VAASAN AMMATTIKORKEAKOULU
VASA YRKESHÖGSKOLA
UNIVERSITY OF APPLIED SCIENCES

Johan Nyfors

PROFITABILITY IMPROVEMENT FROM EFFICIENT SUPPLY CHAIN MANAGEMENT IN A PROJECT-BASED COMPANY

Business Economics and Tourism

2014

VAASAN AMMATTIKORKEAKOULU
International Business

ABSTRAKT

Författare	Johan Nyfors
Lärdomsprovets titel	Lönsamhetsförbättring från en effektivt styrd leveranskedja i ett projektbaserat företag
År	2014
Språk	Engelska
Sidantal	72 + 1 Bilaga
Handeledare	Jukka Paldanius

Det primära syftet med den genomförda studien var att klargöra och identifiera vad som är leveranskedjans och logistkens målsättning och motsvarande värde i en projektorienterad organisation.

Det sekundära syftet med studien var att undersöka och ta reda på hur moderna logistikmodeller och -strategier kan genomföras inom projektbaserade organisationer för att leda till ett mervärde och lönsamhet. Baserat på ett teoretiskt ramverk och praktisk kunskap om ämnet, var följande steg att identifiera hur en kostnadsfokuserad och effektiv logistikprocess kan vara till nytta för case-företaget.

I den empiriska forskningen blev en fallstudie genomförd med syfte att nå en slutsats. Fallstudien byggde i första hand på intervjuer med anställda från logistikavdelningen i case-företaget. Intervjuerna genomfördes på ett kvalitativt sätt. Som sekundär datainsamlingsmetod, har material som är relaterat till och skapat av case-företaget använts och undersökts.

Utifrån den teoretiska ramen och empiriska studien, kan man dra slutsatsen att det fanns vissa utvecklingsområden som är giltiga för de flesta företag. För att förbättra prestationer - både processrelaterade prestationer och finansiella resultat - föreslår vi att företagen fastställer tydliga marknadsfokuserade strategier för sin leverantörskedja och logistikfunktion. Strategierna bör tydligt kommuniceras till alla inblandade parter och med strävan att få en förståelse. Dessa strategier bör innehålla tydliga målformuleringar och mått/nyckeltal för: kundfokus, konkurrentinsyn, samarbete med partners och kompetensutveckling.

Nyckelord: Leveranskedja, Logistik, Konkurrensfördel, Värde, Lönsamhet

VAASAN AMMATTIKORKEAKOULU
UNIVERSITY OF APPLIED SCIENCES
International Business

ABSTRACT

Author	Johan Nyfors
Title	Profitability Improvement from Efficient Supply Chain Management in a Project-Based Company
Year	2014
Language	English
Pages	72 + 1 Appendix
Name of Supervisor	Jukka Paldanius

The primary objective of the conducted study was to examine and identify what the aim and the corresponding value of supply chains and the logistics in project-oriented organization is.

The second objective of the study was to investigate and find out how modern logistics models and strategies can be implemented and used within project-based organizations, in order to result in added value and profitability. Based on a theoretical framework and practical knowledge about the topic, the following step was to identify how a cost-focused and efficient logistics process can be beneficial for the case company.

In the empirical research a case study was carried out in order to reach a conclusion. The case study was primarily based on interviews with employees from the logistics department of the case company. The interviews were conducted in a qualitative manner. As secondary data collection method, material related and created by the case company was utilized and investigated.

Based on the theoretical framework and the empirical study, it could be concluded that there were some areas of development that are valid for most companies. In order to improve the performance – both process and financial performance – it is proposed that companies establish clear market-focused strategies for their supply chain and logistics functions. The strategies should be clearly communicated to all parties involved and strive to obtain an understanding. These strategies should include clear purpose statements and measures/KPIs for customer focus, competitor insights, business partnerships as well as competence development.

Keywords: Supply chain, logistics, competitive advantage, value, profitability

ABBREVIATIONS

CROL	Customer Relations On-Line
EFQM	European Foundation for Quality Management
EPC	Engineering, Procurement, Construction
ERP	Enterprise Resource Planning
FOB	Free On Board
GW	Giga Watt
HFO	Heavy Fuel Oil
JOT	Just On Time,
KPI	Key Performance Indicator
LNG	Liquid Natural Gas
PDCA	Plan – Do – Check – Act
OECD	Organization for Economic Co-operation and Development
RADAR	Results – Approach – Deployment – Assessment - Review
ROI	Return On Investment
SC	Supply Chain
SCM	Supply Chain Management
SPG	Smart Power Generation
SRAM	Situation – Root – Act - Monitor
WSM	Wärtsilä Supply Management

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1 INTRODUCTION

1.1 Background

Supply Chain Management (SCM) and logistics are terms which were introduced to the business world during the 1950's and 1960's. The highly competitive market that most companies' faces today, has led to that far-going strategies and processes in all sections of the Supply Chain (SC) are needed in order to be cost effective and as efficient as possible. The importance of a well-working, cost effective and efficient supply chain is a factor that can make or break the profitability of a company. In order to be successful with the supply chain, it is crucial that the internal supply chain inside a company is well-working; equally important is the management of the external parties of the supply chain. By successful management of the external parties of the supply chain, achieving the company's desired goals and objectives is made possible.

1.2 Objective and Research Problem

The objective of this thesis and the main research problem is to examine and identify what supply chain and the logistics is, and more importantly – how modern logistics models and strategies can be utilized in order to bring added value and profitability to a project oriented company. Based on a theoretical framework and practical knowledge about the topic the following step will be to identify how cost effective and efficient logistics can be beneficial for the case company. The final question, to which this research tries to find an answer, is:

What still needs to be done, and how could logistic strategies be implemented and further improved to achieve notable results in a project-based organization?

In order to properly answer the question above, the aim is to propose necessary tools and methods to the case company in order to reach and maintain excellence as well as continuous improvement within the organization. In the thesis certain elements from some specific efficiency improvement methods based on the

SRAM decision-making model, the EFQM method for Self Assessment and the Kaizen approach will be introduced and applied.

The entire supply chain will be investigated and analyzed in the theoretical framework of thesis but the main focus will be on logistics and related activities.

1.3 Limitations of the Thesis

Due to the complexity of the subject concerning supply chain management, it is required that the thesis work is more specifically focused. For this reason the main focus will be set on the outbound logistics processes and the related activities of the supply chain. Based on the facts the following limitations are implemented to the thesis:

- SCM in public organizations and entities is not discussed.
- Inbound logistics theories and related practical approaches are excluded.
- The numbers of methods and models, used for performance and efficiency. improvement are focused on some specific methods and tools only.
- Only one business line / division of the case company will be investigated and analyzed.

1.4 The Structure of the Thesis

This thesis is divided into seven particular chapters with related sub chapters.

Chapter 1 introduces the background of the thesis as well as the purpose and the research problem and related limitations.

In chapter 2, we introduce the theoretical framework and definitions related to supply chain management. The literature´s views on SCM strategies, objectives and related measurement are presented.

The third chapter will introduce the logistics concept and related definitions. Competitive advantage and cost advantage that can be derived from efficient logistics processes are discussed. The strategic logistics approach is shortly described.

The main focus of chapter 4 is on how logistics is adding value to the organization products and services as moving through the supply chain towards the customers. The purpose of this chapter is to achieve a better understanding of strategic issues related to organizations as well as identifying which activities are value-adding and factors that points the logistics resources towards the corporate goals. The three generic strategies are among those which are scrutinized in this chapter. The theoretical aspects of the value chain and competitive advantage concepts in relation to supply chain management and logistics will – in a condensed way – be discussed in this chapter.

There are numerous philosophies, models, methods and tools that have been developed in order to improve decision-making, performance and efficiency in organizations. Since we – in this thesis – are concentrating on performance and efficiency improvement of the supply chain and, more specifically, of the outbound logistics, we have decided to select the following methods and/or tools: the SRAM decision-making model, the EFQM method for Self Assessment and the Kaizen approach. In chapter 5, these methods will be briefly discussed and analyzed. How they can be used for performance improvement in a Supply Chain/Logistics function is looked into.

Chapter 6 will be focused on the empirical research, which has been conducted in order to discover essential information concerning profitability by efficient SCM in a project-oriented company. The chapter will start off with a presentation of main research methods. When the most suitable research method has been selected for this particular research, the chapter will go further into the planning and execution concerning the collection of the data and analysis as well as the validity and reliability of the research. A presentation of the case company, Wärtsilä Power Plants, is made including the case company's supply chain management and logistics activities as well as structure. The chapter will present the research results of the interviews.

In the final chapter (7), the results of the theoretical and empirical study will be summarized and concluded. A brief comparison with the theoretical framework is

made be made. Our suggestions for improvement of profitability and performance of the supply chain and logistics management will be presented. Finally, the thesis is ended with some proposals for further research.

2 SUPPLY CHAIN MANAGEMENT

2.1 Supply Chain Definitions

The supply chain consists of a collection of functional activities such as transportation and inventory control. The activities are repeated throughout the logistic channel trough which raw materials are converted into a finished product and consumer value is added. Supply chain activities do not stop when the product has reached the end customer, recycling is also an activity related to the logistic chain (Ballou, 2004, 7).

The global definition, according to Govil and Porth, is by referring SC to a global network of organizations, which work together to improve the flow of information and material between suppliers and customers in the fastest and most cost-effective way possible. The core focus of the supply chain is to create customer satisfaction (Govil, Porth 2002, 7).

Within SCM, planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities is included. Also, coordination and collaboration with channel partners, which can be suppliers, intermediaries, third party service providers, and customers is contained in the supply chain. Basically, SCM integrates supply and demand management within and across organizations. Supply chain management is an integrating function with the primary responsibility for linking major business functions and business processes within and across companies into a coherent and high-performing business models. It includes logistics management activities noted above, manufacturing operations and it supports coordination of processes and activities across and with information technology marketing, sales, product design and finance. (Supply Chain Management, SCM, as Defined by the Council of Supply Chain Management Professionals, CSCMP, 2004).

Supply chain management builds on the framework and seeks to achieve coordination and link-up between the activities and processes of internal as well as other entities such as suppliers' trough out the chain. One of the main focuses of SCM is on cooperation, building trust and recognizing that if well-managed, the outcome can be significant. One way of defining SCM is by referring to it as; the management of upstream and downstream relationships with suppliers and customers in order to deliver superior customer value at less cost to the supply chain as a whole (Christopher, 2011, 2).

2.2 Supply Chain Strategies

In order to be successful in SCM within an organization, a well-planned corporate strategy is needed. The corporate strategy needs to be clear for all parties and it needs to be based around the organization's future aims and goals. A useful corporate strategy needs to be created around several internal and external factors, such as customers, competitors, suppliers and the company itself. Making a SWOT-analysis of all the four mentioned factors may clarify which issues needs further focus and priority (Ballou, 2004, 34-35).

To create a well-functioning SC strategy, it needs to have the same basis and follow the same criteria as when making a corporate strategy. Competitive advantages can be obtained if the company utilizes innovative approaches when making the strategies. Designing efficient strategies does not require any particular programs or techniques, but there are various factors that should be taken into consideration before making the strategy (Ballou, 2004, 35). There has lately been an understanding among companies that defining their SC / logistics vision of their organization can be of high significance. The logistics vision statement should indicate the basis on which the business intends to create a position of advantage by closer customer relations. 'How do we intend to use logistics and supply chain management to create value for our customers?' is the focus of which the statement should be built around. In order to make this idea operational it will demand a detailed understanding of how customer value is - or possibly could be - created and delivered in the markets in which the business competes (Christopher

2011, 228). Three objectives which a SC strategy should be focused around, are capital-and cost reduction as well as a service improvement objective.

The cost *reduction objective* focuses on reducing variable costs related with movement of goods and storage. The best results reached by cost reduction can be achieved by evaluating various alternatives to make changes possible, such as changing storage locations and / or selecting more cost-effective transport modes. (Ballou, 2004, 34-35).

Capital reduction is more directed towards decreasing the level of investment in various logistic systems. The motivation for this strategy is the maximizing the return on logistic assets. Applying Just On Time (JOT) deliveries or direct deliveries and possibly increasing the use of third-party logistics when sending goods to customers is one possible approach for this model. Utilizing the following model will reduce the warehousing and storage expenses. One outcome of this model may be that variable costs increase, however, the return on investment (ROI) may be inflated (Ballou, 2004, 35).

Service improvement strategies do in most cases acknowledge that revenues depend on the level of logistic-related services which are being provided. Increased cost is a direct effect of increased logistics customer service, the enhanced revenues may offset the higher costs. Competition is a determining factor which is crucial to take into consideration in order to make an effective strategy (Ballou, 2004, 35-36).

2.3 Measurement of SCM Strategies

Once the SC strategies have been adopted and implemented into the company´s way of working, it is of high significance to evaluate the effects and results which the strategies have brought. There are three main kind of financial measures of which the evaluation can be based around. The measurements are cash flow, savings and return on investment. If the outcomes of the measurements are positive, one conclusion which can be drawn is that the strategies are working. Cash flow is based on the money which is generated trough the company's SC strategies. The

cash flow is highly dependent on what kind of strategy is used. Savings refers to the main changes in all primary cost associated with a strategy. The contribution of the savings can be seen in the profits of the business. A strategy which changes the number and location of the warehouses in a logistics network will have immediate effects on production and purchasing, transportation, warehousing and inventory costs. A well thought trough network design strategy will generate noticeable annual cost savings. This type of saving can be seen as a direct profit improvement on the profit and loss statement. ROI is the ratio of the annual savings from the strategy to the investment required by the strategy. ROI is an indicators of the efficiency with which the capital which is being utilized. The result of effective and well-working strategies is shown by a return that is equal to or greater than estimated return on a company's projects (Ballou, 2004, 55-58).

2.4 Key Performance Indicators and SCM

There is a saying that "what gets measured gets managed". It is important to understand what the crucial performance factors are in an organization and, therefore, what the organization should be measuring. Performance drives profitability; improved performance leads to higher profits (Martin & Peck, 2003, 123).

Key Performance Indicators (KPIs) are measuring what the organization is achieving in relation to its strategies and planned business objectives and in satisfying the needs and expectations of everyone with a financial interest or other stake in the organization (EFQM, 1999, 28).

In most cases, the KPIs can be divided into two main groups; 1) financial measurements and 2) performance measurements for efficiency and effectiveness. As described in chapter 2.3. Measurements of SCM Strategies, the KPIs for the supply chain and logistics processes normally consist of combinations of financial measures and efficiency performance measures focusing on Delivery Service Improvements, Capital Reduction and Supply Chain/Logistics Cost Reduction (Lumsden, 2012, 267).

Typical Delivery Service KPIs measure stock availability, delivery accuracy, on-time delivery, SCM-service level and delivery flexibility. Capital Reduction KPIs focus on inventory levels and capital turnover. Cost Reduction KPIs normally measure the development of stock handling costs, SCM administration and transportation costs. These costs are called "total costs of logistics (Oskarsson et al., 2006, 33-36). In the end, all these KPIs are giving an indication of SCM impact on the organizations profitability and effectiveness. Sometimes, these KPIs can create logistical conflicts, for instance when the organization is focusing on lower transportation costs. This cost reduction may increase the amount of material in stock and a decrease of the service level to customers due to optimized delivery quantities and delivery timing from a cost point-of-view. In these cases, a trade-off analysis is required, meaning that the company may decide to increase selectively transportation cost, if that action leads to higher profits (Lumsden, 2012, 268-271).

An important KPI for measuring Delivery Service is On-time delivery, which is – in most cases – is calculated as follows:

$$\text{On-time Delivery (\%)} = \frac{\text{Number of deliveries on time}}{\text{Total number of deliveries}} * 100$$

Formula 1. On-Time Delivery KPI (Oskarsson et al., 2006)

The key performance indicators for Delivery Accuracy and Order Completeness are calculated in the same way (Oskarsson et al., 2006, 195).

In the logistics literature, the measuring concepts of "the perfect order" and "landed costs" are mentioned. In short, the "perfect order" is a measure indicating how effectively logistics serves the customer; timely, complete and error-free deliveries. The "landed cost" measure indicates how efficiently logistics provides the deliveries including transportation, warehousing, handling, packing, broker fees and customs fees strategy (Bozarth and Handfield, 2004, 378-381).

Many organizations are using KPIs for measuring performance against ”best in class” – benchmarking. In other words, comparing the own company’s performance against those companies (or competitors) identified as the best in the same industry. Such companies are good benchmarks for improving the operations and related process performance (Martin & Peck 2003, 35 and 123).

3 THEORETICAL ASPECTS OF LOGISTICS

3.1 Introduction and Definitions of Logistics

There are several ways of defining the word “logistics” and its meaning. One way of defining logistics is by referring to it as a process consisting of activities and phases starting with a planning phase. After that the planning is completed comes the implementation stage. Throughout the entire process it is of high importance that controlling procedures is done in order to ensure efficient and effective transportation and storage of goods. Services are included as well as related information from the starting point to the point of consumption for the purpose of adapt to customer requirements. This definition does include terms such as inbound-and outbound logistics as well as internal-and external movements. (Vitasek, 2006, Supply Chain and Logistics Terms and Glossary)

Logistics has for the two past decades grown from having only been being related to transportation and warehousing, to now having become a crucial part of a company’s competitive strategy. The first starting point is the importance of logistics in the context of creating a competitive advantage and being profitable for a company. In order to grasp the full meaning of logistics, it is important to start with getting an understanding of what a customer wants and expects as well as how the customer needs are met in a cost effective manner. The second starting point is that logistics concerns to get the company’s flow of goods to operate in a cost effective and customer-oriented manner. This concept is strongly related to the reliability of the company regarding purchase order management, and meeting customers’ expectation when it comes to the product and the promised delivery time. Being flexible and ready for changes in context of logistics may be a key driver for success (Oskarsson et al. 2006, 11-13).

3.2 Logistics and Competitive Advantage

A competitive advantage can be defined as “the position of enduring superiority over competitors in terms of customer preference”. The competitive advantage may be reached through efficient and organized management of logistics and the

supply chain. There are numerous ways and various models which can be followed in order to achieve success on the market (Christopher 2011, 4). The means by which value is delivered to customers is a crucial subject regarding the sustaining and maintaining of competitive advantage (Christopher and Peck, 2003, 103).

The awareness of well-functioning logistics systems can present itself in the manner of providing the organization with a sustainable competitive advantage. Original sources of advantage concentrated around factor such as access to large captive markets or some unparalleled technological expertise, also factors such as natural resources and low labor costs. Finding a justifiable and sustainable competitive advantage is the aim of all profit-oriented organizations (Christopher 2011, 58).

3.3 Cost Advantage

Often when referring to low-cost products it means that sales volumes are in the higher end. In every industry at least one competitor with cost advantage can be found. Cost advantage can and will make it possible to spread fixed costs over a greater volume, but more particularly to the impact of the experience curve as Figure 1 shows. The so called experience curve is a remarkable development, which roots back to the earlier notion of the so called learning curve. The extended concept will show that not just production costs, but rather all costs, will decline at a given rate as volume increased. Basically the relationship that the experience curve describes is between real unit costs and cumulative volume (Christopher 2011, 5).

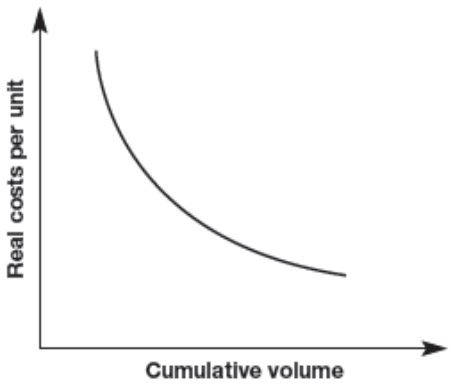

Figure 1. The Experience Curve (Christopher, 2011)

Cost reduction can be an achievement of greater sales volume, particularly by improving the amount of market share as presented in Figure 1. Nevertheless, the hunt for economy of scale through volume increase will not, in all cases, result directly in enhanced profitability. The direct reasons might not be found in the internal functions of an organization, rather in the cost of a product which can be related to external factors and parties of the business in the wider supply chain. By a further improved logistics chain and better supply chain management the result in that better productivity and efficiency can be achieved which in second hand will result in noticeably reduced unit costs (Christopher, 2011, 5).

A normal axiom within marketing is that customers do not purchase products, rather they purchase benefits. An alternative point of view is that the product is purchased not for itself but for the undertaking of what it will offer. These benefits may be intangible, such as a service or an image. Additionally, the delivered offering can be seen to outrank its competitors regarding the functional aspect. It is vital to seek additional value in order to stand out from the competition (Christopher 2011, 6).

In fact, the development strategies based on added value will normally demand more segmented approaches to the market. When an organization investigates and analyses the market thoroughly it frequently finds that there are distinct value segments. In other words, some customers in the market attach different importance to different benefits. The consequence of such benefit segmentation is that there are substantial possibilities of creating differentiated appeals for particular segments (Christopher, 2011, 6).

One way of receiving a defensible advantage on the market is by adding value to customers through differentiation and this approach has been shown to be a successful method. Service can be seen as equally strong as approach of adding value. Challenges for logistics management can be seen in the cases where markets are evolving to more service-sensitive markets. In this context service is related to developing customer relations by the provision of an increased offer. Delivery service, after-sales, technical support and financial packages are some of the pos-

sibilities which can be seen in the extended offering. Other trends which are starting to become obvious on the market is that that the interest in particular brands is decreasing and moving more towards a commodity market status as can be seen in Figure 2 (Christopher, 2011, 6-7).

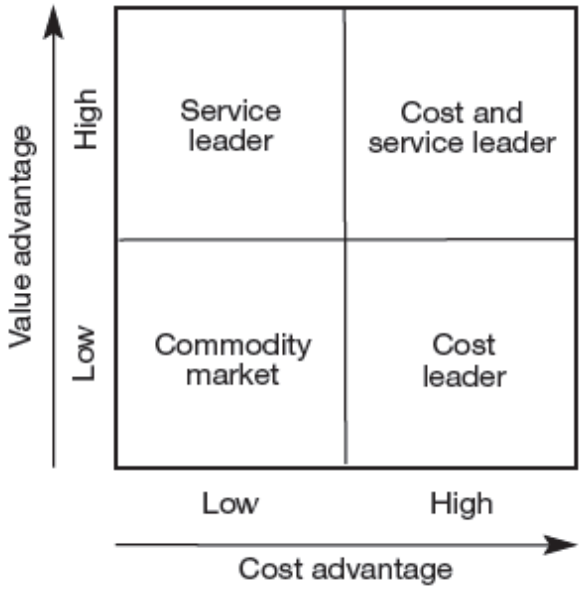

Figure 2. Logistics and Competitive Advantage (Christopher, 2011)

3.4 Logistics Strategies

Logistics is becoming an increasingly significant and exposed component of the organization's corporate strategies. In order to perceive the value of logistics as a source of competitive differentiation requires that increasingly complex strategies, longer lasting and more difficult to reverse are developed and implemented (Skjøtt-Larsen et al. 2007, 12).

The definite exposition of logistics strategies development problem is highly dependent on the attributes of the customers, products as well as the marketing channels used by the seller or organization. Due to this approach it is crucial to start with the disposition with a definition of the various kinds of logistics related situation that an organization may face (Gattorna, 1997, 126-128).

A logistics strategy is an extension of the supply chain and overall operation strategy. An organization's logistic strategy needs to ensure that the logistic choices are consistent with the overall corporate and business strategy. The choices consist of the following activities: transportation, warehousing, utilization of logistics information systems as well as forming of ownership. Supporting the performance dimensions which are of most value for the customers is a crucial factor which is to be taken into consideration when creating the strategy (Bozarth and Handfield, 2004, 362-363). The aim of any organization's strategy should be focused at adding value for customers since earlier experiences present that profit and growth will mostly come from satisfied customers. In order to ensure that the strategies are effective, it is crucial that that everybody is aware of them and able to relate and comprehend them as well (Gattorna, 1997, 77-78).

4 COMPETITIVE ADVANTAGE AND ADDED VALUE

4.1 Generic Competitive Strategies

There are two main types of competitive advantage – low cost and differentiation - combined along with the scope of activities that a may decide a company's relative position within an industry. The foundation for above-average performance in the long-run is sustainable competitive advantage. Although a company can have many strengths as well as weaknesses compared to its competitors, the significance of any strength or weakness which a company has is at the function of its impact on differentiation and relative cost. The two basic competitive advantages that companies strive to achieve lead to three generic strategies for achieving above-average performance in an industry: cost leadership, differentiation and focus. Each of the strategies consist of a basic route to competitive advantage, combining a choice about the type of competitive advantage sought with the scope of strategic target in which competitive advantage is to be achieved. The focus strategy aims at cost advantage (cost focus) or differentiation (differentiation focus) in a narrow segmentation while the differentiation and cost strategies looks for competitive advantages in a broad field of industry segments as shown in Figure 3 (Porter, 2004, 11).

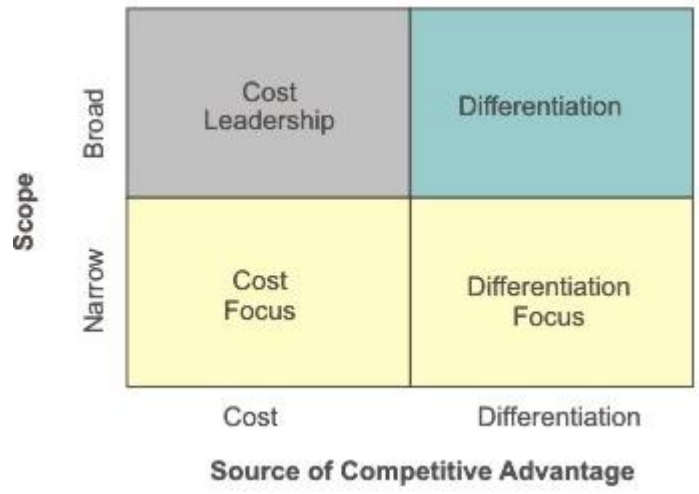

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Figure 3. Generic Competitive Strategies (Porter, 2004)

The idea behind the concept of generic strategies it that competitive advantage is at heart of all strategies. Achieving competitive advantage requires a company to make a choice – which strategy to choose and what scope which will be used in order to achieve the desired advantage (Porter, 2004, 12).

4.1.1 Cost Leadership

Out of the three strategies, the cost leadership is the clearest strategy. The strategy's main objective is to be as low-cost as possible. If a company achieves and are capable of sustaining overall cost leadership, the company's performance will be above average in its sector. However, differentiation is a factor which cannot be ignored, the service or product provided by the company must be perceived as acceptable and comparable by the customers. If not, discounting of the product or service will be needed in order to increase sales. The benefits of the cost leader position might in such case be nullified. Achieving parity or proximity in the bases of differentiation relative to the competitors in order to be and above-average performer is must. Still, it depends on cost leadership in order to gain the wanted competitive advantage (Porter, 2004, 12-13). .

Parity implicates a different combination of services or products, or an identical offering of products or services attributes that is equally preferred by customers. Parity in the bases of differentiation permits a cost leader to translate its cost advantage into profits which are higher than competitors (Porter, 2004, 13).

In differentiation proximity suggest that the price discount necessary to achieve a reasonable market shares do not set-off the advantage of a cost leader although the cost leader earns above-average returns (Porter, 2004, 14).

4.1.2 Differentiation

With a differentiation strategy a company aspires to be unique within in its industry or business sector along with dimensions which are broadly valued by customers. Selecting one or several qualities that are of high value for a large number of customers is the core aim of the strategy (Porter, 2004, 14). Differentiation can be based on the product or service which is being sold. It can also be the delivery

system by which the product is being sold. A marketing approach is a particular example. Overall differentiation can be applied to all primary and secondary activities of the supply chain. A company that is able to achieve and sustain differentiation will be an above-average performer if its price premium exceeds the extra cost which has arisen in the process of being unique. A company must for that reason always be looking for ways and strategies which lead to a price premium which is greater than the cost of differentiation (Porter, 2004, 153). With the differentiation strategy, cost positioning cannot be ignored, due to the premium prices will be revoked by a well-defined inferior cost position. For this reason, a differentiator aims at proximity and parity relative to the competitors for instance by cost reduction in all areas which do not influence differentiation. A company or an organization must have unique features or be considered as unique in order to achieve premium price. Compared to the cost leadership strategy, in the differentiation strategy, a company can and should focus to differ from their competitors in several attributes (Porter 2004, 14).

Sustainability and success of the differentiation strategy has two main dependant factors; the continued perceived value from customers as well as the lack of copying or impersonating by competitors. There is constantly a risk that customers needs or perceptions will change which will lead to the elimination of the value of a certain form of differentiation. There is the risk that competitors are copying the company's strategy of differentiation which the company has chosen. The cost of differentiation may shift among competitors and affect sustainability. The following factors are keys to more sustainable differentiation (Porter 2004, 157-159).

The company's source of uniqueness involves borders. Such as proprietary learning, interrelationships, first-mover advantage and linkages have the tendencies of being further sustainable drivers of uniqueness than just a choice of uniqueness policy. Advertising does include barriers which may make it into a sustainable source (Porter 2004, 159-160).

The company has a cost advantage in differentiating. A company with a balanced and sustainable cost advantage in performing differentiation-based activities will

see greater sustainability. Companies do often not seclude the cost of their activities which are performed to differentiate themselves, instead it can be assumed that the differentiation makes economic sense (Porter, 2004, 159-160).

The sources of differentiation are multiple. The general level of difficulty of copying a differentiation strategy depends partly on the amount of sources of uniqueness a company has. The sustainability of a differentiation should not only be focused on one particular activity, for instance product design. The more differentiations a company possesses, the greater are the chances for success and sustainability, since a single basis of differentiation provides a powerful focal point for competitors (Porter, 2004, 161).

A company creates switching costs at the same time it differentiates. Switching costs are fixed costs incurred by the customers when it changes vendors, which allow a company to sustain a price premium although the product is equal to that of competitors. If differentiation creates switching costs at the same, the sustainability will be increased. Switching cost such as; differentiation itself, grow out of the way in which a products or services are utilized by the customers. Activities which make a product or company unique can frequently lift the cost of switching because customers often tailor their activities to take advantage of the company's or product's uniqueness (Porter, 2004, 162-163).

4.1.3 Focus

The focus approach is unlike the cost leadership and the differentiation strategies, since it relies on the choice of narrow competitive comprehension within an industry. Optimizing this strategy in order to target segments, the focuser seeks to gain a competitive advantage is its target segments even if it does not have an overall competitive advantage. There are two approaches related to the focus strategy, the first is based on cost focus. In the cost focus strategy a company looks for a cost advantage in its target segment, while in the second variant, differentiation focus, the company seeks for differentiation factors in the segments. Both the cost-and the differentiation variants rely on the differences between the focuser's target segments and other segment in the industry (Porter, 2004, 15-16).

Target segments needs customers with unusual needs and requirements or else the production and delivery system which best serves the target segments must differ from that of other industry segments. Cost focus takes advantage of differences in cost leadership in some segments, meanwhile differentiation focuses on taking advantage of customers with special requirements and needs in certain segments. A narrow focus is not sufficient for above-average performance (Porter, 2004, 16-18).

4.2 Value Added

Value is the figure customers are ready to pay for products or services provided from a company. Value added is the difference between what the cost is for a company to provide a product or service and what the customer pays for the product or service. There are two main key concepts of channel management, which need to be addressed in order to isolate the cost of providing a product or service. The first is the amount of value being added to the product as it moves through the chain from seller to buyer. The second is the cost of the supplier, in other words, to have value added at each level (Gattorna, 1997, 5-6).

Customer value is created when the perception of the benefits from a transaction exceeds the total cost ownership.

$$\text{Customer value} = \frac{\text{Perception of benefits}}{\text{Total cost of ownership}}$$

Formula 2. Customer Value Formula (Christopher and Peck, 2003)

In business-to-business markets in general, as customers are getting sophisticated and aware, total cost ownership can be a deciding factor when making a purchase decision. Life-cycle costs has for a long time been a crucial factor in today's markets. The marketing role is to find ways to increase customer value by improving the perceived benefits and reducing the total cost ownership.

The ultimate goal of logistics and marketing strategies is to seek to increase the customer value ratio of relative to that of competitors. It can be argued that logistics is almost unique in its ability to impact upon this ratio (Christopher and Peck, 2003, 43-45.

4.3 Customer Value and Differentiation

Logistics is a direct factor which affects customer value as well as satisfaction. This implicates that throughout the organization understanding about customer's desires and needs are required before strategies related to logistics can be developed and carried trough in order to meet the requirements (Gourdin, 2001, 2).

A service or a product is of little value to a customer if it is not available when desired and in the location where the customer wish to consume or utilize the product or service. When an organization takes the cost of goods movement towards the customer or in a timely manner makes inventory available for the customer, value which did not exist earlier has now been created. In general, there are four types of values related to products or services. The values are form, time, place and possession. Out of the four value categories, logistics creates two of them. Time and place are the values controlled by logistics, this takes shape mainly through transportation, inventories and information flow (Ballou, 2004, 18-21). Companies, which have achieved success have had tendencies of differing themselves from competitors in one or several ways, which is of importance to customers. Perceived value is in many cases based on intangibles such as brand and image as well as reputation for quality service and support. When taking logistics in to perspective, there are numerous of possibilities for focusing in differing on what is of value for customers and at the same time can assist in achieving competitive advantages (Gattorna, 1997, 6).

Uniqueness does not lead to differentiation unless it is of value for a customer. Successful differentiation discovers ways of creating value for customers, which will present a price premium which in excess of additional cost. As any organization, customers or buyers have their own value chain consisting of activities which is of value to them. A company's services or products represent a pur-

chased input to the customer's chain (Porter, 2004, 130-131). Due to similarities it is simpler understanding value chains of industrial, institutional and commercial customers. Comprehending households' value chains is less intuitional, nevertheless important. Households commit to wide range of activities, the purchased product or service are utilized in conjunction with the flow of activities from the customers' value chain. An organizations differentiations stems from how its value chain relates to their customers chain (Porter, 2004, 52-53).

Industrial, institutional and/or commercial customer's value chain reflects its course of action and strategies to implementation. While a household's value chain reflects on its members' practices and desires. What is of value for both the customer categories, grows out of in what way a product and the company supplying it, affects the customers' chains (Porter, 2004, 131).

4.4 New Value Concept

In recent years it can be seen that the goals of a company are not to create value for customers, rather to mobilize the customers to create their own value from the company's various offerings. Value has become denser in that more and more possibilities for value creation are packed into any types of offering towards customers. Successful companies do not just add value, they reinvent the value. For instance, IKEA can be shown as an example since is it not only a matter of shopping but entertainment (Harvard Business Review on Managing the Value Chain, 195).

This new logic of value has some strategic implications:

1. The new value concept requires that the company develops offerings (products and/or services) that compete for the customers' time, attention and money. The company should mobilize customers to take advantage of the intelligent offerings and create value themselves.
2. Reconfiguration of relationships and business system is required since the offerings have become more complex and varied, so do relationships nec-

essary to produce them. The most attractive offerings involve customer and suppliers, allies and business partners in new combinations.

3. The ultimate source of competitive advantage is the ability to improve the entire value-creating system and make it operate in an optimal way (Harvard Business Review on Managing the Value Chain, 196-197).

4.5 Value Chain and Competitive Advantage

When looking for a competitive advantage within the supply chain, the so called value chain concept can be of great value and provide a helpful framework for searching for the needed information and allocating it within the business unit. The approach finds and discloses link-ups in the means of which the value activities are conducted and the performance or cost of another thereby reflecting on compromises which can present competitive advantages (Gattorna, 1997, 20-21). A competitive advantage cannot be comprehended by viewing at an organization as a whole. A competitive advantage stems from several discrete activities that an organization performs: designing, producing, marketing, delivering and supporting its products. Each activity contributes to an organization's relative cost position and creates a basis of diversification (Porter, 2004, 33).

An industry- or sector wide value chain is too broad due to the obscuration of important sources of competitive advantages. Although organizations in the same industry may have chains that have similarities, the value chains of competitors often differ. The distinction among value chains is a key source of competitive advantage. A company's value chain in a specific industry might fluctuate for different items in its product line or even distribution chain, geographic areas and customers (Porter, 2004, 34-35).

In competitive conditions value is the amount customers are ready to spend for the product or service a company provides them with. Value activities can be allocated into two wide-going categories: primary and support activities. The primary activities of the value chain are noted along the bottom of Figure 4. The activities take part in the physical creation of products as well as sale and transfer to cus-

tomers. In any company of larger scale primary actives can be divided into five main generic categories as can be seen in Figure 4 (Porter, 2004, 35-36).

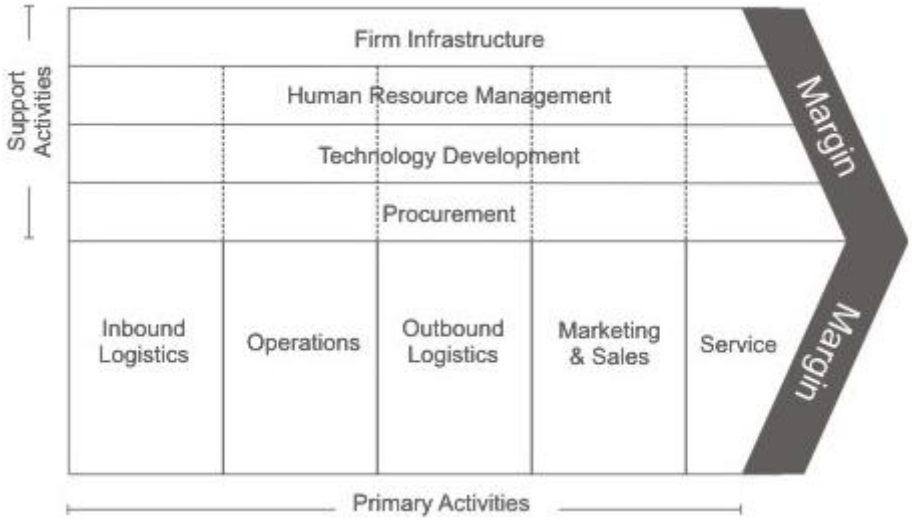

Figure 4. The Generic Value Chain (Porter, 2004)

Providing purchased inputs, human resources, technology and other relevant organization-wide functions is the main responsibility of the support activities. The spotted line in Figure 4 reflects on the fact the support activities can be affiliated with particular primary as well as support activities. According to Figure 4, the company infrastructure is not associated with any specific primary activity, but rather supports the complete chain. The value activities are cornerstones to achieving competitive advantage. How the economics together with how each activity is performed will establish if the organization is a low or high cost relative to the competitors (Porter, 2004, 36-38). In order to gain competitive advantage over competitors value needs to be delivered to customer by performing the activities in the value chain. But that is not enough, in order to get the full advantage it is of great importance that the activities are performed in a unique way which creates and leads to further differentiation (Christopher, 2011, 9-10).

As shown in Figure 4, there are five main generic categories related to primary activities, of which all are needed in order to be a competitor in any industry. Each and every category can be divided into different activities depending on the

specific industry and the strategies utilized by the organization. The primary activities are the following: inbound logistics, operational activities, outbound logistics, marketing and sales as well as service. All of the categories are crucial in achieving a competitive advantage. Focus on either category needs to be adjusted depending on the industry (Porter, 2004, 39-40). The primary activities are assisted by external purchased inputs (procurement), human resources and technology. The primary activities require strategic and well-planned management as well as financial and quality management activities (firm infrastructure). Differences between value chains have tendencies of becoming sources of competitive advantage (Skjøtt-Larsen et al. 2007, 18-19).

4.6 Three Activity Types

The identification of value activities demands the isolation of activities that are related to technology or is of strategic distinction. The value activities and accounting classifications are seldom the same. Accounting groups, for instance burden, overhead, and direct labor, group together with technology opposing technologies and separate cost that are all a part of the related activities. In addition, in each category of primary and support activities, there are three kinds of activities which have their role in achieving a competitive advantage (Porter, 2004, 38-39).

All organizations have direct, indirect and quality assurances value activities. Direct activities are directly engaged in creating customer value, for instance product design, assembly, parts machining, advertising and sales operations. Indirect activities are an activity type which enables the performing activities n a continuing basis. Examples of indirect activities are: maintenance, scheduling, research activities, sales force administration and operation of facilities. The third activity type is quality assurance. The main purpose of this activity is to ensure the quality of other activities. Quality assurance is made possible by for instance checking, adjusting, monitoring, inspecting as well as testing and reviewing. Quality can be achieved in various ways, with value activities is, for this reason quality assurance is not a synonymous with quality management. Making and knowing the differ-

ence among the three activity types is crucial when diagnosing competitive advantage (Porter, 2004, 43-45).

4.7 Importance of Horizontal Strategies

Horizontal integration is an instrument which is utilized by entities down the supply chain in order to expand market penetration as well as instituting growth. Horizontal integration is based on the expansion of a business and also expansion within the SC. The expansion can be actualized either within the same industry but also a separate business. An organization can reach this kind of growth through internal expansion. A practical example of this is when a retailer increases the variety of products or services it sells within a particular category (Mitzsheva, Definition of Horizontal Integration in a Supply Chain).

In order to formulate a horizontal strategy, a requirement is to systematically identify all tangible interrelationships which are or will be attendant among organizations business units. Also all value chains and value activities needs to be scrutinized for possibilities for sharing of interrelationships. Finding all possible intangible interrelationships as well as new industries is of significance when making strategies. Signs of potential intangible interrelationships have resemblance in generic strategy as well as value chain configuration (Porter, 2004, 368-374).

As of the situation in today's markets, horizontal strategies can no longer be ignored. Interrelationships between business units and the capability to utilize them have been increasing during the past decades. The diversification philosophy is changing. There have been notable changes from the 1970s concerning the diversification strategies within organizations, now it is mostly common that emphasis is related to diversification. Another aspect of horizontal strategies can be seen in when emphasis is shifting from growth to performance. As we have encountered changes in most of developed world, growth has slowed down and competition increased. For this reason the emphasis has shifted from growth to advancing competitive advantage. The growing importance of horizontal strategy can be seen when technological changes are spreading interrelationships and making them more achievable. Technology is breaking down the walls between industries,

which is resulting in that the industries are driven together, especially industries based on information and electronic technology. New technologies are allowing the sharing of activities along the business unit lines where it was not possible earlier. The growing refinement of information systems is also a strong force in the inauguration of possibilities for interrelationships (Porter, 2004, 320-321).

As multipoint competition is increasing, this is a compelling motivation for horizontal strategy. As it is becoming more common that organizations are forced to search for interrelationships amongst business units there is an increasing presence of so called multipoint competitors. Multipoint competitors can be defined as firms or organizations which compete with each other within a number of businesses (Porter, 2004, 321-322).

5 METHODS FOR PERFORMANCE IMPROVEMENT

5.1 SRAM – A Decision-Making Model

The author Napoleon Hill has said: “The way to develop decisiveness is to start where you are, with the very next question you face…”. When a company wants to make a significant change for instance, initiating a performance or efficiency project, then sound decision-making is a must (IIL, Problem solving and decision-making, 2010-2012, chapter 3-11).

Before starting a major change, a certain preparation is required. The company needs to define and clarify expectations and requirements; identify the stakeholders; comprehend the “big picture”; understand the role and gather both logical and emotional perspectives. Gathering expectation and requirements includes an understanding of the following basic parameters: time, costs, quality and risks. The SRAM-model can be classified as a basic and traditional decision-making model that can be used in most situations. The model is based on following major steps or activities:

1. **S**ituation; understand the big picture context, the stakeholders, their perspectives, and determine what is required – the objective.
2. **R**oot causes; gather facts to avoid reacting to what you think the issue is.
3. **A**ct; identify alternative approaches to resolve the situation (problem), and select most appropriate course of action.
4. **M**onitor the action taken, and verify that the situation has been resolved or the expected result has been achieved.

As support for use of the SRAM-model, checklists can be used in order to start in the right direction to resolve issues, e.g. in the supply chain and make good decisions. Optimal decisions made using the SRAM-model are meaningful, measurable and actionable. (IIL, Problem solving and decision-making, 2010-2012, chapter 3-23).

5.2 The EFQM-Method for Self-Assessment

Self-assessment is a comprehensive, systematic and regular method for review of an organization´s activities referenced against a model of business excellence. It was decided to use the EFQM Model for Business Excellence as base for the self-assessment framework. This model has been developed by the European Foundation for Quality Management (EFQM, 1999, 6-7).

The main target of self-assessment is to understand – in a structured way - the strengths and the areas for improvement in an organization. As outcome of the self-assessment, improvement actions are planned, implemented and monitored over time. The method gives opportunities to share excellent approaches within different areas of the organization. The employees get a possibility to develop and learn how to apply the method and related improvements actions. In some organizations, internal awards have been given to the employees as recognition of progress based on the assessment (EFQM, 1999, 7).

The EFQM Model – as shown in figure 5 - has the following key elements:

- Enablers; what an organization does
- Results; what an organization has achieved or achieves

The key element “Enablers” is affected by the organizations’:

- Leadership, i.e. clear direction and the capacity to develop and facilitate the objectives.
- Policy and strategy, i.e. manage their activities with clear, values, aims and accountability.
- People, i.e. encourage people to participate, develop and fulfil their potential.
- Partnership and Resources, i.e. develop partnerships and manage resources to maximum effectiveness.
- Processes, i.e. develop, manage and improve processes to support its priorities.

The key element “Results” can be divided into:

- Customer Results, i.e. measurement of customer satisfaction and fulfillment of expectations.
- People Results, i.e. measurement of people satisfaction.
- Society Results, i.e. measurement of results with respect to community and society.
- Key Performance Results, i.e. a systematic measurement of performance in relation to policy and strategies.

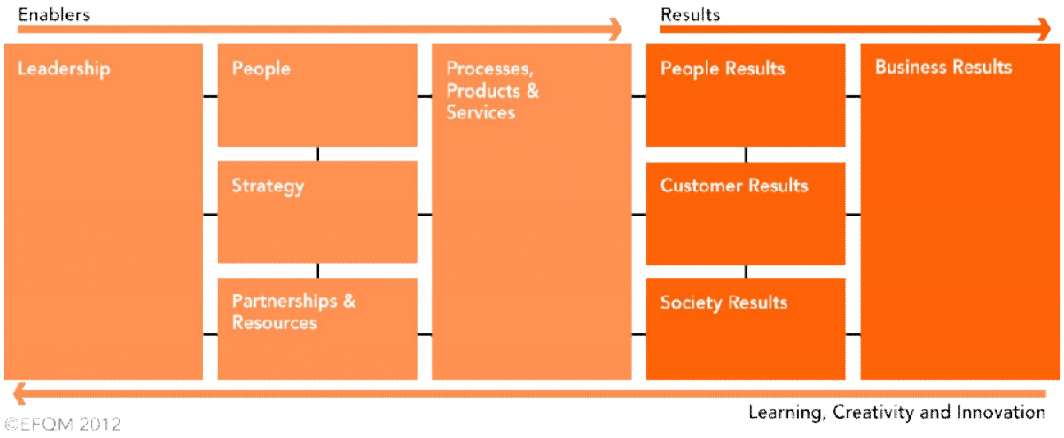

Figure 5. The EFQM Model

When using the EFQM Model a special working logic – known as RADAR – consists of the following ingredients: Results, Approach, Deployment, Assessment and Review is normally applied. Based on this logic, the organization needs to determine the *Results* it is aiming for based on agreed strategies and policies. When the planned results are agreed, then an integrated set of relevant *Approaches* - required delivering the results – need to be developed and *Deployed* in a systematic way. When the approaches are implemented, the *Assess* and *Review* of the approaches follows. This phase is based on monitoring and analysis of the results achieved and ongoing learning activities. Finally, identification and implementation of possible improvement areas are executed - where needed (EFQM, 1999, 9-10).

By using the EFQM Model and related way-of-working in the supply chain and logistics function, an organization can obtain vital information about its present strengths and weaknesses (areas for improvement). The model can provide a map for the employees in the supply chain/logistics department to follow and help them to identify how they can contribute to improvements and successful results (= excellence).

5.3 The Kaizen Approach

Kaizen is a philosophy and approach developed in Japan for continuous and incremental improvement of performance. The main reasons for using the Kaizen approach are to enhance the relationship with customers and to improve the position in the marketplace. The approach requires process knowledge, teamwork, dedication and a Deming Improvement Cycle (Dailey, 2005, 11).

The Plan-Do-Check-Act method (PDCA) was developed from the Deming Improvement Cycle. The PDCA cycle emphasizes the prevention of error recurrence by establishing standards and the on-going modification of those standards. The PDCA cycle is very applicable in production, logistics and quality control activities. The PDCA cycle consists of four important steps for making improvements as described in Figure 6. The steps are defined as:

1. Plan; gather information and ideas. Thereafter, select an optimal approach for an improvement action.
2. Do; Implement the changes. This step can be considered as a “prototype” step in order to demonstrate the practicality of the changes(s).
3. Check; Monitor and gather data on the effects of the implemented change. Compare performance with both the previous and new processes compared to plan. Explain and report results with focus on variations.
4. Act; Implement the changes by updating the documentation, like product specifications, process instructions, operating procedures, training materials etc. (Dailey, 2005, 11-12).

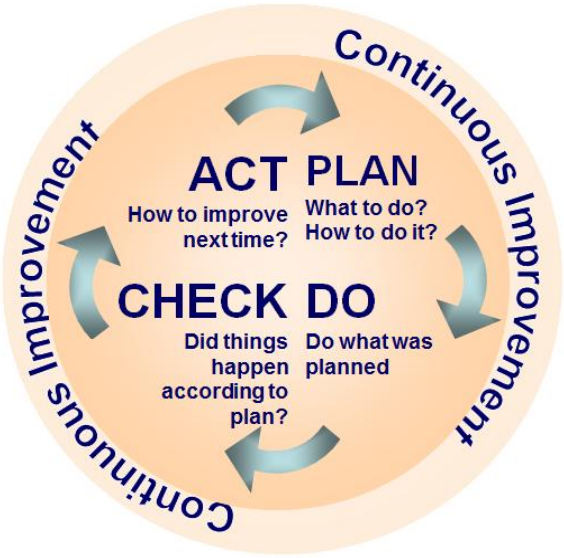

Figure 6. The PDCA-Cycle

Kaizen sees improving the process as the path to performance improvement. The first issue is to improve the product or service by adding features based on the customer´s perception of value received results in a better product. Secondly, reducing cost or amount of input such as material, labor, capital or managerial expense should mean a less costly product. Thirdly, reducing the variation in the output of the process means a more consistent product (Dailey, 2005, 27).

Essential steps in Kaizen are:

1. Standardize the process; there should only be one way to do the process. Say no to status quo, implement new methods and assume they will work.
2. Baseline the process; imitate those who do the process in the best way known.
3. Improve the process; gain knowledge and practical experience about the process; then begin to change and fine tune the process for the better. If something is wrong, correct it. Accept no excuses and make things happen.
4. Improve everything continuously. Never stop trying to improve.

5. Be economical. Save money through small improvements and spend the saved money on further improvements.
6. Empower everyone to take part in solving the faced problems.

The Kaizen approach is often used by organizations when implementing Lean concepts in the activities. The Kaizen approach with related tools can be perfectly used and implemented in the supply chain and logistics functions. The main purpose should be to minimize unnecessary activities (= waste) in the relevant processes in order to satisfy the customer needs and expectations and – naturally - to improve the organization's profitability and competitiveness (Mleczkowska, Magdalena, 2014, Kaizen).

6 RESEARCH METHODOLOGY AND PRESENTATION OF RESULTS

6.1 Research Methods

Research is a term commonly used to describe the search for knowledge and information. Research is referred to as a scientific and systematic search for relevant information of a particular topic. Briefly defined, research is an art of scientific investigation (Kothari, 2004, 1-2). Research consists of three primary objectives: theoretical, factual and application. By using various strategies and methods of research the objectives can be reached (Singh, 2006, 99).

According to Singh, there are two primary disciplines of research methodology, quantitative and qualitative approaches. The qualitative research methods are mainly utilized and are of significance in the area of education. The quantitative research approach is commonly practiced in historical and philosophical researches. The quantitative approach is commonly applied in scientific inquires and researches (Singh, 2006, 125).

Quantitative research method is based on facts which can be expressed in terms of quantity or amounts. While qualitative research, on the other hand, is focused with qualitative phenomena, for instance, phenomena related to or involve quality or kind. Qualitative research seeks to find out the basic desires and motives by utilizing interviews for the purpose. Sentence completion tests, word association tests, story completion tests and similar other methods are all other ways for conducting qualitative research. Qualitative research is also the research for opinions and attitudes. Qualitative research allows the analyzing of factors that motivate people to approve or disapprove an especial object or even act in a particular way. (Kothari, 2004, 3-4)

Out of the above mentioned research methods the most suitable for this thesis was the qualitative research method. The primary reason for choosing this research method was to get opinions of the interviewees, which is of great significance for this thesis. Another reason for choosing qualitative research was since it allows

the analyzing of factors that motivate people. For this thesis face-to-face interviews were conducted with four persons from the logistics department of the case company.

6.2 Case Study

Case study is both tool as well as method for conducting various types of research. Important characteristics of a well-rounded case study include continuity, completeness of data and also validity and reliability of data (Singh, 2006, 147). There are six primary types of case studies, in this research the types which will used are; activity analysis and content or document analysis. According to Singh, both in an industry and in various types of social agencies analyzing of related processes and activities which individuals are motivated to perform is of importance. In any field of work and at all responsibility levels the process of analysis is suitable. In content analysis, which is commonly known as document analysis, the main focus is dealing with the systematic examination of current records or documents as sources of data. When conducting documentary analysis, official reports and records, printed forms, text-books, reference books, letters, autobiographies diaries, pictures and films are sources of data which are widely accepted. A factor which needs to be taken into consideration is that when utilizing documentary sources the data appearing in print is necessarily not trustworthy. When evaluating documents which are used in descriptive research, the documents need to be subjected to the same type of criticism employed by the historian. Adding crucial knowledge to the research area or yielding information that is helpful when evaluating and improving social or educational purposes is the main intention of document analysis (Singh, 2006, 147-148, 150).

According to Patel and Davidson (2011, 56-57) a case study means that the research is being conducted on a selected small distinct group. What can be referred to a case can consist of a group of individuals, an organization or even various situations. It is even possible to research more than one case when making a case study, for instance two organizations. When conducting a case study it is im-

portant to move forward in the research from a holistic approach in order to get as much information as possible.

Benefits of the case study can be that it enables for the research to concentrate on a specific phenomena or event and elucidate which factors are the affecting ones (Bell 2000, 16). Case studies are widely utilized when researching processes as well as changes. What needs to be taken into consideration is that during the execution of the case study not to generalize the results which are achieved from the conducted research. The outcome of the case study should only concern the limited research area (Patel och Davidson, 2011, 57).

When conducting a case study for research purposes the primary objective is the development of the case on the basis diagnosis that is conducted on post-records of the case. Another objective of a case study is to establish the effect and cause of relationships. Important characteristics of a well conducted case study should consist of completeness of data, continuity trough out the study, validity of data as well as scientific recordings and synthesis (Singh, 2006, 147, 150).

In this thesis the empirical research is partly based on a case study since it conforms in the most practical way to answer to the problem area and questions of the thesis. In the empirical research focus is set on the case company Wärtsilä with the Power Plants division, their strategies, and way of working as well as drivers in focus. The research is limited to a case study and affects on the logistics function of the mentioned case company.

6.3 Reliability and Validity

To conduct tests of reliability is another considerable test of concrete measures. When a measuring tool is considered reliable it provides consistent results. Reliable measuring instrument does contribute to validity. Reliable measuring instruments are contributors to validity but a reliable instrument does not necessarily need to be a valid instrument. Reliability does not bring the same value as validity does. But the reliability of a study is simpler assessed than validity. If the quality of reliability can be convinced with the help of an instrument, then while utilizing

the instrument, it is possible to assure confidence in that situational and transitory factors are not intervening. According to Kothari (2004), there are two primary aspects which are of significance; equivalence and stability. Factors regarding the equivalence aspect are the amount of errors which might get introduced by various researchers or by various samples of the research problem and area which is being studied. If two or more researchers test for the equivalence of measurements and compare their observations of the same events, the research can guarantee useful and satisfactory results. Regarding the stability aspect, it concerns the securing of consistent results with repeated measurements of the same person and with the same instrument. The degree of stability is commonly specified by comparing the results of reiterated measurements (Kothari, 2004, 74).

The reliability of research can be improved in various ways; one way is by standardizing the conditions under which the measurement takes place. The standardization can be achieved by ensuring that external sources of variation such as boredom, fatigue, are minimized as much as possible. Another way is by thoroughly designed directions for measurement with no variation from group to group. If competent and trained researchers conduct the research the equivalence aspect will be improved. Another way is by widening the sample of items utilized (Kothari, 2004, 74-75).

Validity refers to the degree of which an instrument measures what it is supposed to be measuring. Validity can be sub-categorized as external and internal validity. Validity can be identified as a utility with the implication to which disparities discovered by utilizing a measuring instrument reflects the true distinction among the test subjects. In order to provide valid results to a research, the research should ask the question; how can validity be determined without directly confirming knowledge? One possible answer is by searching for other relevant evidence which confirms the answers that have been reached with the selected measuring tool. What is also of importance is that the evidence often depends on the nature of the research area and problem, and the judgment of the researcher conducting the study. In this connection three types of validity can be considered. The three types are content validity, criterion-related validity and construct validity. Content

validity is the extent to which a measuring instrument provides sufficient reporting of the topic under study. Criterion-related validity is related to the ability which predicts the outcome or the assessing of the existence of current conditions. The concerned criteria should include qualities related to relevance, freedom from bias, reliability and availability. Construct validity is the most implex and abstract measuring tool. A measure should supply construct validity to the extent that it confirms to the predicted correlations with other theoretical ideas (Kothari, 2004, 73-74).

6.4 Wärtsilä - A Presentation of The Case Company

The case company – Wärtsilä Power Plants – is a division within Wärtsilä Corporation. Wärtsilä Corporation consists of three main divisions, Ship Power, Power Plants and Services. For 180 years, Wärtsilä has been at the frontier of engineering innovation. Wärtsilä's vision and ingenuity means that they provide their customers with smart solutions that keep their customers one step ahead. Together with their customer's, Wärtsilä aims to move beyond boundaries and shaping the future market. (Wärtsilä Homepage)

Wärtsilä aims to be the leader in complete lifecycle power solutions for the global marine markets and selected energy markets worldwide. Wärtsilä sees growth potential in gas power plants as part of our Smart Power Generation concept as well as in gas-fuelled engines and related systems for the marine market and in medium-scale Liquid Natural Gas (LNG) infrastructure development projects. Wärtsilä sees their strengths in their technological leadership, an integrated product and service offering, the close and long-standing customer relationships and the unparalleled global presence. Wärtsilä is determined to capture growth opportunities within their end markets, while maintaining a solid profitability (Wärtsilä Corporation annual report 2013).

In 2013 Wärtsilä employed nearly 19000 people of 114 nationalities. (Wärtsilä Corporate Presentation, 2013) Wärtsilä has operations in over 200 locations in nearly 70 countries around the world; their headquarters are located in Helsinki, Finland. Wärtsilä is listed on the NASDAQ OMX Helsinki, Finland (Wärtsilä

Corporation Annual Report, 2013). Order intake for the business year 2013 was 4,872 million EUR and the Order book 31 December 2013 amounted to 4,426 million EUR. The financial key figures can be seen from Figures 7 and 8 below.

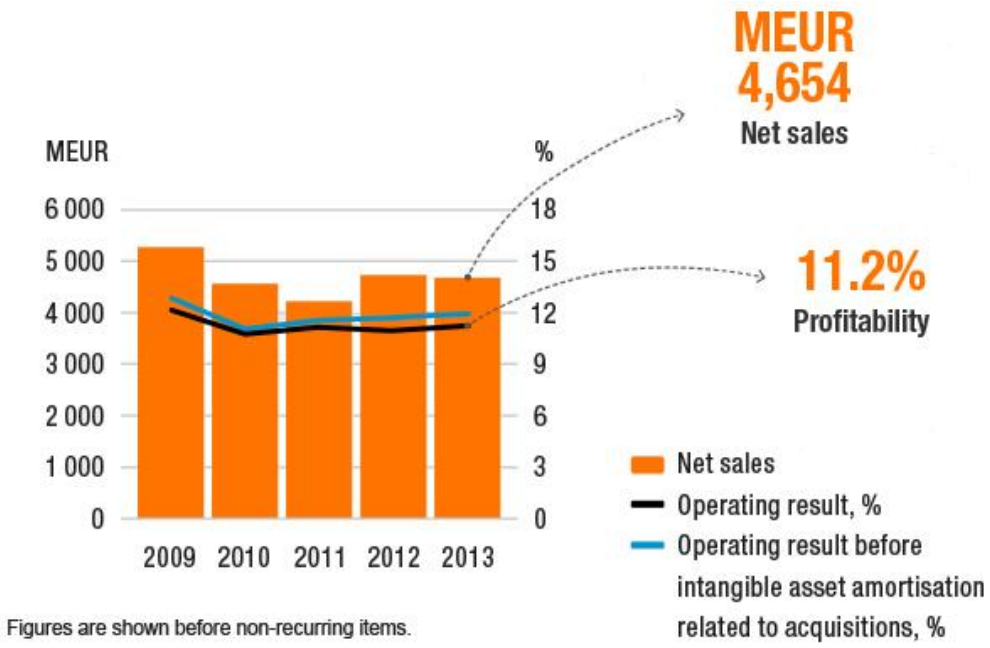

Figure 7. Wärtsilä Net Sales and Operating Result 2009-2013 (Wärtsilä Corporation Annual Report 2013)

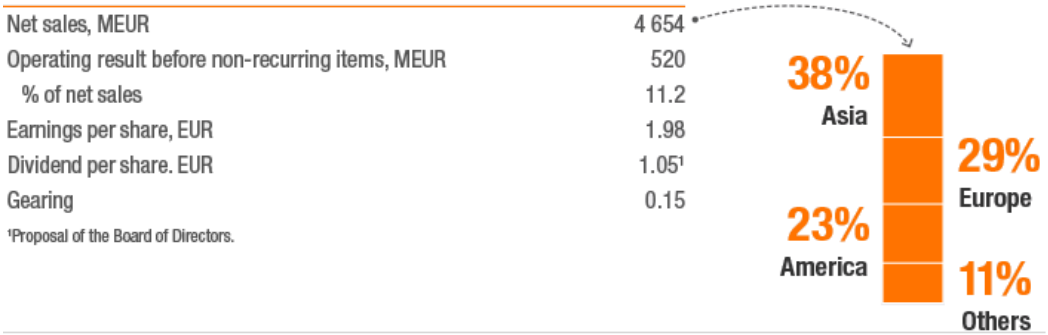

Figure 8. Wärtsilä Financial Key figures 2013 (Wärtsilä Corporation Annual Report 2013)

Wärtsilä's mission statement is based on providing life cycle solution to improve their customers business, even to create better technologies which favor both the environment and customers.

The vision within Wärtsilä Vision is described as “to be their customer’s most valuable business partner”.

Wärtsilä’s values consist of three related activities:

- *Energy*, capturing of opportunities and making things happen.
- *Excellence*, doing things better than anyone else in the industry.
- *Excitement*, encourage openness, respect and trust to create excitement. (Wärtsilä Homepage)

6.4.1 Wärtsilä Power Plants in Brief

The Power Plants division of Wärtsilä has their headquarter located in Vaasa, Finland. Wärtsilä Power Plants is globally recognized leader in complete lifecycle power solutions for the energy market. The solutions which Wärtsilä Power Plants offer to their customers are considered highly efficient and advanced. The solutions are environmentally friendly and modern, which allow the maximum integration on intermit renewable power generation. Wärtsilä offers multi-fuel power solutions, including baseload generation, peaking and load following operation. Dynamic system balancing and ultra-fast grid reserve is also what is offered to the customers (Wärtsilä Intranet, 2014). Up to the year 2012 Wärtsilä Power Plants have been responsible for installing close to 50 Gigawatt (GW) in 169 countries on six continents (Power Plants Strategy 2012). Wärtsilä is able to provide power solutions to its customers in urban areas as well as in the most remote and demanding places (Wärtsilä Corporation annual report 2013).

The overall goal of the Power Plants division is to be a globally recognized leader in gas and liquid fuel power plants. Promoting the Smart Power Generation (SPG) model to the environmentally conscious and increasingly dynamic energy market, in order to make a more sustainable, cost effective and reliable power systems globally is another strategic goal of Wärtsilä Power Plants. (This is Wärtsilä Brochure 2013)

Wärtsilä has got a strong position in the gas power plant market; the aim is to grow stronger in large gas power plant markets. Wärtsilä Power Plants has already got a leading position in Heavy Fuel Oil (HFO) power plant market. Wärtsilä intends on maintaining that position. Another strategic goal is to grow further and become a recognized actor in oil & gas as well as emergency power applications. Wärtsilä has a strategic aim to continuously develop their capabilities in power plants using renewable energy (Wärtsilä Homepage, 2014).

Concerning the project management and related logistics process the following strategic objectives are spelled out; scope from power plant process equipment delivery with full engineering, procurement and construction (EPC), experienced project management, way of working adapted to customer expectations, fast delivery and guaranteed delivery time. Also establishing control points within the supply chain in order to detect and correct non-conformities in time so that there are no delays in the shipments and deliveries (Wärtsilä Intranet, 2014).

The growth of the population as well as economic development is the primary business driver for the demand of power generation. As the consumption of electricity grows, the constant demand for new power generation equipment as well as replacement equipment for older capacity increases in corresponding manner. In the future, growth is expected to be higher in countries which are not member of the Organization for Economic Co-operation and Development (OECD), due to increasing industrialization and improving living standards. While economic development is a less crucial driver in the OECD countries, the ageing installed capacity will drive demand for new investments. Crucial drivers contain stricter environmental regulations and the aim for low-carbon power systems, which are incentive investments in renewable energy. Renewable power solutions, such as wind power, lead to unsuspected grid stability defiance's, which demand additional backup and balancing power. Consequently, large scale use of renewable power increases the need for reliable, flexible and efficient power which Wärtsilä's solutions provide (This is Wärtsilä Brochure 2013).

6.4.2 Wärtsilä Supply Management

The main purpose of the supply management set-up - which can be seen in Figure 9 - is in a successful manner to manage business driven and competitive supplies with right quality as well as optimal lead time as well as on-time delivery and lowest cost according to Divisions/Business Lines specific targets and requirements. Managing of the strategic sourcing activities for the whole lifecycle of the products, solutions and services is a part of the concept (Wärtsilä Intranet).

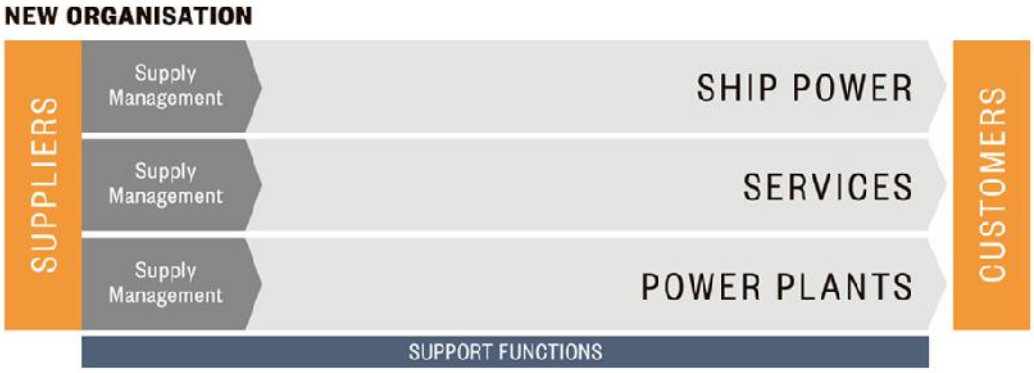

Figure 9. Wärtsilä's Organization Chart (Wärtsilä Intranet)

Wärtsilä have a manufacturing process which is focused on assembly, test running and finishing of the products. Due to the strategy, the Wärtsilä business model is highly connected to a broad network of suppliers, which guarantees flexibility in production capacity. Wärtsilä assess and manages all suppliers by using a company specific supplier management system. Wärtsilä conducts - on regular basis - supplier evaluations. The supplier assessments focus on several critical indicators in which Wärtsilä expect the suppliers to maintain high standards and performance: compliance with relevant legislation; environmental, occupational health and safety and quality management; process mapping and quality plans and social performance (This is Wärtsilä Brochure 2013).

From the beginning of the year 2014 Wärtsilä has gone through large scale changes in the entire organization, mostly towards a more entrepreneurial direction. Wärtsilä Supply Management (WSM) was one of the affected internal organizations. Since the middle of 2010 until the end of 2013, WSM was responsible for all sourcing activities for all divisions and business lines. The activities were:

- Component category management.
- Strategic purchasing.
- Supplier evaluation and related quality development activities.
- Emerging market sourcing.
- In-direct purchasing activities.

Now all business lines within Wärtsilä have their own supply management organizations. As can be seen in Figure 10, Wärtsilä Power Plants have divided their supply functions into five internal core departments. The five departments are managed by Line Managers, who are reporting to a Director for the entire Supply Management department. Wärtsilä Power Plants' entire supply organization currently consists of approximately 70 employees (Wärtsilä Intranet).

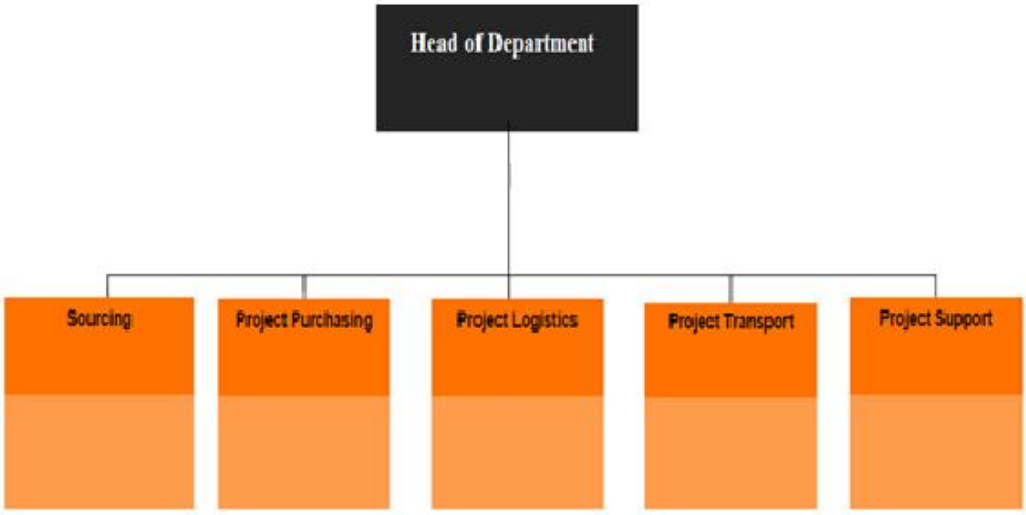

Figure 10. Wärtsilä Power Plants, Supply Management Structure **(**Wärtsilä Intranet)

The sourcing department within Wärtsilä Power Plants is new departments since 2014, the primary responsibilities of the sourcing department is maintaining supplier relations and manage supplier agreements, including price lists. The department consist of supplier development engineers, strategic purchasers also category managers (Wärtsilä Intranet, 2014).

The project purchasing department is responsible for all purchases which are needed for a power plant project. The purchasing department is responsible for communicating with the supplier and project teams (Wärtsilä Intranet, 2014).

Project logistics has previously been part of the Wärtsilä Power Plant project management organization. Due to organizational changes project logistics is now part of the supply management organization. The main responsibility of the project logistics department is taking care of activates related to outbound logistics, activities such as collection of goods, monitoring and follow-up of shipments and deliveries in on-going projects. Communicating and coordinating with project teams, business control units, forwarding agents, suppliers and port operators is part of the daily routine in the project logistics department (Wärtsilä Intranet, 2014).

The project transport department's main responsibilities lay in planning, and make agreements regarding transports for projects, both with forwarders and shipping lines. Planning and estimating cargo amounts along side with the sales teams are tasks related to the department (Wärtsilä Intranet, 2014).

The project support department's main focus is product and volume planning, mainly with larger suppliers, but also internal functions. Process development is also among the main task of the department (Wärtsilä Intranet, 2014).

6.5 Presentation of Interview Results

In this thesis four persons from the case company's project logistics department were interviewed. The ages of the interviewed persons vary from the age of 24 to the age of 33 and working experience varies from two to twelve years in the case company. In the conducted interviews, which took place on separate occasions, the interviewees were asked a total of twenty qualitative questions and they had the possibility to answer all questions based upon experience from the field of logistics and supply management as well as to describe their understanding and opinions in questions related to the case company. The interviewees will be referred to as interviewees A, B, C, D.

6.5.1 Roles and Responsibilities

As a starting question the interviewees were asked what their roles and responsibilities were within their logistics department. Interviewees A and C mentioned that they are logistic coordinators and that their primary role and responsibility was to move project material from point X to point Y domestically and to various steps in-between. Interviewee A said that they get many more responsibilities than those mentioned in the work description for a logistics coordinator. Interviewee A mentioned that within the department there are four separate logistics teams which are divided based on geographical areas. The areas are as following; Africa, Asia & Middle East, Europe & India and the Americas. The teams consist of two logistics coordinators and one transport manager. When interviewee B was asked the first question, the interviewee thoroughly explained the importance of a logistics coordinator concerning the packaging and the markings of the packages and containers. Interviewee B clearly stated that one of their primary roles is to check and enforce that the suppliers are packaging the material according to the transport mode, in which the packages or containers will be shipped to end customer. Interviewee D explains the roles of a senior logistic coordinator as collecting goods to the port of shipment for sea freight. Another important part of the job is to coach the goods suppliers regarding instructions for marking and packing of the materials. Arranging container transports is to some extent part of the daily work. Interviewee D mentioned that goods related information in order to enable the goods to be exported, need to be provided internally to transport manager, project teams, controllers and export coordinators and externally to suppliers, port operators, forwarders and their representatives. Additionally interviewee D is responsible for arranging smaller consignments by air and courier and truck freight. Interviewee D. verifies that packing lists, markings and support documentation are made correctly for each transportable unit (boxes, containers and break bulk).

6.5.2 Logistics Strategies and Competitive Advantage

The second question asked from the interviewees was related to the department's primary logistics strategies and how they are accomplished as well and followed.

Interviewee A started with saying that in his understanding the primary logistics strategy is to plan for all possible situations and to keep close records of what has gone well and not so well in order to optimize the work as much as possible. Interviewee B stated that it is not very easy making logistics strategies since all power plants are unique and have different requirements. But interviewee B said that if there was an overall strategy, it would be to prepare and follow shipment plans which are based on the project schedule that will ensure that the constructing and installation works at the sites proceed continuously. According to interviewee C the primary strategy is on-time delivery but also to meet shipment plan requirements.

In interviewee D's opinion the primary logistic strategies of the department consist of planning whatever can be planned to prevent future problems. Interviewee D continues with saying that the main target is to have the goods delivered on time within the project schedule. All are facts that may force projects to a critical level, and just on time has to be fully implemented in order to have the projects gathered to deadline.

The interviewees were asked what the primary corporate strategy is and if the strategies are be related to their logistics function. Interviewee A responded briefly and concisely, "to deliver quality goods within a certain amount of time." Interviewee B had difficulty seeing the link between the corporate strategies and how they can relate to their logistic department, but the interviewee said that the logistics department's main challenge is to keep up with the corporate strategic goals, since the company's business is expanding and the projects are getting larger and more complex. Interviewee C is of the opinion that it can be linked to providing customers with smooth and efficient logistics process which will add value for the customer. Interviewee C wanted to prioritize the importance to minimize delays as well as to ensure the quality of the equipment and documentation delivered. Based on interviewee D's understanding, to have project logistic cooperation partners having framework agreement, Wärtsilä is aiming to reach the best level of securing the operations from unnecessary risks and aim to reach the for best possible operational performance. Interviewee D says that this enables logis-

tics to have a “standardized way of working” since the different operators know the way of working and Wärtsilä know their all-in savings. Collaboration and team work internally are essential aspects in enabling Wärtsilä to reach the set goals. Interviewee D put much focus on three factors, time, cost and quality. Time is a crucial factor in delivery schedules for suppliers, forwarders and logistics coordinators. Cost is based on sourcing prices and locations combined with collection and outbound delivery costs which result in total cost. The new logistic software is ensuring that the correct goods are reaching the correct place. The chain reaction can continue with proper information to ensure a high quality overall performance when deliveries of Power Plants components take place

After the above mentioned question the interviewees were asked how they would define their company’s logistics competitive advantages compared to the competitors. Interviewee D says that Wärtsilä Power Plants, being a part of a company with worldwide activities, there might be advantages in being a partner with economically strong position, advantages while transports are being made, the possibility to impact (via network companies) the situation whenever a difficult situation appears. Interviewee D continues with saying that huge volumes at each power plant, in each area and on annual basis would give some advantage in getting freight costs to a competitive level and to implement time saving way of working. Both interviewee A and B agreed that they do not have sufficient knowledge concerning how competitors handle their logistics but in their opinion the competitive advantage could be that the case company provides short delivery times and transports at cost effective prices. Interviewee B said that in Free On Board projects (FOB), customers have shared that the Wärtsilä Power Plants logistics department and employees are professional and qualified and that knowledge and knowhow is broader than that of competitors in the same business. Of course, there is room for improvements in their own department as well. Interviewee C did not want to take any standpoint of this question due to the lack of experience working for other companies within the same industry.

As next the interviewees were asked which factors in their opinion make their work and performance different from that of competitors’ work. Interviewee D

started by saying that Wärtsilä might be different from their competitors, since they are building turnkey power plants in distant and remote locations, not only sending a few core products to some destinations. Interviewee D thinks that Wärtsilä Power Plants have a quite decisive way of working, which may enable forwarders to undertake total work package responsibility in inland arrangements. Interviewee D continues with saying that this gives Power Plants a positive interface to the end customer, once the framework agreement owners with their local operators has been tested before. Interviewees A, B and C stated again that they are not aware of the competitors' ways of working and performance and for that reason not commenting any differing factors.

6.5.3 Targets, Objectives and KPIs in Logistics

The interviewees were asked five questions related to their targets and objectives as well as about performance measuring and KPIs. The first of the five questions was what kind of targets and main objectives their department has. Interviewee D commented briefly that the primary objective of the department is striving to have goods at the right place at right the time and, of course, at the right cost. Interviewee B was quick to respond that the main target and objective is to support the projects and projects teams to the best possible ability and to make as efficient and cost effective logistic arrangements as possible in order to ensure the success of the projects. The opinion of interviewee A was to have a certain amount of volume delivered each quarter. It is crucial to deliver projects on time, since the transport can affect the workload at site. Interviewee C was of the opinion that the primary objective is to secure on-time delivery of the power plant equipment within the scope and of the budget.

A follow up question to the previous question which was asked from the interviewees was how the activities and targets are measured and followed up. Interviewee A stated that the department's general manager collects all logistics related information, makes statistics and compares the results to the same periods of previous years. Interviewee B mentioned that activities and targets are measured when checking for the total number of shipments, volumes and transport modes

used during a decided period. According to interviewee C, the work of the logistics department can only be measured by delivery reliability and the schedules. Interviewee D says that one way activities can be followed is by using and checking the new logistics software, Logwis, and measured when the power plant projects enter into to the commissioning phase.

“What kind of Key Performance Indicators or measures are used and monitored within your department” was a question asked from the interviewees. Interviewee A explained that there are quarterly goals; he was not able to explain the quarterly goals more in detail. By gathering as much goods as possible before shipments, in this way the interviewee says that they can deliver a lot of material in big shipments instead of using many smaller shipments. A factor of significance is to always be prepared for what kind of workload and projects are incoming, interviewee A ends. Interviewee B says that - on the logistics department’s behalf - they do not have direct measures, but the purchase department checks savings. The transport department follows the actual cost in comparison to the budgeted transport cost budget. Interviewee C was of the same opinion as Interviewee B, that the logistic department does not have any direct KPI which can be measured. Interviewee D was of the opinion that the logistics department does not have any direct KPIs while the purchasing and transport department does.

The follow up question for the previous question was if the department uses any KPIs in its improvement process, and interviewees were asked to explain if so. Both interviewees A and B had the same opinion that they have a new logistics software in their division and with this software all stakeholders of a project are able to work within the same frame. Interviewees D and C chose based on the answer of the previous question not to answer the question at all.

The interviewees were asked how costs are defined and monitored. Interviewees A and B both agreed that that in most cases they personally do not monitor the costs since frame agreements exists between external parties, suppliers as well as service providers. Interviewee B mentions that in projects which are to be delivered on FOB delivery terms, sometimes pre-FOB costs are compared to actual

costs. Interviewee C had no direct answer to this question, but the interviewee referred to that projects have their own costs, which are then monitored by the project controller and manager.

6.5.4 Logistics and External Partners

The interviewees were asked two questions relating to external partners and logistics. The first of the questions was how they identify and prioritize opportunities for improvement within their logistics department and why. In interviewee B's opinion at the moment they have only one responsible logistic coordinator per project. Interviewee B would like to see that they had one or two coordinators who support and make frame agreements and one logistic manager that is responsible for all the logistics related issues in a project. Interviewee A says that they do have monthly meetings and quarterly meetings where they discuss certain problems that might have occurred and how to deal with certain problems. Interviewee C commented that priorities are probably based on their impact on quality and cost.

The interviewees were asked if they personally are involved in performance improvement activities within their department. If they are involved, the interviewees were asked to explain the improvement process. Interviewee B clearly indicated that due to the current workload there is no time to participate in improvement processes within the department while Interviewee A says that there is heavy involvement in development projects at the moment. Interviewee A is a key user for the new logistic software which has recently been developed and taken into use. Interviewee A adds that hopefully using this tool they are able to reduce certain risks and make their work more efficient. Interviewee A wanted to add that improvement processes are discussed during monthly meetings. Interviewee C is currently not taking part in any development processes.

Interviewee D explains that all team members bring up issues to improve the way of working. This mostly happens during Logistics department meetings or when the whole supply management department has quarterly meetings. Issues are taken into consideration and updated into the Logistics Instructions, brought to fo-

rums like escalation team (for suppliers performance) or for strategic sourcing meetings with suppliers. Additionally, issues are brought up by e-mail and by phone whenever a new situation or demanding situation occurs.

Interviewee D concludes that it is not efficient logistics to keep the number of personnel on a minimum level since logistics/forwarding/informative work is generally related to a high workload and the amount of work to be done can seldom be foreseen. Also, work load peaks and downs are very difficult to cope with in the project oriented operations since involvement and knowledge about the project needs to be at an up-to-date level. Mistakes and miscommunication that easily take place under pressed time schedules without back up personnel can result in losses while covering up in order to catch vessels / reduce or prevent major financial losses. Since logistics is at the end of the process where non-expected issues surface and can be costly to sort out.

6.5.5 Logistics Processes, Activities and People Development

Five questions relating to logistics activities and processes as well as people development was asked from the interviewees. The first question was how external partners and service providers are involved in the logistics activities.

According to interviewee A some certain suppliers and service providers have agreed upon certain contracts, for instance, a packing company is taking care of packaging dangerous goods and related declarations. Interviewee B mentions that the service providers are very important actors in the context of logistics. Interviewee B adds that the department would not manage without their services. Examples of what service providers do for the department is to take care of collection of materials, temporary storage, special packaging, loading surveys and so on. Interviewee C commented that the logistics department has many service providers such as forwarders and trucking companies. Interviewee C explained that the new logistics software which has been taken into use is developed in close cooperation with both external and internal partners. Interviewee D says that service providers and external partners are involved mostly by undertaking special dedicated project work. The port operators mark materials as arrived, take care of stor-

age, amend goods external documentation outside the parcels and prepare goods prior to loading, export clear and load the goods if the loading belongs to Wärtsilä's scope under the transport contract. In case needed, the port operators arrange containerization of goods. Forwarders take partial responsibility from port to port or from a port up to a final destination. For this they contract some representatives to cover all work knowledge and steps needed. Forwarders are involved quite early in the project planning and may have a great impact on enabling the best set-up what comes to the packing of goods, depending on whether the solution to the destination is container vessel or not.

The interviewees were asked if there are any supply management and logistics activities which are outsourced to external partners. If there are such activities they were asked to explain the process and interactions. Interviewee A mentioned that the new logistic software which the department is utilizing has been developed together with a Finnish company. The software is also maintained and updated by the same company. Interviewee B mentioned that collection transport and the rest deliveries are fully outsourced. Interviewee C said that project transport, deliveries as well as rest deliveries are outsourced to a forwarder suitable for the purpose. Interviewee C wanted to add that normal interaction takes place via mail and phone conversations, despite the fact that the involved parties have access to Wärtsilä's systems such as Logwis and Lib. Interviewee D did not want to take any standpoint on this question.

The interviewees were asked how the logistics process and system changes are implemented, communicated and monitored. Interviewee A explained that before any particular changes occur, the changes have always been informed some months in advance. Due to the new implementations, Wärtsilä Power Plants arranges related trainings to keep everyone up to date. Interviewee B was of the same opinion. Interviewee C commented that process and system changes are introduced in department meetings together with training sessions and workshops. Interviewee D mentioned that smaller daily changes are agreed with superior or with colleagues in department meetings.

A follow-up question inquiring in what ways the logistic personnel gets information or follow developments within the area of project logistics was asked. Interviewee B explained that it is pretty hard not to hear and know what is ongoing within their field of work. Interviewee B stated that there is the opportunity to subscribe to different newsletters regarding the field of logistics as well as other fields. Interviewee B further explained that they get information from suppliers and project teams and from service providers about what is going on. Interviewee C said that such information can be communicated during meetings or training sessions organized by superiors or by other team members. Interviewee D was of the opinion that daily contact with suppliers takes place via e-mail and telephone conversation as well as via the department meetings. Interviewee D mentioned that to some extent the information sessions and the Intranet are communication channels since these channels are more for the whole Power Plant division.

"How is people development and training arranged in your department" was the topic of the next question. Interviewee D says that trainings and development are discussed during development discussions and the training plan is set up on yearly basis. Interviewee D mentioned that learning by doing with an active attitude for applies. To this question Interviewee B deliberated that as a logistic coordinator you are obligated to have and attend to certain training courses or sessions. If there is extra time, the employees can attend job related trainings. However, due to saving programs, it is very hard to participate in non-obligated courses at the moment. Interviewee B explained about the importance of site to suppliers, port operators and other external partner. Interviewee A explained that service providers and other external partners keep them up-to-date about upcoming changes, for example, legislative changes. Interviewee C was of the same opinion as Interviewees A and B that training is achieved via workshops in different subjects. Interviewee C commented that there is a wide selection of e-training sessions, of which some are mandatory and some are not.

6.5.6 Logistics and Customer Interactions

To end the interviews, three questions related to customer communication as well as suppliers and superior feedback were asked. The first question asked from the interviewees was it they personally communicate logistics-related issues with customers. If they are communicating such matter with customers, they were asked to explain how the matters are discussed and, if not, who is communicating logistics issues with the customer.

Interviewee A answered to this question by saying that as a logistic coordinator it is not part of your work description to discuss issues directly with customers and, therefore, it is avoided unless the project teams ask you to do so. Interviewee A continues with saying that they have certain persons for dealing with customers, for instance the project manager for a project or other members from the team. In interviewee B´s experience projects where Wärtsilä is not responsible for the transport, for instance in FOB projects, the logistics coordinators communicate with the customers' logistics people. Interviewee B was of the same opinion as interviewee A that in projects where Wärtsilä is responsible for the transport and logistics, the project team or manager discusses the needed issues with the customers and provides the logistic coordinator with the information on what was reached. Interviewee C commented the same as interviewees A and B but added that pre-shipment inspections need to be organized with the customer as well as other issues concerning the daily work. These include, for instance, special packing arrangements, photos of equipment and so on. From interviewee D's point of view, communication with the customer is mainly handled through the project team. Interviewee D says that the main idea is that the project team with its manager should take care of the discussions with the customers.

The interviewees were asked if they are aware of customer expectations regarding project deliveries. Interviewee D says that expectations are based only on the expectations set in Sales kick-off meeting. Interviewee B commented that in the projects in which they are responsible for the transport to the site, the primary expectation is getting the materials on time. Interviewee B continues with saying that

Wärtsilä tries to ensure that they get the materials on time and according to the contract made. Interviewee A said that the awareness is seldom there, but it can easily be interpreted by how the project teams are communicating logistic related issues. Interviewee C answered briefly that it is up to the project teams to communicate with customers. Thereafter the project team decides if they communicate the outcome of the customer discussion to the logistics department.

The final question which was asked from the interviewees was if they get any feedback on their performance from superiors, suppliers and/or customers? Regarding the feedback from superiors both interviewees A and B agreed that not enough feedback is received from superiors, or at least not as much as they would like to have. Regarding feedback from suppliers, interviewee B said that if you have a good relation to them you get feedback, while interviewee A said that feedback comes almost on a daily basis. All interviewee agreed that if you get feedback from customers, the feedback comes via the project teams. Interviewee C said that positive feedback is rarely received. Interviewee D was of the opinion that you might get feedback about the project handling performance from superiors and, if you are lucky, from the project teams and via CROL, Customer Relationship On-Line.

7 RESULTS AND CONCLUSIONS

7.1 Logistics Strategies and Competitive Advantage

Based on the interviews which were conducted with the representatives of the logistics department of the case company, the only strategy which seems to apply for the entire logistics department is; just on time delivery of the material which is being collected for the projects. Another conclusion which could be drawn based on the interviews is that the logistics strategies are generally not be made for the entire department, rather the strategies are based on the project and what type of scope the project has. Shipment plans should be done and be the primary source of information concerning logistics. In my opinion the shipment plans are to be done in close cooperation with all internal stakeholders of a project.

It can be concluded that the Wärtsilä corporate strategy related to logistics focuses on delivering quality material to customers within the contractual terms and time. The projects which are awarded to the case company are getting more complex and more demanding. Constant adaptation of strategy should be possible.

When the interviewees were asked about their opinions concerning logistics competitive advantage over competitors it was not possible to draw any concrete conclusion due to lack of experience with other companies and lack of intelligence of competitors. Positive feedback has in some cases been received from the customers who have bought equipment with FOB as a delivery term. The feedback has stated that the logistic department and people from Wärtsilä have been very competent and their knowledge and know-how has been broader than that of competitors in the same industry. When the interviewees were asked about factors which differentiate the logistics work and performance from that of competitors, 75% of the interviewees did not want to take any standpoint due to lack of knowledge about competitors and their way of working regarding logistic and supply chain activities.

7.2 Targets, Objectives and KPIs in Logistics

Based on the interviews, the conclusions on logistics department's targets, objectives and key performance indicators can be divided into various categories. The primary target of the department is to have the goods at the right place, at the right time, and, of course, at optimal cost. Delivering a certain amount of cargo every quarter was indicated to be among the targets of the department. Among the objectives of the department the primary one seems to be supporting the projects teams in being successful with their projects. The second objective is to make efficient and cost effective logistic arrangements in order to ensure the success of the projects. What could be concluded from the interviews was that the objective can be assured by securing on-time delivery of the project material.

What can be concluded from measuring and following up of targets and objectives is that statistics on, for instance, modes of delivery which have been used and the amount of delivered cargo and comparing it with previous year's results are used. The progress of project deliveries can be followed with the department's logistics software; it can be measured by power plant projects entering the commissioning phase. The conclusion which can be drawn by key performance indicators is that either the logistics department has none or that among there interviewees there is lack of knowledge and information. Another conclusion which could be drawn based on the interviews is that costs are not clearly defined and monitored by the logistics department. The costs are controlled for each project by the project manager and the project controller. The operative purchasing department and the transport department on the other hand have their own ways of monitoring their costs and performance. It can be recommended that the people in the logistics department become more involved in the follow-up of their performance and related costs.

7.3 Improvements and Changes

From the questions concerning logistics and external partners, a few conclusions can be made. Some immediate organizational changes could be implemented within the logistics department in order to improve the overall logistics manage-

ment and efficiency. It can be concluded that the current workload does not fully allow improvements within the department. It appears that the workload could be adjusted by omitting the geographical areas, in which the logistic coordinators are currently divided into. The workload among the areas is never equal. Since the department has recently taken a new logistic software into use, this seems to be a valid improvement idea, because the software is a crucial addition into the toolbox of the department. As previously mentioned, the projects are becoming larger and more complex. This is gives a reason for getting the software up to its fullest potential.

7.4 Logistics Processes, Activities and People Development

There are several conclusions that can be made regarding external partners and services providers and their roles within the case company. Based on the interviews frame agreements with the most frequent suppliers and services providers have shown to be a very successful way of conducting logistic related work. It can be concluded that the logistics department is heavily dependent on external partners and service providers. The new logistics software, Logwis, which is now being utilized in the case company has been developed in close cooperation with internal partners, external partners and service providers. The software will be used for organizing the goods from suppliers to the final destinations at site. The software will be used by several parties involved in the logistics chain such as suppliers, module manufacturers, transport companies, port operators, forwarders, carriers and finally the logistic staff at the sites.

Based on the interviews the upcoming changes seem to be properly communicated both on the management level and on the department level. There seem to be sufficient communication channels for communicating news, changes and other developments within the case company. From the interviews another conclusion is that the case company has the possibility to arrange workshops and training occasions when major changes are taking place. A conclusion which could be drawn regarding the information flow of developments within the area of project logistics is that the employees of the department are sufficiently provided with the lat-

est news, from internal sources, suppliers but more importantly from service providers. Based on the interviews the employees who had good relations with service providers and suppliers got the latest news.

7.5 Logistics and Customer Interactions

Based on the facts received in the interviews the logistic department is a support function to the project management organization and is for that reason not part of the core project team. A conclusion which can be drawn is that the logistic coordinators are not exposed to direct customer contact on regular cases. One reason is to minimize the point of contact to the customers. My opinion is that allowing the project manager or team members to have the contacts with the customers is a good way of working as long as there is sufficient communication and information flow between the logistics team members and the project teams.

Based on the interviews the end-customer expectations were not fully clear for the logistics staff. One possible conclusion is that there is a need for more communication about the customer expectations in the logistics department, other than delivering correct materials on time and according to the shipment plans.

The subject of the final question was to feedback received from superiors, suppliers and/or customers. The overall comment was that the interviewees do not receive enough feedback from their superiors, or at least not as much as they would want. Most of the interviewees receive feedback from the suppliers. All interviewees agreed that if they receive feedback it comes via the project teams as they have more direct interfaces to the customers. All interviewees expressed the wish to obtain more feedback; both positive and negative.

7.6 Conclusions and Findings of the Thesis

In the initial chapter 1.2, the aim of this thesis was introduced and the main research problem was described as “to clarify and identify what supply chain and the logistics is, and more importantly – how can modern logistics models and strategies be utilized in order to bring added value and profitability to a project oriented company”.

Specific literature related to performance improvement, supply chain management and logistics was used in order to describe the topic from a theoretical point of view. Based on interviews with the employees working with logistics in the case company, Wärtsilä Finland Oy Power Plants, and partly on my practical knowledge about the topic, how cost effective and efficient logistics can be beneficial for project-based companies has be analyzed as well as how outbound logistic strategies can be implemented and further improved to achieve notable results.

It has been concluded that specific efficiency improvement methods based on the SRAM decision-making model, the EFQM-method for Self Assessment and the Kaizen approach can be applied and introduced for performance improvement in the supply and logistics activities.

The main results from the case company study and from the interviews with the logistics people can be summarized as:

- The case company can be considered as advanced and specialized in project management and in related logistics activities and processes. In addition to the company-ERP system, specific information management tools/software has been implemented to support the various activities.
- The main objectives are clear for all the persons interviewed in the case company"fast delivery and guaranteed delivery time" and "no delays in the shipments and deliveries". It can be noted that there seems to be a lack of connection or link between corporate strategy and the logistics strategy.
- There seems to be a need to improve the communication of performance management and related KPIs, since a certain lack of knowledge related to KPIs and measures used was noted. The logistics staff are not involved on a daily basis in cost controlling and follow-up against agreements and cost plans.
- A clear finding from the interviews is the need for regular feedback from superiors, suppliers and customers. With a good process for collecting and using the feedback received – both positive and negative – the company

can develop the people and the way-of-working in order to achieve better performance and added value.

Based on the theoretical framework and the empirical study, some areas of development was found that is likely to be valid for most companies working especially in a project business environment.

In order to improve the performance – both process performance and financial performance – it is proposed that companies establish clear market-focused strategies for their supply chain and logistics functions. The strategies should be clearly communicated to all parties involved and there should be a target to obtain an understanding and a buy-in of the strategy message. These strategies should include clear purpose statements and measurements/KPIs for:

- Customer focus
- Competitor insights
- Business partnerships
- Competence development

Companies with market-focused strategies tend to have strong international orientation with strong brands and strive for innovation and market shaping. A shared vision is important. The individual accountability combined with strong financial management and control is vital. The following areas need to be developed:

- Improving planning and budgeting, including analysis of planned and actual logistics performance; both the company's own performance and performance of the logistics providers.
- Improve efficiency and internal collaboration, including complete tracking, monitoring and follow-up of logistics activities; further develop current software (such as Logwis in the case company).
- Improving margin visibility, including monitoring of all logistics-related expenses, both on company and on individual project level.
- Improve measurement and control. It is proposed that clear KPIs are developed for the following areas: delivery accuracy (on time) and lead

times, cost focus; expenses of own logistics function and external services, customer feedback (external and internal), working capital focus and delivery-to-cash monitoring.

- Collecting more focused feedback from all stakeholders. Based on the feedback, performance improvement and/or change management initiatives can be implemented.

As part of the proposed development areas, there is a need for optimization of the current systems and processes. New technologies and systems need to be scanned in order to be "on top as leaders" in market-focused environment. Stronger focus and monitoring of policies and process descriptions is required.

Performance improvement and related measurement is a process of feedback, and feedback has a fundamental role in resulting into a "learning organization". It is recommended that companies integrate some of the strategies associated with a learning organization, such as shifting mental models, developing a shared vision, encouraging team learning, developing skills to see the wider picture as well as details, looking for patterns and root causes. In order to improve the performance and related financial results, companies should allow time and space to really learn from feedback collected; especially from feedback related to successes.

It is recommended that companies use different methods and tools in order to improve decision-making, performance and efficiency. In the theoretical part of the thesis SRAM, a decision-making model, the EFQM method for Self Assessment and the Kaizen approach were analyzed. These models and methods could be developed and used for enforcing the disciplines efficiently in the everyday-work on every level of the organization. The ultimate objective of performance improvement is to create long-lasting added value for all stakeholders of the company. The recommendation is that the four disciplines of "good management" are implemented in order to enhance added customer/stakeholders value as follows:

- Connect strategy, goals and related measurement and follow-up.
- Understand customer requirements and deliver value efficiently to the customer; request and analyze feedback.

- Enable people to develop, lead and contribute to their fullest potential.
- Implement continuous exploration of new technologies and better ways of working; by becoming a learning organization.

7.7 Proposal for further research

As earlier described supply chain management is becoming more important today than ever before, The impact of an efficient supply chain and logistics function is increasingly prominent; not only in terms of financial (cost) impact, but in terms of value creation.

During the last years important research has been performed in relation to supply chain management. Nevertheless, there is still room for further research regarding the following areas:

- Definition and implementation of strategies for the supply chain and related activities
- Identification of key enablers and obstacles for implementation of an efficient supply chain organization
- Competitive advantage of entire supply chain process

7.8 Metodhology discussion

The research provided good insight and several learning points concerning improved profitability and competitive advantage by implementing efficient supply chain and logistics management in a project-based company. Qualitative interviews can be considered a suitable data collecting method for this type research, since it can concluded that the questions related to the problem area have been answered. In order to get more comprehensive insight into the subject, interviews could have been conducted with more employees who have different roles within in the supply chain. Interviews could have also been conducted with external partners and service providers to get broader insight into to the subject. It could have been of interest to compare differences and similarities in the supply chain management of the various divisions of the case company. Bench-marking with

other companies in the same industry and/or with companies in project business could have added more comparison data and facts to the research area.

Concerning the outcome of this study, it seems that the primary goals and objectives of the study were reached. Regarding the quality and outcome of the study, the level of satisfaction is rather high. Conducting research within the studied field has provided a broad insight into the importance of supply chain management and logistics.

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APPENDIX 1

PROFITABILITY IMPROVEMENT FROM EFFICIEN SUPPLY CHAIN MANAGEMENT IN A PROJECT-BASED COMPANY

Interview questionnaire

The purpose of this thesis and the main research problem is to clarify and identify what supply chain and the logistics is, and more importantly – how can modern logistics models and strategies be utilized in order to bring added value and profitability to a project oriented company.

The final question, to which this research tries to find an answer, is: "What is still needed to be done, and how could the outbound logistic strategies be implemented and further improved to achieve notable results in a project-based organization?" This question can be considered as twofold: 1) To provide an organization with necessary tools to reach and maintain excellence; 2) To effect continual improvement

1. Explain the different roles within the department. What is your role and responsibilities?

2. What are your primary logistics strategies? and how are they accomplished / followed
3. What are the primary corporate strategies and can they be related to your logistics function?
4. How would you define your logistics competitive advantages compared to your competitors?
5. What factors, in your opinion, differs your work and performance compared to the competitors?

6. What kind of targets and main objectives does your department have?
7. How are the activities and targets measured and followed-up?
8. What kind of Key Performance Indicators or measures are used and monitored within your department?
9. Do you use any Key Performance Indicators in the improvement process? If yes, please explain how.
10. How are logistics costs defined and monitored?

11. How do you identify and prioritize opportunities for improvement within your logistics department? Why?
12. Are you – personally – involved in performance improvement activities within your department? If yes, please explain the improvement process.

13. How are external partners and/or service providers involved in the logistics activities?
14. Are any supply management and logistics activities outsourced to external partners? If yes, please explain the process and interactions.
15. How are logistics process and system changes implemented, communicated and monitored?
16. In what way do you get information or follow developments within the area of project logistics?
17. How is people development and training arranged in your department?

18. Do you communicate logistics-related issues with your customers? If yes, please explain how. If not, who is communicating logistics issues with the customer?
19. Are you aware of customer expectations regarding project deliveries?
20. Do you get any feedback on your performance from superiors, suppliers and/or customers?