counting frequencies of variables and differences between variables. The analysis also involves making statistical estimates of the importance of the results and the probabilities that they did not occur by chance by comparing one measurement with others. (Hancock 1998, 16.) Quantitative research method provides results which are quantifiable (Verma & Mallick 1998, 4).

7.1 Qualitative data collection

As mentioned in the research methodology the main methods of collecting qualitative data are individual interviews, focus groups or by observation. Qualitative data can also be obtained with the use of other methods such as studying documents. Qualitative information can be collected from policy documents, mission statements, annual reports and minutes of meetings. (Hancock 1998, 13.)

One of the most common forms of data collection in a qualitative research is interviews (Mason 2002, 63). Reliable and valid data for the research can be obtained through interviews (Saunders, Lewis & Thornhill 2003, 245). According to Saunders, Lewis and Thornhill (2003, 251) interview allows to answer to a large number of questions whether complex or/and open-ended questions. Interviews can be both highly formalised and structured, using standardised questions or informal and unstructured

conversations. Standardised or predetermined questionnaires are used in structured interviews. In semi-structured interviews predetermined themes and questions are used to attain information, although themes and questions may vary from interview to interview. Unstructured interviews are informal in-depth interviews where no predetermined list of questions is used. However the researcher must have a clear idea of what they want to research. Interviews can be conducted through various means such as face-to-face basis or between telephone and focus groups or email. In qualitative research semi-structured and in-depth interviews are used to collect data (Saunders et al. 2003, 246-248.)

Face-to-face semi-structured interviews were conducted in the case company to collect data. The method was chosen as it provides the opportunity for both parties to discuss the topics in more detail. Face-to-face interviews also provide the opportunity to clarify unclear issues and ask follow-up questions. Themes were predetermined to ensure that all important issues would be covered in the interviews. The interview structure of the predetermined themes can be seen in Appendix 1.

Observations can be used as a part of the qualitative data collection. Observation is a method in which data is generated through personal experience and observations. To gain personal experience the researcher will settle in the research environment where all the aspects of the environment can be experienced first hand. (Mason 2002, 84.) Observations can be primary observations where a log is kept of what has happened and what has been said. In secondary observations observers make statements of what happened or was said. The secondary observations need to be interpretated by the researcher. The observations should also include the researcher's perceptions and feelings of the researched experience. To ensure reliability the observer needs to be biased (Saunders et al. 2003, 227-230.) The risk is that the researcher may focus attention on a particular event or feature that appears important or relevant and miss issues which are equally or more important but their importance is not acknowledged at the time (Hancock 1998, 13).

Observations were included into the qualitative research of this thesis. The observations were made during the time of employment (10 June 2008- 31 July 2008) in the case

company. The observations are based on observing operations, behavior and conversations in their natural environment in the case company.

Sampling techniques enable the researcher to identify, choose and gain access to relevant data sources (Mason 2002, 120). Sampling techniques also enable the researcher to reduce the amount of data collected by only regarding data from a subgroup rather than all possible cases (Saunders et al. 2003, 150). The sampling method used in this thesis is purposive sampling which enables researcher to choose the people whose opinion matters. Purposive sampling provides the possibility to select cases that will best enable to answer the research questions and meet the objectives. The purposive sampling guarantees that in this thesis the interviewed are relevant to the study. (Saunders et al. 2003, 175.)

7.2 Reliability and validity

The concepts of reliability and validity are commonly used to evaluate quantitative research. However there are different views whether reliability and validity should be used to evaluate qualitative research, and the concept's dependability and credibility are often applied in qualitative research. In qualitative research the terms validity and reliability are not viewed separately and thus terminology that encompasses both, such as credibility, transferability and trustworthiness is used. (Golafshani 2003.) However according to Patton (2002) any qualitative researcher should take into consideration validity and reliability while designing a study, analysing results and judging the quality.

Although the term reliability is often used for evaluating quantitative research: the idea is most often used in all kinds of research (Golafshani 2003). Reliability of the research refers to the consistency of the research results over time. The repeatability of the research process by other researchers achieving similar findings increases the reliability of the research. (Saunders, Lewis & Thornhill 2003, 101.) A high degree of consistency indicates a high degree of reliability meaning the research results are repeatable

(Golafshani 2003). In quantitative research the validity depends on the instrument construction while in qualitative research the researcher is the instrument (Patton, 2002).

Validity refers to whether the research findings are really about what they appear to be (Saunders et al. 2003, 101). Validity of a research determines whether the research measures what it was intended to or how truthful the research results are (Joppe 2000). The external validity of the research refers the extent the research results of the research can be generalised, meaning are the findings equally applicable to other research settings, such as other organisation (Saunders et al. 2003, 102). A research to be valid the concepts can be identified, observed or measures in the way the researcher states (Mason 2002, 39).

The reliability of this thesis was ensured by using the same predetermined interview structure for every interview. The consistency of the research method influences the type of data obtained and the way the data can be interpreted. By using two different data sources - interviews and observations - the reliability of interpretation was increased.

To ensure the validity of the thesis the themes were prepared with care, so that they would reflect the theory and the research objectives. The use of purposive sampling ensured that the respondents would be experts and have knowledge in the research issues. The employees chosen to be interviewed for the research all had years of experience in the case company and knowledge of the issues that were set to be researched. As the researcher is the research instrument in qualitative research the validity is increased by controlling and avoiding own bias.

The findings are transferable to other similar conditions. Similar companies with a similar structure could gain general information from the findings. The findings provide the case company information that they can use for improving their internal operations.

8 RESEARCH FINDINGS

The results of the research were obtained with interviews that were based on the predetermined interview structure (Appendix 1) and observations. Three persons were chosen to be interviewed. The original plan was to interview the purchasing manager, a sales person and an administrative person. Changes occurred as the purchasing manager resigned from his job and thus was not available to be interviewed. Instead a sales person who is experienced in purchasing and two persons from administration were interviewed. The interviews provided comprehensive information except for the measures part as the case company did not apply any kind of measures to their operations. However the information obtained from the three interviews and from observations was sufficient enough to provide a basis for analysis. The interviews were conducted on 30 July 2008 in the case company.

8.1 Interview with an employee of administration

The first person interviewed was an employee of the administration. She has been working over 10 years in the administration of the case company and she has an extensive knowledge of the internal actions of the case company. (Westerholm 30 July 2008, Pori.)

The interview began by clarifying the functions of the case company. The interviewee stated that the case company has a separate sales and purchasing functions, administration, warehouse and repair functions. The interviewee pointed out that there was a good interaction between the different functions. The interaction between functions is IT based where IT program is used to assist the operations. However not all functional interactions are based on the use of IT program also face-to-face communication is practiced between functions to transfer information.

The IT system is used for sharing company wide information such as order information. Sales people gather a collection list based on orders into the IT system. The list consists

of items that need to be purchased. The list is printed out from the IT system to the warehouse. The list provides information for the warehouse about the state of the order, when it is needed and if it is urgent. In the warehouse employees gather the available items on the list and forward onwards the order for transportation. The case company has an in-house transportation which allows them to transport items once a week to the Satakunta region and on a daily basis in Pori.

In the case company there is no joint decision-making or planning together with internal functions. The interviewee stated that all sales people make their own plans independently from each others on what to buy and when. The interviewee also pointed out that there were no budgets planned or followed for purchasing. The purchasing only makes plans on items that have a fast turnaround meaning the items need to be ordered on a weekly basis. The purchaser is also responsible for checking the alarm limits for fast turnaround items as too low limits mean it is time to refill the stock.

However the interviewee beliefs a mutual communication between the functions exists. Sales employees are responsible for sharing order information to other employees through the IT program. This enables other functions to see the existence of the order. The order can be then acknowledged by the warehouse and the administration which enables them to complete their responsibilities. The information sharing is mainly face-to-face communication and the use of the company wide IT program.

Co-operation between the functions is needed as every function is involved in the order to customer process. The interviewee provided her point of view to the coordination of order to customer cycle; the sales person makes a purchase from the supplier which then is transported either to the case company's warehouse or straight to the customer (co-operation with supplier, sales employee, transportation and warehouse). The sales person needs to give permission to the bill before the administration can send an invoice to the customer (co-operation with sales and administration). All necessary information about the order needs to be written into the computer system in order for participants to gain sufficient knowledge of the process. In the case company all work is done on a functional basis with the use of IT program. The work is done independently between the functions and no team work is applied to the operations.

In the sense of trade-offs between functions the case company has to balance its inventories and customer service levels. Big inventories are needed as it is necessary for the case company to have certain items available for the customers. However there is a need for minimising the stock as it will cost money to keep such a big stock. The interviewee suggested that there could be a maximum value for the inventory.

The case company has a computer system called Liinos 7 or L7 which is a fairly new system as they changed it during the year. The L7 program was implemented to the case company on 7th of December 2007. Every employee has access to the system and information concerning purchases, sales and warehouse. The administration has also additional information that can only be accessed by the administration. However the interviewee pointed out that the system could be more efficient. Sometimes double work and inconvenience is created due to problems in the IT system. The case company also has an internal intranet for its employees. The intranet is seen very useful as it provides fast way to give real time information within the case company.

Purchasing is very important for the case company as it is a trade company. As one of the main operations is to provide repair and maintenance services, the purchasing also plays an important role as supply of spare parts is necessary for this operation.

The structure of the purchasing is decentralised as every function makes own purchasing decisions and functions place purchases independently from others. Typically the persons who have expert knowledge about the purchased items are responsible of the purchases. In the repair service the case company has a single purchaser for items. The case company also has single buyers for VEM motors, Kärcher machines and for solar panels. The sales employees are able to place a purchase as they receive orders. The administration is responsible for purchasing services such as, in house cleaning and garbage disposal. The case company also has contracts with transportation companies which apply for one year time period.

The case company's purchasing strategy is to keep stock rates from growing too big. The case company has no beforehand set objectives or "how to" instruction for

purchasing. The interviewee recognised one guideline to be followed; fast items need to have a re-order-point set for once a week. The case company also has contracts with companies from which they purchase a large amount of items. These contracts typically state the payment terms for the participants.

Some type of co-operation is maintained with the suppliers. Means of contacting the suppliers are through phone, email and fax. The case company also uses an internet based online shop called Endorsia in which only few sales employees are able to access from the case company. Items that need to be purchased (mainly laurel) are gathered on a list and once a week the purchase is made through the use of Endorsia.

The case company also practices vendor managed inventory with its customers, meaning the customer companies have the case company's stock in their premises which the case company is responsible of refilling. The interviewee stated that further information about the VMI system could be obtained from the sales employee. According to the interviewee the case company does not have a system that enables the sharing of company information such as inventory, sales and order information to its suppliers.

The case company does not apply any kind of measuring system to its operations. However the interviewee pointed out that a monthly sales report is printed out where information about the sales by person can be seen. However the interviewee did not know if this information was used in anyway. The interviewee suggested in order for improve the work atmosphere the well-being of employees should be measured for example through sick leave rates.

Although there are no existing measures the employees of the case company provide continuously feedback to each other according to the interviewee. Employees and top management also give feedback to each other typically in informal settings.

8.2 Interview with a sales employee

The second person to be interviewed has been working in the sales of the case company over 17 years. He is familiar with both sales and purchasing operations. (Gustafsson 30 July 2008, Pori.)

The existence of functional co-operation between the functions within the case company is acknowledged. Even though the sales employees can make their own purchases from time to time they co-operate with the purchaser on purchases. Sales employees are responsible for communicating sales orders to the purchaser in case they are not able to purchase the items by themselves. When the items are received the warehouse employees will continuo to handle the order. The warehouse employees handle the received goods such as unpack them and put on stock or forward onwards to the customers. This can be only done if the received item has a code; if the item has no code it is more difficult to trace the order and this requires co-operation with warehouse and purchasing in solving the order.

The co-operation between different functions is working well according to the interviewee. The communication is working well between sales, purchasing and warehouse. Information is shared about orders and stock availabilities. The sales employees and the purchaser communicate with each other and with the warehouse face-to-face and with the use of the IT program.

The coordination of order to customer cycle from the point of view of sales; the order is made to the supplier, after the order is placed a gathered list goes to the warehouse which consists of the ordered items. When the items are received by the warehouse, the company transports them to the customer or informs the customer to pick them up or in some cases the sales person can deliver them to the customer. The people involved in the order to customer cycle include the sales employees, warehouse employees and the driver hence transportation. However co-operation between sales and administration is limited. The working atmosphere is individual and no team based working is applied in the case company.

Recognized trade-off areas in the case company are inventory and customer service as more items are purchased to stock in order to fulfil customer needs. However some very expensive items should not and are not to be kept on the stock.

The interviewee believes that the current L7 program is efficient for sales employees to use. However the interviewee suggested that intensive training of the program could provide more benefits to the case company as employees could gain more comprehensive skills to use the program. The intranet of the case company is also seen as very efficient and useful way to communicate within the house.

Purchasing is an important part of the case company and it is very vital for the operation of the business. The organisation of the purchasing has recently changed as before there was a single buyer for warehouse items such as the fast turnaround items and items needed daily basis. Currently the case company does not employ a purchasing manager that typically is responsible for the warehouse items. However the interviewee pointed out that in the future there probably will be a new purchasing manager. Currently all sales employees are responsible for purchasing items that mainly go straight to sales or purchasing items when a sale is made.

The purchasing strategy of the case company is to purchase items on a lower price than selling and maintaining minimum stock levels. The interviewee identified few "how to" instructions concerning issues such as delivery, consolidation, product quality and lead-times. A weekly delivery distance is kept for specific items which will able to consolidate the order and keep the transportation cost lower. The customers command the quality of the products; some customers want good quality and some customers prefer lower prices over quality. The lead-times are also demanded by the customers. However a guideline is that very expensive products that are ordered by a customer tie the customer to buy the items from the stock. There is also no beforehand decided purchasing budget for items as primary target of the case company is to fulfil the customer orders.

Co-operation exists between the case company and suppliers. Phone and email are the primary ways to contact suppliers. The Endorsia program is also used in which the case

company places orders via an online shop on a weekly basis. The case company also has established co-operation with some of its customers with the use of vendor managed inventory (VMI). The case company has 5 big scale VMI with customers and also some small scale VMI. With the different types of vendor managed inventories they have slightly different protocols. Some customers prefer to call to the case company and inform them to send needed items. The case company has a sales employee that is responsible for checking if the customers need a refill. The checking for re-fills takes place through a computer based program that shows real time information about the required items. The case company is responsible for the delivery of items for the customer although there is a one exception where the customer picks them up during its rounds. The interviewee considers the VMI system to be useful for the customers.

The case company does not have an IT program where their supplier could see the case company's stock rates or needs. However once a month a person will clean the shelf of Atlas copco tools and she has a list of items and amounts that need to be on the shelf, she then informs the employees if items need to be ordered.

There is currently no measuring system in the case company. According to the interviewee in the past monthly sales reports were produced and meetings were held to discuss issues but this is not done anymore. The interviewee suggested a measuring system that would involve all the functions and everyone to the measuring. The measuring could then take place quarterly and the measuring could be done against some beforehand set targets.

Feedback is provided in the case company, however the interviewee stated that positive feedback is given but the negative feedback is usually not given. According to the interviewee it would be good to have a conversation about the past week in the end of the week where everybody would be present and feedback could be given to each others.

8.3 Interview with financial manager

The third person interviewed was the financial manager of the case company. She has been working as the financial manager for 3 years in the case company and she has knowledge about the financial aspects of the actual operations. (Lähteenmäki 30 July 2008, Pori.)

According to the interviewee the interaction between operations is not good and lacks co-operation between purchasing, sales and logistics operations. There is no joint decision-making or planning between the functions. The sales employee thinks about his or hers own sales but there is no joint planning between sales employees. The purchaser is responsible for the re-order point of certain items but this is not done in co-operation with the warehouse.

There is a lack of communication between the functions. The interviewee believes that the communication gaps could be closed if information would be placed on the IT system. For example the sales people do not always put received orders to the system which creates confusion for the warehouse and for the administrations. These communication gaps show in the administration and cause delays in invoice recordings and thus delay payments. The situation could be fixed by entering all the necessary information to the IT system so that all the participants would be able to see the information.

The coordination of work from order to customer from the financial management point of view: the sales person initiates the order which when received is handled by the warehouse and forwarded onwards. The administration is involved in the process through invoicing the customer. According to the interviewee no team work exists between the functions in the case company in the order to customer process.

The trade of between inventory and customer service is recognized. It is difficult to keep low inventory levels as there needs to be items available for the customers. The problem also is that some products do not have a code and thus they can not be seen in the system and in the inventory. This creates even more confusion as the products

without a code do not really have a storage space in the IT system and the sales employees can not see the availability of these products in the program.

Visma L7 IT system is used in the case company. The program has limitations for different people for example the sales employees have different design in the program than administration.

The interviewee pointed out that the IT program would be very efficient if all the employees would use it correctly. If every sale would be entered to the system it would provide information about the sales orders and make it possible to consolidate orders and thus lower costs. If the item has been sold and there is no information about it in the system and the sales employee is the only one with the knowledge the warehouse is left without information. It is necessary for the warehouse to know whether the products were sold straight to the customer or if the products were sent to the stock of the case company. Entering necessary information into the IT system would make operations more easy and efficient and would not waste the time of employees.

The purchasing is a very important for the case company. The purchasing is organized in the way that different functions buy required items and administration purchases services. According to the interviewee there is no beforehand set budgets for purchasing or limits for stock. The interviewee pointed out that if the IT system would be used as accordance there would be more control over purchases. The information system also provides the possibility to make orders from the supplier and at the moment the case company is working on to make it possible with certain product groups.

As stated in the previous interviews the case company has no measuring system currently in their operations. The interviewee did not see that a measuring system would be necessary as the case company is a fairly small company. However the top management could set some goals and targets to be fulfilled. The goals then at certain periods of time should be checked if they would meet the required targets and if not then find the reasons behind it.

According to the interviewee no feedback is given among employees or top management to employees or vice versa. She stated that there is a need for meetings and conversations in the case company.

8.4 Observations

The observations are based on the researcher's personal experiences during a work period (10 June 2008- 31 July 2008) in the case company. The observations consist of observations of actual operations, behaviour and conversations in the natural environment of the case company.

In the case company work is done on functional basis. The case company consists of administration, separate purchasing and sales functions that seem to integrate work at times, combined warehousing and materials handling function and transportation and a repair service function. The warehouse co-operates with the purchasing as they are situated closely in the case company. However there seems to be a lack of communication from time to time between these functions which causes problems in the operations. (Observation 11 June 2008.)

Purchasing and sales inform warehouse about incoming orders and communicate with the warehouse about the received items. As the premises of the case company are not substantially big the communication between the functions is mainly face-to-face and the use of Intranet. (Observation 16 June 2008 & 2 July 2008.)

In the case company there is a computer program called L7 that enables the sharing of information with all the users. If information is entered to it correctly it enables the tracking of orders, inventory levels and product information among other issues. However the problem is that there seems to be minimal training for the program and employees do not get the full advantage of using the program. (Observation 16 June 2008.)

The employees had a conversation about the new IT system and its functionality. A lot of frustration was experienced towards the IT system among the employees. The new system was experienced slow and difficult to use. (Observation 11 June 2008.) Some employees encountered problems entering information to the IT system; these problems then were transferred to administration, IT or purchasing. However the administration, purchasing and IT co-operated with other functions to fix the problems. (Observation 13 June 2008 & 16 July 2008.)

The administration co-operated with the sales employees, purchasing and the warehouse in order to solve problems in orders (due to lack of information in the IT system). An administrative employee individually went through the orders with the purchasing manager and the warehouse and then with the sales employee in order to solve the problem in the orders. (Observation 12 June 2008, 18 June 2008 & 10 July 2008.) As necessary order information can not be found from the IT system the administration is required to check the information gaps from the sales employees causing double-work (Observation 11 June 2008, 17 June 2008 & 7 July 2008).

One of the sales employees did not have time to create order information into the IT system and thus this responsibility was transferred to the administration. This decision made a simple task more complicated as the administration needs to first communicate with the sales employee about the order and then enter the same information to the system. (Observation 12 June 2008.)

During the time of employment (10 June 2008- 31 July 2008) no meetings were held concerning weekly operations or future operations at the knowledge of the researcher. It was noticed that feedback was rarely given to the employees or among the employees.

9 CONCLUSION

The need for this thesis originated from the fact that the case company wanted to improve its internal operations. In order to improve the operations of the case company, information needed to be obtained about functional relationships, how to improve the co-operation in the internal supply chain and ways to measure it. Information about the ways to improve the internal supply chain emphasised on the use of information technology. The theoretical part also included information about purchasing as it is a very important operation for a company operating in the trade business.

The empirical part consisted of information gathered from the case company employee interviews and observations. A predetermined interview structure was made to ensure the reliability of the research by using the same interview structure for each interview. The main points of the theory were used as a basis for the interview structure. Three employees were chosen to be interviewed, a sales employee, an administrative employee and a financial manager. Originally a purchasing manager was chosen to be interviewed but due to certain circumstance he was not able to be interviewed. However sufficient information was obtained about the purchasing function without the interview of the purchasing manager.

The observations were made in the case company environment during the time of employment in the case company. It was necessary to control and avoid own bias during the observations. However personal feelings of the situations were included into the observations as in qualitative research it can be hard to separate feelings from information.

Useful information was obtained about the internal relationships of functions, information technology and purchasing. Information about measures was not sufficient as the case company did not apply any measuring system to its operations. However the interviewees provided suggestions concerning measures. The information derived from both the interviews and from observations provided enough information for the analysis.

Contradictions could be seen in the research results as different point of views were provided to the concerning issues. Contradictions could mainly be seen in the perception of the quality of functional relationships in the internal supply chain and on issues concerning feedback. The case company recognised the structure of the case company as functional. As Ayers mentions the negative aspect of functional structure (Ayers, p.7) the case company was experiencing lack of communication and co-operation in the internal supply chain. The case company did not also have a joint decision-making or planning between the internal functions. However the close co-operation between purchasing, sales and logistical functions was recognised.

The need for coordination and information sharing in the order to customer cycle was understood. The case company has tried to integrate the internal operations with the help of IT system. As Rutner, Gibson, Vitasek and Gustin mentions the importance of integrated information systems in the integrations of functions (Rutner et al., p.19) the case company has applied a new integrated IT system to its operations that enables the information sharing throughout the internal supple chain. However the case company has not provided efficient training for the new program causing the inefficient use of the IT program and information gaps between functions. The case company also applies an Intranet to its operations that has been proven to be very efficient way to communicate and share in-house information.

The case company recognises purchasing as a very important operation for a trade company. The need for co-operation and information sharing between purchasing, warehousing and transportation is acknowledged. However the quality of the co-operation and communication could be more comprehensive. As Bloomberg points out the importance of integrated purchasing and logistics (Bloomberg, p.29) the case company has not tried to integrate purchasing and logistics functions together to ensure closer co-operation. The logistics function is also seen as a separate warehousing and transportation functions. However the case company has tried to enhance the co-operation and communication with the use of the IT program.

The purchasing strategy of maintaining minimum stock levels and buying with lower prices was acknowledged in the case company. However no common set of objectives were set to execute the purchasing strategy. Although few guidelines concerning high priced items and fast turn around items among other issues were recognised as purchasing guides. The case company also recognised the trade-off areas of customer service and inventories. The case company's target is to please customers thus items need to be available in the stock causing higher inventory levels and tied-up money.

The case company's purchasing is organised in a decentralised way where functions are in charge of their purchases. Decentralised organisation benefits the case company as specialists are in charge of the purchased items. The case company does not have a close partnership with its suppliers or customers were information would be shared between the case company and suppliers or customers. However as Christopher mentions the benefits of vendor managed inventory (Christopher, p. 31) the case company currently practices vendor managed inventory with some of its suppliers however different protocols are applied to different suppliers.

The absence of a measuring system was well recognised by the case company. As the case company does not have a measuring system it is not able to receive continuous feedback on its performance. Although it was stated that positive feedback was shared among the company, the absence of feedback was also acknowledged.

10 RECOMMENDATIONS

The primary process for a trade company is to take care of the flow of the items from suppliers to the customer. As the case company is a trade company it should be able to manage the internal supply chain efficiently. There are some issues that the case company should do in order for them to improve their internal operations. In the following is described some recommendations for the case company based on the research results.

As the case company manages operations on a functional basis it experiences typical problems of functional structure such as lack of communication and co-operation. Although the case company has tried to integrate the functions with the use of company wide IT system they still experience lack of co-operation. As Monczka mentions information technology and team work are ways to execute integration (Monczka, p. 13) the case company can take further the internal integration. The case company can support the integration by creating cross functional teams where people from different functions work jointly drafting plans for future operations.

The case company's IT system is an important part of the internal integration process. As Stank points out the importance of proper training of information technology (Stank, p. 20) the case company is recommended to provide necessary training of the IT program to the employees. Some type of resistance was also experienced when the new IT program was implemented into the operations, for the case company it is important to communicate clearly their purpose and goals in order to overcome resistance. The efficient use of the IT program will benefit the case company by closing information gaps between functions and creating visibility across the internal supply chain.

The logistics operations of the case company are seen as separate functions and as Waters mentions the problems of fragmented logistic (Waters, p. 8) the case company has experienced double work and wasted resources due to lack of integration. It is recommended that the warehousing, materials handling and transportation would form single logistics functions in order to efficient the internal operations and deepen the existing co-operation. To ensure efficient flow of information and items throughout the internal supply chain the purchasing should be coordinated with the integrated logistics. The case company can either implement purchasing as a part of integrated logistics or purchasing can control and manage the integrated logistics.

The trade-off areas in the case company are customer service and inventory. Big inventories cost money and are seen as a problem, however good customer service is essential for the case company and thus items need to be available in the stock. To maintain a balance between inventory and customer service it can be recommended that

some type of control would be applied for the inventory to control the stock levels. Items without a code are also seen as a problem, it is recommended that the purchasing and logistics would co-operate on solving this problem. The IT program could also be used to manage the items without a code.

The organisation of the case company's purchasing is decentralised whereas the purchasing manager is responsible for the purchases of warehouse items and different functions of their required items. In the functions purchases are made by employees who are specialist on the buying of certain product groups which enables higher purchasing competence. However decentralised organisation of purchasing enables the case company to respond faster to customer requirements and it is beneficial for the case company as they drive to maintain customers satisfied. However it is recommended that meetings are arranged where everyone involved in the purchasing would have to participate. In these meetings strategic level purchasing such as long-range planning and tactical level purchasing such as supplier negotiations and operational level tasks such consolidation would be taken into consideration. Functional strategies that support each other should be created in order to avoid different priorities in the functions.

The case company's purchasing strategy is to keep stock levels low however the purchases are made by many different employees and thus it can be hard to execute the purchasing strategy as the case company does not apply any objectives or policies and procedures to its operations. As Baily mentions different purchasing objectives from acquiring items to maintaining supplier relationships (Baily, p. 25) the case company should form their own objectives that will reflect the company's overall strategy and to further guide purchasing and the development of policies and procedures is recommended. By creating a set of guidelines and using the IT system the case company can try to have more control over its stock levels.

Co-operation with the suppliers and the case company is minimal. However vendor managed inventory is practiced with some of the suppliers. This enables the case company to see real time demand and enables them to plan more accurately the materials handling and transportation of items. As Bowersox mentions the benefits of co-operation between purchasing and suppliers (Bowersox, p.30) the case company is

recommended to extend integration to their suppliers. However this requires the case company to share openly sales and ordering information and to acquire necessary information technology. Currently the case company is trying to make it possible to place orders from some of the suppliers with the use of the IT program, concerning few product groups.

Metrics guide a company's operations and provide information about what is good and where improvements are needed. The case company does not have any metrics applied into their operations. In order for the case company to integrate their operations and ensure that everything is working efficiently the case company should consider applying metrics. Goals and targets need to be set for measuring. Benchmarking can be used to obtain information about best practices and thus in the creation of targets. The measures should involve everyone from the case company and they should be communicated in the way that everyone understands the purpose of the measures.

The need for feedback is recognised and thus it is recommended that the case company would provide the possibility for its employees to give feedback. Meetings and conversations should be arranged where it would be possible to give regular feedback for both employees and top management. To ensure the efficiency of internal operations and the well being of employees it is necessary to measure internal operations and to provide the opportunity to give feedback.

As Stank mentions the need for increased communication and coordination in change (Stank, p. 14) the case company should get the employees involved in the integration process. It is necessary that the purpose and goals of changes are clearly communicated. To achieve higher performance incentives should be implemented to support the process.

The results provide useful information for similar trade companies as the case company. The findings provide general information about the purchasing function, functional relationships and the ways to improve the functional relationships. For the case company the results provide information about their internal supply chain and the quality of co-operation and communication between functions. The results provide

recommendation on how the internal supply chain can be further improved. The results also provide information about the internal purchasing and what issues affect to it. The case company can use the information to improve its internal supply chain.

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Relationship of functions within the company

Interaction between purchasing, sales and logistics operations (inventory, warehousing, materials handling & transportation)

- -decision-making, planning, budgets

- -communication

- -coordination of work (individual /co-operation) (from order to customer who is actually involved and how)

- -team-work/ co-operation

- Trade-off between operations

    - inventory/customer service
    - problems

-Technology

   -integrated systems, intranet
   -access to the systems, efficiency

Purchasing

- Importance

- Organization of purchasing

    -single buyer/ functional or integrated purchasing

    -structure; decentralized/centralized

- Objectives & guidelines, frameworks

  - "how to" instructions considering purchasing (terms of payment & transportation, budgets, product quality, lead times, consolidation)

- Co-operation with suppliers

  - type of contact (phone, e-mail, information system)

  - information systems

  - information sharing

Measures

- Current measures

    -what is measured

    -based on single function, individuals

    -number of measures

    - useful, efficient

-Types of measures

    -financial/non-financial

-Rewarding

-other incentives

-understanding measures

Efficient measures

What to measure

 -Beforehand defined goals/rewards

-based on performance of a individual or process

-feedback

-type of measures -nonfinancial/ financial measures