



# **Master's degree thesis**

**LOG950 Logistics**

**Coordination Between Different Value Chains  
-- A Case Study of Ulstein Elektro**

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Number of pages included the first page: 103

Molde, 2009



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**Subject code: LOG 950**

**ECTS credits: 30**

**Year: 2009**

**Supervisor: Bjørn Guvåg**

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## **Preface**

This paper is the Master Thesis of Weiwei Tian, student at Molde University College, Norway. The Master Thesis is an obligatory research work for my Master degree titled Master of Science in Logistics.

The research topic has been executed under the guidance of supervisor Bjørn Guvåg. The primary focus of this research is to coordinate between different value chains, especially into supplier relationship, see if it is possible to use the same supplier at network for Ulstein Elektro (UEL) in Norway and Ulstein Marine Equipment Ningbo (UME) in China. During the period of writing this paper, my supervisor had been a source of huge support and encouragement for me. I am allegiant grateful to my honorable supervisor Bjørn Guvåg for his relentless help and share his academic expertise in his domains.

I would like to thank Hanne Reite, logistic manager of Ulstein Elektro, for giving me the opportunity to learn about practical life in coordination problem of UEL and UME. During meeting and email communication I got insights and information about how processes are conducted.

I would also like to express my heartiest gratitude to Eivin Sæther, the Managing Director of Ulstein Marine Equipment Ningbo, for providing me with valuable information and answering the survey questioner. During the meeting in China, I get a thorough know about the new company UME, and realize its activities in the Chinese market and linkages with UEL.

Molde, May 2009

Weiwei Tian

## Summary

China has, and has had, powerful growth. The country is developing fast and is greatly committed to building up its infrastructure. China has advantage to produce low-end products with low technology level, mass production, high volume and high weight. In addition, base on its advantageous geographic locations, China gradually becomes the logistic center all over the world since it possesses of many large ports, airline routes, railway routes and shipping routes among all important cities. It can transport products in time in anywhere in the world. Depends on these favorable elements, Ulstein Marine Equipment Ningbo (UME) was established in China at 2007. It applies cost leadership strategy and lean supply chain to produce low-end products in the low-end market. Further UME is directly linked to Ulstein Elektro (UEL) in Norway and help UEL to produce low-end products. However, UEL produces high-end products in high-end market, and hence it applies agile supply chain and differentiation strategy in order to meet different customer's needs.

This research work investigates how to coordinate different value chains between UEL and UME. It has tangible and intangible interrelationship and coordination will cause coordination cost, compromise cost and inflexibility cost. Because two different companies have different supplier selection criteria and supplier portfolio management, this thesis will focus on coordination especially into supplier relationships. The theoretical framework of the paper also introduced transaction cost analysis and resource dependence theory. UEL tries to find some suitable suppliers in China due to the lower purchasing cost. But while UEL turns its steps to Chinese market, it will break the relationship with current suppliers in Norway and cause some compromise cost as well. Therefore the research question arises here if it is possible to use the same supplier at network for UEL and UME. According to the theories presentation, analysis and discussion, some suggestions will be given enclosing the primary research question for the company.

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## **1. INTRODUCTION**

The industry of shipbuilding has been developing all over the world based on higher market demand for different types of vessels. Ulstein Group has solid knowledge of control systems for advanced vessels in the industrial market. Ulstein Elektro (UEL) is actively working with development of products and systems at sea and shore-based installations from its head office at Ulsteinvik, Norway and a branch office Ulstein Marine Equipment (Ningbo) Co. Ltd (UME) located in Ningbo, China. The company UME will offer design- and engineering coordination to pursue accurate and effective production of products from UEL. On the other side, two different companies, UEL and UME, have their own independent management and operational method. In addition, they produce different kinds of products, serve different markets, possess of different suppliers and supplier relationships and so on. Hence, the consequence is that UEL and UME have two different value chains.

The research work will investigate the characteristics of the procurement in value chains of two different companies. Further to explore and analysis the subject of this paper, how to coordinate two different value chains of UEL and UME. The primary focus should be on procurement of electronic components such as starters and breakers provided both on the Norwegian market and Chinese market. Since UEL and UME have different supplier selection criteria and various buyer-supplier relationships, the coordination between different value chains should especially aim into supplier relationship, and to explore the most important issue in this paper if it is possible to use the same supplier at network for both companies. The theoretical background of the coordination theory, transaction cost analysis and resource dependence theory are also introduced and combined with the empirical part in order to find out what kinds impacts the theoretical part has in reality. And then some discussion will be done in order to see whether there is any thing to improve the current situation. Finally, some useful recommendations will be advised to the company UEL that can lead to an optimal solution.

## **2. RESEARCH BACKGROUND**

### **2.1 Company Background**

The companies in the Ulstien Group are gathered under the holding company Ulstein Mekaniske Verksted Holding ASA which, in addition to functioning as a holding company, also has the primary objective of business development across the business structure. Ulstein Mekaniske Verksted Holding ASA (UMVH ASA) began operations on the 4th of May 1999. The company evolved from Ulstein Mekaniske Verksted which was established in 1917. UMHV ASA is the parent company of an industrial and shipping group which consists of operating companies in ship design, shipbuilding, electrical & control systems, property companies that own buildings and facilities, and companies with ownership shares in ships. The Ulstein Group has approximately 700 employees nowadays.

There are three subsidiary companies in Ulstein Group located in Ulsteinvik. Ulstein Verft AS is one of the world's foremost suppliers of advanced vessels. Ulstein Design AS develops vessels that satisfy customers' demands and future needs, and functions as a liaison between shipping companies, shipyards and equipment suppliers. The last and the most important subsidiary company will be introduced in this research paper, Ulstein Elektro AS, supplies products, system solutions and services for the marine and the industrial markets, which includes system solutions for electronics, automation and power control. Ulstien Elektro carries out electrical installation and installs marine electronics on board ships. In addition, Ulstein Elektro is one of the biggest suppliers, which provides most electrical installation and equipments to her sister company Ulstein Design.

### **2.2 Products introduction**

Ulstein Elektro (UEL) produces four mainly products, Ulstien Infotainment & Communication System (Ulstein COM), Ulstien Bridge Alarm System, Ulstien Power Control and Ulstein Integrated Automation System (Ulstein IAS).

**Ulstien COM** is an integrated communication system for installation aboard ships. The system receives signals form computers, television, radio, monitoring cameras and other sources and distributes them to relevant parts of the vessel. Ulstein COM integrates different systems in a unique way, gathering signals from different sources into a single cabinet before distributing them through cables to monitors throughout the ship.

**Ulstein Bridge Alarm System** provides visual and audible indication of alarms. All equipment on the bridge making an audible alarm shall be connected to the Bridge Alarm System. Alarm transfer to specific locations outside the bridge to alert and call the master and back-up navigators, automatically initiated in case the bridge alarms are not attended to or an operator disability is detected.

**Ulstein Power Control** is the intelligent selection of transmit power in a communication system to achieve good performance within the system. The notion of “good performance” may include optimizing metrics such as network capacity, geographic coverage and range, and life of the network and network devices.

**Ulstein IAS** is a system that controls and monitors various processes and operations that take place aboard a vessel. The system is capable to handle huge amounts of data at high speed. Further, there are several integration possibilities for an automation system with the other systems. For example, Ulstein IAS can easily be integrated with Ulstein COM to establish two-way communication allowing the vessel’s functions to be monitored from shore.

Ulstein Elektro’s activity is primarily directed towards industry, business premises and administrative organizations at national and local level, where the company is a total supplier of electrical, low voltage and automation systems.

### **2.3 Business development in China**

With the rapid development of the Ulstien Group, it tries to expand its sub-companies and offices into foreign countries. China has, and has had, powerful growth. The country is developing fast and is greatly committed to building up its infrastructure. China has the world’s third-largest shipbuilding industry and aims to top the category in the future. In November 2004, Ulstein China representative office was established in Shanghai. It aims to build and develop a tight network with the company’s Chinese connections. The main focus has always been on marketing and selling Ulstein’s products in the country, along with following up projects under construction. In addition, it contributes to offer engineering capacities, especially on coordination on engineering and design to shipbuilding projects for Ulstein’s ship design activities in China.

Ulstein China also has a separate department at the Ningbo shipyard that provides general yard support, organization and the coordination of equipment deliveries. Ulstein Marine Equipment (Ningbo) Co., LTD. (UME) was established as a WOFE (Wholly Owned Foreign Enterprise) company in April 2007. The company is directly linked to Ulstein Elektro (UEL) in Norway and it is a part of Ulstein group. UME is in the set-up phase in Ningbo, China. It will offer design and engineering coordination to pursue accurate and effective production of products from UEL. In July 2008, production of first products took place in UME, which focuses on producing Ulstein Local starters and motor control cabinets (MCC). An MCC consists of sixteen starters that are installed in a cabinet, the starters control pumps and fans on the vessel.

UME has gradually grown under the situation of itself continual developing and UEL's collaboration, hence it increases efficiency and productivity has been greatly improved as well. For example, improvements have been resulted in optimization of the MCC cabinet production processes, which in turn has reduced the manufacturing time per MCC. In addition, UME is continually finding and exploring new suppliers, who will provide qualified electronic component at lower price. Therefore, managers of Ulstein Group strongly believe that UME will help ensure UEL's competitive strength and development in the coming years. A good coordination and collaboration between two different companies will lead to great benefit for further development.

### 3. RESEARCH PROBLEM

Ulstein Elektro (UEL) is an industrial production company, with the main focus on the supplies products, system solutions and services for the marine and the industrial markets. In addition, UEL has own logistic department, administrative department, engineering department etc. Being mainly a production company, UEL has relations to several suppliers and customers, and dependent on a well-functioning supply chain with good relationships both upstream and downstream. UEL has its own production lines which focus on producing high-end electronic products provided in the high-end market. Hence, differentiation strategy applied by UEL in order to satisfy various customers' requirements.

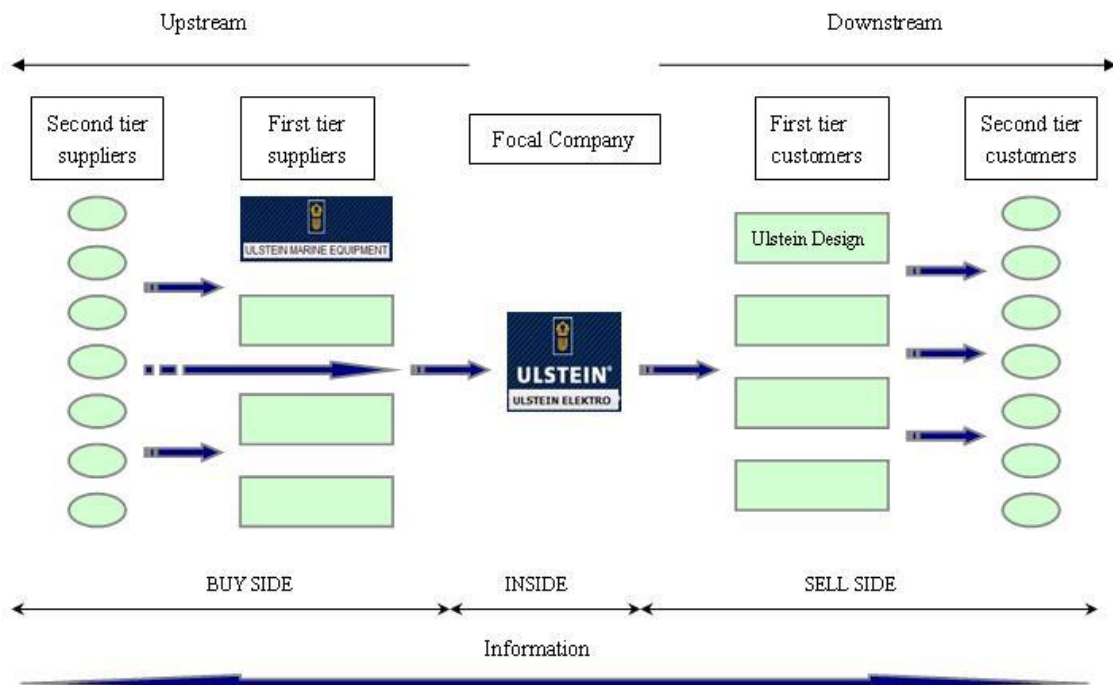


Figure 1: Illustration of the Supply Chain network Structure of UEL

On the other hand, UEL will purchase other kinds of products from its suppliers. Ulstein Marine Equipment (Ningbo) Co., LTD (UME), directly linked to UEL, is one of the suppliers of UEL, which focuses on producing low-technology products provided in the low-end market. The competitive strategy of cost leadership is applied by UME, since it is a cost effective company. Being a new established company, UME continually produces ulstein local starters and motor control cabinets (MCC), which ordered by UEL and other customers. Moreover, UME is also a self-governed company with logistics department, engineering department, and financial department and so on.

As seen the figure 1, a focal company UEL is shown at the center. Tier 1 comprises UME and other suppliers deliver raw materials and electrical components directly to UEL, while tier 2 suppliers deliver to the tier 1s, meanwhile some tier 2 suppliers provide electrical products directly to UEL as well (it is represented by the long arrow in the Figure 1). On the demand side, UEL provides its high technology products to Ulstein Design as tier 1 customers, who in turn supply to other customers as tier 2, and so on.

With the technology development and productivity improvement of UME, more and more projects and negotiations have been implemented between UEL and UME. For example, 50% of all UEL products shall be produced at UME within the strategy period, 4 out of 10 UEL equipment packages (which are in the budget) shall be made by UME, half of all starter and MCC orders for UEL shall be made by UME. In addition, different kinds of electronic products will be gradually produced by UME, such as T56 cabinet, shore connection cabinet, ulstein bridge alarm system (UBAS), 220V switchboard, and main switchboard etc. Gradually UEL is transferring more production of low-end products to Ningbo factory. Hence more materials and electronic components should be purchased from different suppliers by UME, and the firm must pay more attention to purchasing performance. Therefore UME might have great potential of improving their purchasing performance through implementing strategies towards different suppliers.

On the other side, UEL is aware of purchasing represents an important part of its company's total business, and influence the total costs significantly as well. With the globalization, most of manufacturers have quickly developed in the all over the world, and they have a 'global deal'. At the same time, UEL has already realized that purchasing these electric components such as starters, breakers and switches in Chinese market is much cheaper than buying them in Norway. High cost saving tempts UEL to turn its procurement into Chinese market. An idea is suddenly come forth: base on insuring quality if it is possible for UEL to purchase electric components in Chinese market, further whether it is possible for UEL to use the same supplier with UME. Therefore, the idea becomes the primary research problem in this paper.

According to van Weele (2005), the purchasing function traditionally encompasses the process of buying. This buying process involves determining product specification, supplier selection, contracting, ordering, expediting, follow-up and evaluation to ensure

proper delivery. That is, the management function in purchasing is to “all activities necessary to manage supplier relationships” (van Weele, 2005, p.15). In accordance with the classification of buying process, there are obviously two distinct purchasing functions of UEL and UME associated with their different value chains. UEL produces high-end electronic components and marine equipments, which aim to sell in high-end market such as Scandinavia countries, and developed European countries. However, UME sells products towards low-end market. Correspondingly, UEL has agile supply chain because it produces high quality and technology products. UME has lean supply chain in respect that it produces standard products. Except these features, UEL and UME have following different characteristics, background, location, organization form and purchasing/supplier strategies and so on. Research questions can be addressed here to help UEL to solve these problems of ‘difference’ in order to achieve the main purpose in this paper.

- Overview two different value chains of UEL and UME.
- Is it possible to coordinate them?
- How to coordinate two different value chains especially focus on supplier relationship into purchasing strategies?
  - What are purchasing strategies for UEL and UME?
  - What are the supplier selection criteria? Are they same for both companies?
  - Is it possible for UEL to purchase electric components in Chinese market?

To constrict the field of research, this thesis will be focused on the purchasing of electrical components, and hence the range of supplier selection should be reduced correspondingly. Nowadays, UEL has 330 suppliers and UME has fewer, but in this research paper, the highlight should be put on those suppliers provide electrical materials and components. For example, Schneider Electric and Phoenix Contact are global manufacturers that supply starters and breakers mainly used for ulstein switchboards, and switches will be provided by Moxa. All of these electrical components, starters, breakers and switches, can be considered as leverage products, since there are many alternative suppliers which provide such kinds of products. And then the development of purchasing strategies towards these suppliers will also be introduced in this paper. In addition, these electrical products are the basic components for producing Ulstein four categories of main products, Ulstein COM, Ulstein Bridge Alarm System, Ulstein Power Control and Ulstein IAS. However,



purchasing of such products involves significant costs and time used by the purchasing department.

Two companies, UEL and UME, now are discussing a serious problem whether more raw materials can be purchased by UME from the supplier in China and then export to UEL. Hence the considerable research problem has returned back to the main idea in this paper:

- Is it possible to use the same suppliers at network for UEL and UME?

These questions put focus on the importance of the value chain coordination, and primarily concentrate on supplier-relationship into purchasing strategies. And how to answer these questions can help both companies to improve the purchasing function, and further to enhance companies' overall performance. This focus leads us to the subject for this thesis: coordination between different value chains, especially into supplier relationship: see if it is possible to use the same supplier at network for both companies.

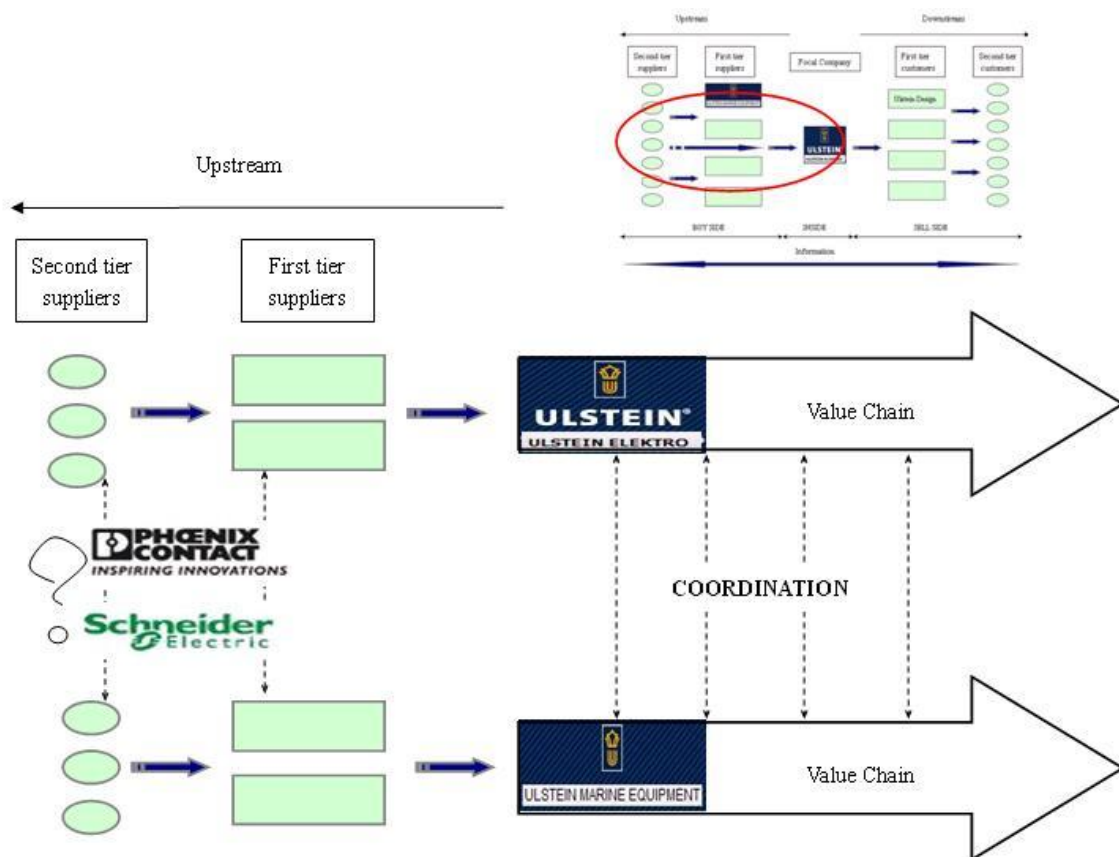


Figure 2: Unit of Analysis

As stated above, the field of procurement is an important part of value chain and a significant component in successful business. Hence, the spotlight in this research paper will further focus on the two different companies UEL and UME. Figure 2 illustrates the field of analysis of a coordination strategy between both two different firms with joint suppliers and different value chains of both companies. Since UEL and UME are two independent companies and have different value chains, they should further outspread the coordination process especially into supplier relationship, and hence some benefits and disadvantages will be caused simultaneously. The question mark shown in the Figure 2 generates the central problem in this paper: if it is possible to use the same suppliers, such as Schneider Electric and Phoenix Contact at network for UEL and UME. What are possibilities, problems, benefits and requirements of using the same suppliers?

Because the geographic, administrative, executive factors are different of UEL and UME, they have own value chain, buying process, and strategy etc. However, they are suggested to buy same kind of electrical components like electrical starters, breakers and switches needed in the production of ulstein switchboards. The suppliers' selection will be analyzed through the use of different tools, criteria and differentiation of supplier relationships in order to show if the selected suppliers are suitable for both companies.

To conclude, the main research problem in this paper is that coordination between different value chains, especially into supplier relationship, and it mainly focuses on if it is possible to use the same suppliers at network for UEL and UME.

## **4. THEORY REVIEW**

This chapter further elaborates the primary concepts and theories relevant for the research problem and analysis. Identifying and presenting the theories will start off defining and explaining different kinds of supply chain, before describing the concept of the role of purchasing in value chain and correlative competitive strategy. Further the coordination of value chains is described. Moreover, the theory will be constricted, describing supplier selection and purchasing/supplier portfolio management, including Kraljic's portfolio matrix. According to the research problem, the theory of leverage item and its relevant purchasing strategies will be detailed introduced, other items and corresponding strategies just give an integrated picture to the reader. In the last part of the theory, transaction cost analysis and resource dependence theory will be introduced in order to explain specific buyer-supplier relationships.

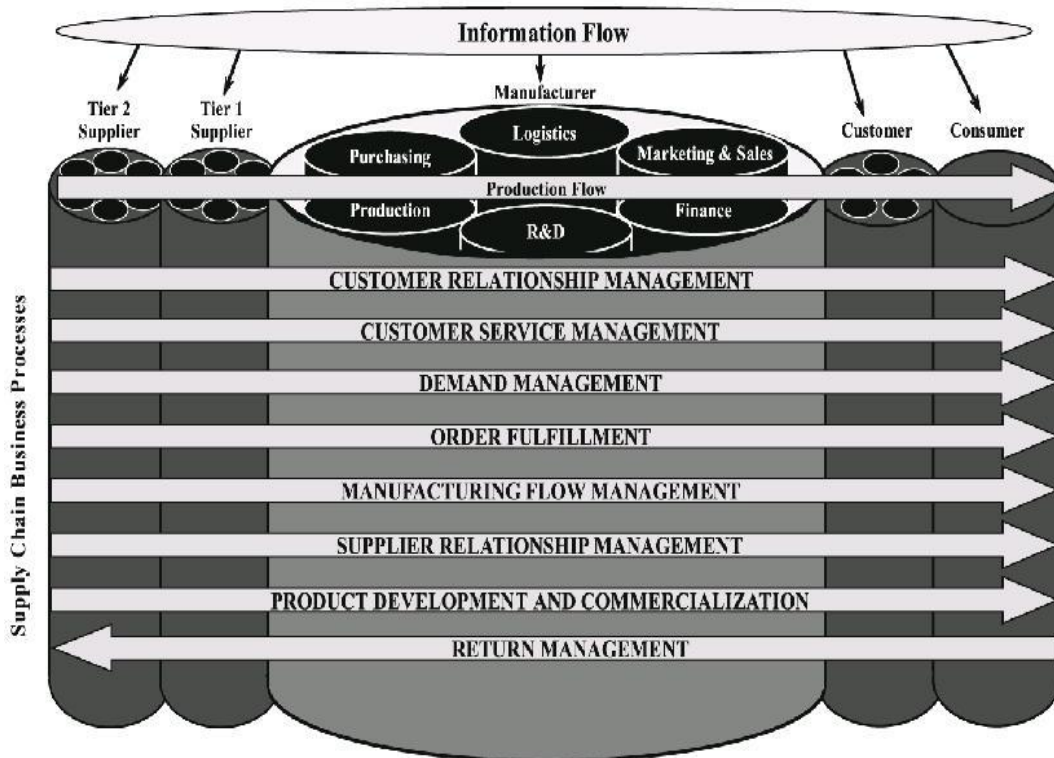
### **4.1 Supply Chain Management**

The definition of supply chain management is presented by Lambert et al. (1998):

*Supply chain management is the integration of key business processes from end user through original suppliers that provides products, services, and information that add value for customers and other stakeholders* (Lambert et al., 1998, p.1).

Lambert et al. (1998) clarify that modern business management is not just focusing on the individual businesses and links, but rather is the linkage of the immediate buyer-seller relationships into a longer series of events. A focal firm's suppliers have their own suppliers, and its direct customers are not the ultimate consumers. "Business management has entered the era of inter-network competition and the ultimate success of a single business will depend on management's ability to integrate the company's intricate network of business relationships" (Lambert et al., 1998, p.1). Lambert et al. (1998) claim that supply chain management represents a new method with regard to manage and integrate all businesses and relationships within the supply chain. However, "the supply chain is not just a chain of business with one-to-one, business-to-business relationships, but a network of multiple businesses and relationships. Supply chain management offers the opportunity to capture the synergy of intra- and inter-company integration and management." (Lambert et al., 1998, p.1) This is supported by Harrison and van Hoek (2005) which claim that supply chain management is concerned with planning and controlling the entire chain of

processes, including raw material purchasing, supply, production, storage, packaging, distribution and transportation to the end-customer. Further, Harrison and van Hoek (2005, p.7) define supply chain management as “planning and controlling all of the processes that link partners in a supply chain together in order to serve needs of the end-customer”. The core concept of a supply chain is that focusing on managing and integrating all the processes of supply chain partners.



*Figure 3: Supply Chain Management: Integrating and Managing Business Processes Across the Supply Chain (Lambert et al., 1998, p.2)*

This is further outlined by Simchi-Levi, Kaminsky and Simchi-Levi (2003) which state that supply chain management is a systems approach to efficiently integrate supplier, manufacturers, warehouses and stores from point-of-origin to point-of-consumption for the purpose of meeting customers’ requirements. Supply chain management takes into consideration every facility, and its object is to be “efficient and cost-effective across the entire system” (Simchi-Levi, Kaminsky and Simchi-Levi, 2003, p.1). Supply chain management emphasizes the importance of coordination and cooperation with key members of the supply chain, both on the supply side and customer side.

The broader understanding of supply chain management is the core mission in each company. Lambert et al. (1998) outlined the definition of supply chain management is one of the many ways of defining them. However, the definition expatiates in the start of this section is the basic foundation of this thesis, and it is most suitable for covering the term supply chain management.

#### **4.1.1 Supply Chain Management and Logistics**

The term logistics has numerous different definitions in academic literature. The distinction between supply chain management and logistics is often unclear, therefore in some cases the term logistics and supply chain management are often used interchangeably. Being clearer, Lambert et al. (1998) claim that logistics management is actually a subset of supply chain management and it can be seen as part of the overall supply chain challenge. As seen in Figure 3, logistics can be considered as a functional area within the focal company, and testifies that logistics is only a part of supply chain management. According to Lambert et al. (1998) the explanation of why the confusion between the terms logistics and supply chain management is probably due to the fact that logistics can be seen as one of the functional ‘silos’ (see Figure 3) within companies, logistics is also a wider concept that deals with the management of material and information flows towards customers and suppliers. This can be supported by Harrison and van Hoek (2005), which state that logistics is one aspect of managing the supply chain, and “the logistics task of managing material flow and information flow is a key part of the overall task of supply chain management” (Harrison and van Hoek, 2005, p.6). Further, Harrison and van Hoek (2005) divide logistics into inbound logistics and outbound logistics. Inbound logistics manage the links between the focal firm and its tier 1 suppliers, while outbound logistics deals with the links between the focal firm and its tier 1 customers. Tier 1 suppliers/customers mean suppliers and customers with direct relations or transactions to the focal company, while tier 2 supplier/customers have immediate linkage with tier 1 suppliers/customers etc.

The explicit definition of the relation between the terms logistics and supply chain management is declared by Lambert et al. (1998):

*Logistics is that part of the supply chain process that plans, implements, and controls the efficient, effective flow and storage of goods, services and related information from the point-of-origin to the point-of-consumption in order to meet customers’ requirements* (Lambert et al., 1998, p.3).

Now it is being clearer about the difference between the terms supply chain management and logistics. Supply chain management refers to manage the entire chain of processes, while logistics is concerned with a vital enabler for supply chain management, which main task of managing material flow and information flow across the supply chain. These definitions of the two terms, and the testified logistics management is one functional part of supply chain management will be the basis in further in this paper.

#### **4.1.2 The Lean Supply Chain vs. the Agile Supply Chain**

The success and failure of supply chains are finally determined in the market place by the end consumer. The supply chain follows a demand-driven, customer-centric model that must respond quickly to rapidly changing customer demands. Similarly, it is important to get the right product, at the correct location, at the right price, at the proper time to the end-customers. This model, in essence, refers to as the lean supply chain.

The lean supply chain extends the concept of lean thinking to the entire supply chain. Harrison and van Hoek (2005) claim that lean approach is focusing on elimination of waste. The principle of minimizing waste “spread from the shop floor to all manufacturing areas and from manufacturing to new product development and supply chain management. The term lean thinking refers to the elimination of waste in all aspects of a business” (Harrison and van Hoek, 2005, p.171). This principle is supported by R. Mason-Jones et al. (2000). They consider that leanness means “developing a value stream to eliminate all waste, including time, and to ensure a level schedule” (R. Mason-Jones et al., 2000, p.4064). Elimination all waste of lean supply chain leads to apply the strategic use of logistics performance in order to lower stocks, further can achieve higher productivity, superior product quality and lower costs. These contribute to the achievement of logistics performance objectives by offering improvements in quality, time and cost.

Harrison and van Hoek (2005) also state that lean supply chain works best under specific environment, such product type likes as commodities, demand is relatively stable and hence predictable, and product variety is low (see Table 1). R. Mason-Jones et al. (2000) give clearer characteristics of commodities, which are standardized products, have relatively long product life cycle and have low demand uncertainty because of the fact they tend to be well-established products with a known consumption pattern. The

characteristics of commodity products are more suited to the lean environment where the supply chain strategy is developed to reduce costs in such an arena.

Distinguishing attributes	Lean Supply	Agile Supply
Typical products	Commodities	Fashion goods
Marketplace demand	Predictable	Volatile
Product variety	Low	High
Product life cycle	Long	Short
Customer drivers	Cost	Availability
Profit margin	Low	High
Dominant costs	Physical costs	Marketability costs
Stockout penalties	Long-term contractual	Immediate and volatile
Purchasing policy	Buy materials	Assign capacity
Information enrichment	Highly desirable	Obligatory
Forecasting mechanism	Algorithmic	Consultative

*Table 1: Comparison of lean supply with agile supply  
(Harrison and van Hoek, 2005, p.188)*

The essence of the lean supply chain is to create flow across the supply chain. Lean manufacturing adopted where there is a stable demand in order to deliver products to the end user quickly and flexibly, which is a quick response to customer demands. Besides, lean supply chain can use its advantages to reduce costs and increase product variety to achieve its main goal.

Based on the lean supply chain, Harrison and van Hoek (2005) give a further approach agile supply chain, which is an essentially practical approach to manage logistics capabilities around individual end-customer's demands. Agility means "using market knowledge and a virtual corporation to exploit profitable opportunities in a volatile marketplace" is presented by R. Mason-Jones et al. (2000, p. 4064). That is agile supply chain has the ability of an organization to respond rapidly of changes in customer demands, in terms of design, variety and volume. A key characteristic of an agile supply chain is flexibility. Through automation, it is enable to achieve rapid change in manufacturing flexibility, and further a greater responsiveness to changes in product design, mix or volume can be approved in order to meet the precise needs of the customer more rapidly. As seen in table 1, the characteristics of fashion products are more suited to the agile

environment such as a short life cycle, the unpredictability of the demand. The challenge faced by the agile supply chain is developed to optimize performance in such an arena.

Consequently, the agile supply chain is concerned with developing logistics capabilities proactively in volatile and unpredictable marketplace in order to respond end-customer's demands rapidly and flexibly, in terms of product design, variety and volume. Therefore, both the definition of lean supply chain and agile supply chain are an essential part of foundation in this paper.

#### **4.2 The Role and Importance of the Term of Purchasing**

Nowadays business context is radically changing and business is becoming more and more competitive. Examples are the rapid development of information technology and computer network, the increasing globalization of customer markets, and the enhance importance of customer services. These changes are causing a competition and revolution in business, which indicate that supply chain management and purchasing are gradually recognized as key business drivers by top managers. According to the definition of the concept supply chain management, many alternative perspectives exist on the concepts purchasing management. In accordance with Kauffman (2002) some professions claim to be in the field of purchasing, others claim to be in procurement, supply management, logistics, materials management etc. Due to the different professional specifications in the field of supply chain management and purchasing, there is no agreement on their definitions and concepts. One definition of purchasing presented by Kauffman (2002) focuses on the process of buying, which illuminates that purchasing is “the process of buying: learning of the need, locating and selecting a supplier, negotiating price and other pertinent terms, and following up to ensure delivery” (Kauffman, 2002, p.46). Another definition presented by Kauffman (2002) encompasses the purchasing function in an organization. Purchasing is “a major function of an organization that is responsible for acquisition of required materials, services and equipment” (Kauffman, 2002, p.46).

Van Weele (2005) states, as the same as Kauffman, that many terms and concepts are used in the field of purchasing both in literature and in practice nowadays. And terms like procurement, purchasing, supply management, and logistics management are used interchangeably. Further, Van Weele (2005) depicts the definition of purchasing is:



The management of the company's external resources in such a way that the supply of all goods, services,, capabilities and knowledge which are necessary for running, maintaining and managing the company's primary and support activities is secured at the most favorable conditions (van Weele, 2005, p,12).

#### 4.2.1 The Role of Purchasing in the Value Chain

Take Porter's value chain as a point of departure to show the role and importance of the purchasing function. Porter (1985) refers that each firm is a collection of activities, including design, production, marketing, delivering and support its products that are valuable for customers. All these activities can be represented by a value chain, shown in Figure 4. Porter (1985) claims further that the performances of the individual activities in the value chain reflect every firm's history, strategy, approach to implementing its strategy, and the underlying economics of the activities themselves.

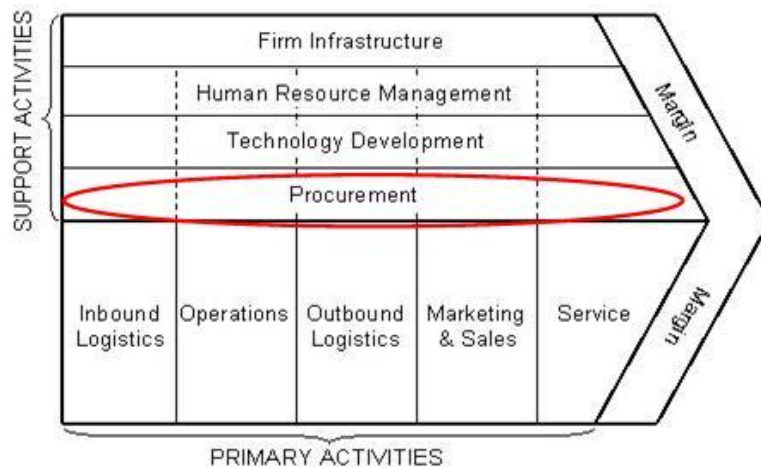


Figure 4: The Value Chain (Porter, 1985, p.37)

Porter (1985) considers that the value chain in Figure 4 comprises value activities and a margin which achieved by these activities. Value activities can be divided into primary activities and support activities. Primary activities are “the activities involved in the physical creation of the product and its sale and transfer to the buyer as well as after sale assistance” (Porter, 1985, p.38). There are five generic categories of primary activities, inbound logistics, operations, outbound logistics, marketing and sales, and service. On the other hand, support activities have the objective to support the primary activities and other support activities such as procurement, in order to make the value chain as efficient as

possible (Porter, 1985). Support activities grouped into four categories, procurement, technology development, human resources management, and firm infrastructure. “The dotted lines reflect the fact that procurement, technology development, and human resource management can be associated with specific primary activities as well as support the entire chain” (Porter, 1985, p.38).

Porter (1985) considers purchasing<sup>1</sup> as a support activity in generic value chain, which refers to “the function of purchasing inputs used in the firm’s value chain, not to the purchased inputs themselves” (Porter, 1985, p.41). Purchased products and inputs are regarded as products used for adding value to the end-product, and they are commonly associated with primary activities. However, purchasing activities are not value-adding themselves, because purchased inputs are present in more than one primary activity<sup>2</sup>.

Therefore, purchasing can be considered as a support activity covering all the different primary activities, which presented by Porter (1985). In addition, Porter (1985) states that the cost of purchasing activities usually consists of a small part of total costs, but often have a significant impact on the firm’s overall cost and differentiation, where will be presented later.

Except the role and position of the purchasing function make value chain management play a central role in business strategies, the purchasing function makes importance to business as well. Purchasing has a significant impact on firm’s total business, that is, purchasing value represents large proportion of costs for a company. According to van Weele (2005) in general the largest part of the cost of goods sold appears to be taken up by purchased material and services. In order to enhance the effect of the purchasing saving, purchasing policies and strategies can contribute to business success in several ways. “Purchasing policies can significantly improve sales margins through realizing substantial cost saving” (van Weele, 2005, p.16). Money saved in purchasing directly result in money added to the bottom line. Second, purchasing policies and strategies can contribute to a

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<sup>1</sup> The terms purchasing and procurement are used interchangeably in this paper.

<sup>2</sup> Transportation service as a purchased input may be used in more than one primary activity, e.g. inbound logistics and outbound logistics. Another example might be ERP-system used in the entire company.

higher capital turnover ratio. The better organization and management of quality and logistics towards supplier relationship, the greater effect on the turnover ratio of a firm has. Third, “suppliers may contribute, when addressed properly, significantly to the company’s innovation processes” (van Weele, 2005, p.16). In other words, better buyer-supplier relationships can lead to good cooperation in an innovation process. In addition, close buyer-supplier relationships might also result in mutual innovation processes, which can be beneficial for both parties.

#### **4.2.2 The Professional Purchasing Function**

In previous sections, the definition of purchasing has been introduced as a broad concept. However, distinct definition is also presented, that is, the purchasing function traditionally encompasses the process of buying. And this can be used as fundament further in this paper.

A well-know definition of purchasing objectives is: to buy the right quality of materials, in the right quantity, at the right time, from the right source, at the right price. But such familiar statement is criticized as being simplistic and superficial. Although this is probably valid comment, van Weele (2005) claims that a good purchasing objective should be measurable in some way. In order to present purposes, van Weele (2005) suggests remembering the need to work as an effective function in the management team. The following statement of objectives is suggested (van Welle, 2005, p.13):

- To determine the specification specially in quality and quantity of the goods and services the firm need to purchase;
- To select the most suitable supplier in the market and to develop methods, routines and systems for selecting the best suitable supplier;
- To prepare and conduct negotiations with selected supplier to meet an agreement and to write up the contract;
- To place the order with the selected supplier and/or to develop efficient purchasing order systems and handling systems;
- To monitor and control of the order to secure supply;
- To follow up and evaluation of the buyer-supplier relationship (settling claims, keeping product and supplier files up-to-date, supplier rating and supplier ranking).

Above the list enumerates the main objectives covered by the purchasing function. According to van Weele (2005) a purchasing manager should support each of the six activities mentioned as parts of the purchasing function. However, this does not necessarily imply that the purchasing department of a firm should conduct and perform all these activities. Van Weele (2005) claims that it is not the responsibility for the purchasing function to include activities such as materials requirement planning, inventory management, material scheduling and storing, incoming inspection, and quality control etc. That is, the purchasing department does not directly include all different purchasing operations in a firm. But in order to achieve effective purchasing operations, they should be "...closely linked and interrelated to these material activities" (van Weele, 2005, p.13). In other words, the method, continuous cooperation and coordination within such activities and the purchasing department of a firm, will secure that purchasing operations are carried out in the most effectively way. An example of such an activity might be evaluating the quality of the purchased product and its specifications.

### **4.2.3 Buying Internationally**

Some buying companies prefer to purchase from suppliers located nearby, who has a similar culture, speak the same language, do business in the same legal system, has a shorter communication, and no currency exchange problems. However, the world is globalizing and the trade is gradual internationalizing. It gives opportunity for internal companies to source from abroad in commercial purchasing. Nowadays, perhaps for many organizations, and not just the multi-national corporations, turn foreign sourcing into mainstream sourcing. Baily et al. (1998) suggest that the fundamental principle between purchasing from a foreign source and purchasing from a domestic source is quite similar, like that the purchased product has the same value and much the same range of systems are used in this pursuit. Further, Baily et al. (1998) illustrate some reasons for foreign sourcing.

- The purchasers may be compelled to go abroad for buying what they are required. Because these products are not produced in domestic industries.
- The buyer may prefer to purchase new type and new model products from a foreign source that these special features cannot be found in domestic industries.
- Though domestic market offers products of the type required, the capacity can not meet customers' demands. Therefore, it is necessary to use foreign source.
- For some strategic reasons, buyer should have a second source in foreign country in order to improve supply security.

- It may be possible to buy equivalent goods more cheaply abroad, because of lower raw material costs, larger quantities, lower production cost, better productivity, lower labor costs, or the rate of exchange.

Above shows some advantages on using foreign sourcing, however, disadvantages exist at the same time. The main problems associated with foreign sourcing are shown by Baily et al. (1998).

*Communication problem:* Language difference, time differences between countries or trading terminology differences may essential to cause communication difficulties. Hence mutual understanding is most important. Because English is the standard language of international trade, it is better to use English or other shared language in communicating their business and even in editing the contract in order to avoid some misunderstanding happening.

*Currency differences:* The extent of exchange rates fluctuate will cause some considerable problems. The risk and uncertainty related to change in relative values between the importers' and the exporters' currencies have to be pay attention and executed. In addition, Baily et al. (1998) claim that prices can be stated in a third currency, such as US dollar, which can be used as the denominated currency in international trading.

*Payment:* Baily et al. (1998) explain that the international transfer of funds poses its own difficulties, and usually need the third party bank to facilitate this process. Hence, "this service will cost money, a cost not applicable in domestic sourcing" (Baily et al., 1998, p.245). Sometimes using foreign sourcing will cause the delay, a little bit longer time used for international transfer and more expensive spending associated with international cheque payments than using domestic sourcing.

*Different legal systems:* Most purchasers will buy from overseas through their representative offices or agents in foreign countries. The reason is that these foreign representative offices are familiar with all kinds of legal systems in the local country. It is relatively easy to organize and perform such matters as shipment, insurance, clearance, payment etc.

*Transport:* According to Baily et al. (1998), road, rail, air, water and pipeline are considered as basic modes of freight transport. More than one mode may be used in delivering goods in international transactions. Therefore, some problems, for example delay associated with transport arrangements and congestion at important ports lead to ships queuing, will appear in the international transactions and it will cost expensive to solve these related problems.

*Customs:* Baily et al. (1998) claims that members of the EC process import and export with the single market and abolition of import taxes. Purchasing outside the EC, purchasers must pay attention to avoid unnecessary expense. Reducing the length of time of goods in Customs is very important for the company will deal with an overseas purchasing. Delay costs will be added by every day.

On one side, purchasing internationally will give chances to the company to buy more advanced products and technology which cannot be produced in domestic market or it will help the company to save more purchasing cost based on the lower raw material cost and production cost at international purchasing. On the other side, buying abroad will cause some administrative, organizational, and executive problems, and even a large amount of money will be used to solve these problems. Therefore, purchasing internationally should be handled carefully.

### **4.3 Value Chain Coordination**

Supply chain management is concerned with the relationship between a company and its customers and suppliers (Hill and Scudder, 2002). It can be represented by inter-organizational coordination, that is, companies working jointly with their suppliers to coordinate activities along the value chain in order to effectively supply products to customers and to satisfy customers' requirements. A term of purchasing of a firm within a value chain routinely communicates with each other. According to Hill and scudder (2002) this form of inter-organizational communication may occur in many ways, from the transfer of purchase orders and information technology to sophisticated supplier relationships that based on two companies activities. Hence, the type of coordination requires value chain integration, suggesting that decisions are made jointly with regard to the two firm's procurements, raw materials handling, and logistic activities etc.

### **4.3.1 Purchasing and Competitive Strategy**

Establishing a distinctive, profitable and sustainable competitive advantage is the goal for every company. Only then the company has capability to guarantee its long-term survival in the competitive industrial market. According to Porter (1985), there are three generic strategies that can lead to a distinguishing market position.

The first strategy is cost leadership. It aims to continually work at reducing the cost price of the end product. Porter (1985) claims that the successful factors of using cost leadership is a buying company obtains a large market share. Thus it is possible to produce in large volumes, on new-style production lines, with specialized production equipment. In addition, Porter (1985) indicates that quality and service should be realized as well, but costs come first.

As mentioned, purchasing has a potentially major influence on the total costs in value chain. Three main methods introduced by Porter (1985) in order to minimize purchasing costs. The first idea is “tune specifications of purchased inputs to meet needs more precisely” (Porter, 1985, p.106). Understanding what the company exact need, then ordering the product accurate specifications, such as quality, quantity, volume etc, in coherence to the firm’s requirements, through thus can decrease purchasing costs. The second method is to “enhance bargaining leverage through purchasing policies” (Porter, 1985, p.106). Firms can take a series of specific actions to enhance their bargaining power with suppliers. For example, by keeping buying processes with a handful of suppliers will increase purchasing bargaining power in order to generate supplier competition. Such benign supplier competition may lead to a stronger bargaining power in purchasing and then lower its costs. After globalization, many companies expand quickly, and have gradually developing their own subsidiary companies. It is an opportunity for these sister companies to combine purchasing activities in order to enhance their bargaining power in purchasing. The third suggestion to minimize purchasing costs is to “select appropriate suppliers and manage their costs” (Porter, 1985, p.107). Through analyzing the behavior of suppliers, a firm should choose those suppliers which have most efficient performance or provide the least costly product to use given the firm’s value chain. Further, a firm can establish linkages in the relationship and improvement systems with its suppliers; such actions may help the firm to improve costs. In addition, controlling and promoting supplier expenses are also good methods to reduce firm’s costs.

The second strategy is differentiation. According to Porter (1985), a differentiation strategy aims at producing products unique in order to meet customers' special needs. In addition, the strategy aims at creating brand preferences and customer loyalty, thereby reducing the importance of price. Therefore, respond flexibly to customer requirements becomes very important for the company that applies a differentiation strategy.

The last one is focus strategy. It is explained by Porter (1985) is that the company becomes familiar with the main problems and then give a relevant solution through studying the activities of the customer group. Serving a particular, clearly defined group of customers in an optimal way is the object of the focus strategy.

Porter (1985) concludes that the cost leadership and differentiation strategies "seek competitive advantage in a broad range of industry segments", while focus strategy aims at "cost advantage or differentiation in a narrow segment" (Porter, 1985, p.11). This is also supported by van Weele (2000). The importance of Porter's (1985) division is that the company will have to make a clear choice between these strategic alternatives. If the company ignores to do this, it will unable to make a sustainable competitive advantage in the industrial market. On the other hand, van Weele (2000) claims that cost leadership and differentiation require different types of purchasing strategies. In the case of cost leadership strategy, costs and price usually are the most important factors in the negotiations with the supplier. "An important criterion for supplier selection is not so much delivery time, but delivery reliability" (van Weele, 2000, p.138). The consequence of wrong delivery requirements from supplier leads to production failures and expensive production costs. In the case of differentiation strategy, close cooperation and coordination with the supplier is the central factor. According to van Weele (2000), this cooperation can be in the field of product improvement, reduction on lead time, quality control and information exchange. A direct relation between the supplier and the buying company is very important and necessary in this differentiation strategy.

According to Porter (1985), each firm should engage one generic strategy in order to avoid the situation of 'stuck in the middle', that is, firm fails to achieve any of them. A firm is stuck in the middle will compete at a disadvantage because the cost leader, differentiators, or focusers will be better placed to compete in any segment. It possesses no competitive advantage. Hence, two different firms should focus on their own competitive strategies. In



addition a value chain is one type of organizational forms of a firm. By means of building, integrating and coordination of value chain, the coordination strategy can be achieved. Since different companies have their own competitive strategies, all activities in each value chain are also different. For example, different firms have different infrastructures, diverse technology levels, various labor skills and distinct procurements.

### **4.3.2 Interrelationships between Value Chains**

Interrelationships can be considered as one method of coordination all activities within different value chains. Porter (1985) claims that there are two types of possible interrelationships among all activities along value chain: tangible interrelationships and intangible interrelationships.

“Tangible interrelationships arise from opportunities to share activities in the value chain among related business units, due to the presence of common buyers, channels, technologies, and other factors” (Porter, 1985, p.323). Tangible interrelationships can be analyzed by value chain. A business unit of a firm can potentially share any value activity with the same business unit in another firm in the same field of industry, including both primary activities and supporting activities. For example, raw materials can be purchased from the same supplier for two companies. Semi-finished produces can be machining and handled jointly. The processes of development of technology on new products can be shared. Therefore, tangible interrelationships will lead to many possibilities of sharing, sharing of research and development, sharing human resources and so on. According to Porter (1985), sharing an activity can lead to a sustainable competitive advantage if the advantage of sharing reduces costs or enhances differentiation. Of course, sharing will cause some cost, which “ranges from the cost of coordinating among the business units involved to the need to modify business unit strategies to facilitate sharing” (Porter, 1985, p. 326).

On the other hand, intangible interrelationships involve “the transference of management know-how among separate value chains” (Porter, 1985, p. 324). That is, a firm will gain know-how through operating one business unit, and it will give advice and allow improving the way another similar business unit competes. According to Porter (1985), the transfer of skills among separate value chains can go in either direction, e.g., one partner transmits skills to the other partner or vice versa. In addition, the transference of generic know-how can occur anywhere in the value chain. Information sharing can be considered

as one of examples of intangible interrelationships. And such information sharing between two firms is a major indicator of the use of value chain. Since information flows seamlessly in both directions, a virtual value chain can be created and further can integrate the entire value chain into one longer chain (Hill and Scudder, 2002). Information sharing may include product description and prices, supplier information, buying process, shipment tracking and tracing. However, this type of arrangement only supports independent planning done by each company (Harrison and van Hoek, 2005). Through the arrangement of information sharing, each company is aware of the other company's activities, uncertainty can be relatively reduced. Another example of intangible interrelationships is skill and knowledge transferring. Usually the level of skill and knowledge of two different companies are not the same, this kind of coordination between value chains becomes very important. It is possible for workers from a company who possess plentiful design, engineering and marketing know-how to cooperate with less-skilled workers in another company. By means of learning from each other, each company will have opportunity to understand more advanced knowledge and to improve itself in the industrial market. In accordance with Porter (1985), through transference of generic skills or know-how, intangible interrelationships will lead to competitive advantage. This may reduce the activity cost or make it more unique and outweigh any cost of transferring the know-how (Porter, 1985).

### **4.3.3 Impediments to Achieving Coordination**

Achieving tangible interrelationships requires applying sharing activities in business units of separate value chains of two firms. Similarly, achieving intangible interrelationships requires transferring of know-how among business units. Hence, in order to coordinate all activities between different value chains, the pursuit of interrelationships should be analyzed and executed very well, which may lead to joint activity with more than one sister unit in different parts of the value chain (Porter, 1985). According to Porter (1985), no matter how a firm is organized, implementing any interrelationships inevitably needs coordination cost. In addition, interrelationships require business units to modify their behavior in some way. Some necessary costs caused by interrelationships represented by Porter (1985).

- cost of coordination
- cost of compromise
- cost of inflexibility

The first one is coordination cost. Business units must coordinate in such field as planning, designing, operating and resolving problems in order to share an activity. “Coordination involves costs in term of time, personnel, and perhaps money. The cost of coordination will differ widely for different types of sharing” (Porter, 1985, p.332). For example, frequently communication is a key factor to achieve joint procurement. Because a good communication will lead to a better understanding within different departments in a firm or same departments in different firms, in order to ensure the quantity and quality of a purchased input required by each business unit. In addition, the coordination cost will be impacted by the potentially greater complexity of a shared activity (Porter, 1985). Because of the specific activity, the added complexity of a shared activity is not the same. For example, sharing a logistical system between two companies which using the same production and package line become more complexity than sharing a computerization information database. “The added complexity of a shared activity can sometimes offset economies of scale or reduce the rate of learning compared to an activity serving one business unit” (Porter, 1985, p. 332). Therefore, while sharing can increase scale and learning, it also can change the relationship between scale or learning and cost. It is significant because changing the scale-sensitivity or learning-sensitivity of an activity in business unit will lead to benefit or hurt the firm’s cost position relying on its situations (Porter, 1985). Thus computerization generally increases frequency of information changes and reduce the handling cost of the complexity of sharing. The consequence is that the interrelationships are getting more and more important (Porter, 1985).

The second is compromise cost. Sharing an activity needs that “an activity will be performed in a consistent way that may not be optimal for either of the business units involved” (Porter, 1985, p.332). For example, sharing component fabrication indicates that the design of the component cannot strictly match one company’s requirement because the component will meet another company’s need as well. Porter (1985) claims that except costs of the shared value activities are included in compromise cost, costs of other linked value activities should be included in compromise cost as well. Sharing component fabrication, for example, may reduce the complexity of purchasing like that it is possible to buy raw materials from one supplier, thereby increasing the difficulty of product design needed. According to Porter (1985), the business units sometimes must compromise their requirements to share an activity is almost a given. The compromise cost may be high enough to nullify the value of sharing, or may be little influence. For example, if two

companies want to share a transportation system to transit products of widely different size, weights, delivery time and frequencies, such inappropriate transportation system will lead to serious influences of the cost saving of sharing between the companies. However, sharing procurement of commodities just involve little or no compromise (Porter, 1985). Further, Porter (1985) indicates that since the particular value activity plays a differing role in one business units compared to another because of its strategy, the compromise cost may be different. For instance, the compromise involved in joint procurement of a common grade of electrical components become more serious for a company using differentiation strategy to produce high technology products than it is for another company used cost leadership strategy. On the other hand, Porter (1985) explains that the compromise cost will be frequently reduced if an activity is designed for sharing activities among business units. Consequently, cost of compromise is an important part of cost of sharing.

The last one is inflexibility cost. Porter (1985) illustrates two forms of inflexibility, the one is potential difficulty in responding to competitive moves and the other one is exiting barriers. Sharing will raise the difficulty to respond quickly to competitors, because “attempting to counter a threat in one business may undermine or reduce the value of the interrelationships for sister business units” (Porter, 1985, p.334). On the other side, sharing will raise the difficulty to exit. Porter (1985) claims that it is no benefit for a business unit exiting with no competitive advantage, further it will harm other business units sharing an activity with it. “Unlike other costs of sharing, the cost of inflexibility is not an ongoing cost but a potential cost should the need for flexibility arise”. (Porter, 1985, p.334) Hence, the inflexibility cost relies on the possibility of the need to respond or exit.

Achieving any interrelationships in coordination between value chains needs some costs of coordination, compromise or inflexibility. The advantage of sharing an activity must be weighed against these costs, and then to determine whether it is possible to get interrelationships, and to calculate the net competitive advantage of sharing.

#### **4.4 Supplier Selection**

As mentioned the main activities with the purchasing function are closely interrelated. Figure 5 represents the procurement is a wider term. It includes all activities which aim to make the product form the supplier to its final destination. The purchasing process model

encompasses the purchasing function, product transportation, stores, and quality control and assurance etc. Supplier selection is one of the most important activities in the purchasing function. Moreover, one of the most important concerns of any purchasing manager is looking for the most competitive suppliers worldwide and to develop effective relationships with them. The supplier selection process nowadays is of quite complexity and significance for a company. Hence selecting the best suitable suppliers is a difficult process. Meanwhile it is crucial to the overall performance of the company as well.

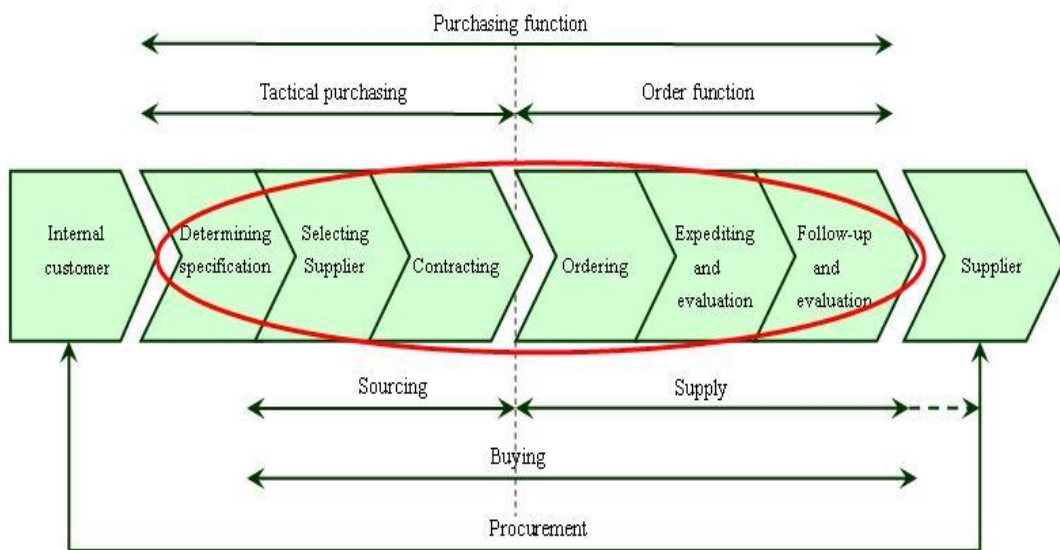


Figure 5: The Purchasing Process Model (van Weele, 2000, p.15)

“With the increasing significance of the purchasing function, purchasing decisions become more important” (de Boer et al., 2001, p.75). While the world is globalization and competition in the industry market is gradually impetuous, the term of purchasing becomes more and more dependent on its supplier. Changing preferences among customers require a broader and faster selection (de Boer et al., 2001). In addition, the direct and indirect consequences of bad decision-making in purchasing processes become more serious than before. According to de Boer et al. (2001) purchasing share in the total turnover typically ranges from 50% to 90% in industrial company, making decisions about purchasing strategies and operations primary determinants of profitability. Florez-Lopez (2007) claims the same viewpoint as de Boer et al. (2001). Supplier selection is one of the most crucial components of the purchasing function in a company, which substantial to enhance the competitiveness of the buying company and to increase customer satisfaction. The supplier

selection framework is illustrated by de Boer et al. (2001), shown in the Table 2. The framework presents the diversity of situations in terms of complexity and importance in purchasing practice on the horizontal axis. On the vertical axis, it indicates the different phases in the supplier selection process, including giving an unambiguous problem definition of supplier selection, formulating the criteria, determining suitable suppliers' qualifications, making a final choice.

	New task	Modified rebuy (leverage items)	Straight rebuy (routine items)	Straight rebuy (strategic/bottleneck)
Problem definition	Use a supplier or not?	Use more, fewer or other suppliers?	Replacing the current supplier?	How to deal with the supplier?
Formulation of criteria	Varying importance One-off decision	Moderate/high importance Repeating decision	Low/moderate importance Repeating decision	High importance Repeating evaluation
	No historical data on suppliers available	Historical data on suppliers available	Historical data on suppliers available	Historical data on suppliers available, yet very few actual selections
Qualification	No previously used criteria available Varying importance	Previously used criteria available	Previously used criteria available	Previously used criteria available
	Small initial set of suppliers Sorting rather than ranking	Large set of initial suppliers Sorting as well as ranking	Large set of initial suppliers Sorting rather than ranking	Very small set of suppliers Sorting rather than ranking
	No historical records available	Historical data available	Historical data available	Historical data available
Choice	Small initial set of suppliers	Small to moderate set of initial suppliers	Small to moderate set of initial suppliers	Very small set of suppliers (often only one)
	Ranking rather than sorting Many criteria	Ranking rather than sorting Also: how to allocate volume?	Ranking rather than sorting Fewer criteria	Historical data available Evaluation rather selection
	Much interaction No historical records available	Fewer criteria Less interaction	Less interaction Historical data available	Sole sourcing
	Varying importance Model used once	Historical data available Model used again	Model used again Single sourcing rather than multiple sourcing	

*Table 2: The Supplier Selection Framework (de Boer et al., 2001, p.77)*

As shown in the table above, various factors are involved by the supplier selection process. The purchasing situation, such as a new task or a straight re-buy of a strategic item, is not easy to handle. De Boer et al. (2001) claim that new task situations are the most complex, because they have the highest level of uncertainty. “The distinction between new task, modified re-buy and straight re-buy facilitates a recognizable ‘entrance’ for the purchaser and at the same time the classification comprises different levels of uncertainty about the purchase and the accompanying supplier selection” (de Boer et al., 2001, p.78). On the other hand, both supplier selection criteria and Kraljic’s portfolio approach are useful frameworks for explaining the perceived importance and complexity of a purchasing situation will be introduced afterwards.

#### **4.4.1 Supplier Selection Criteria**

Purchasing, as an important area of operational decision of a firm, plays a significant role associated with supplier selection process. Weber et al. (1991) claim that during the past twenty years, the supplier selection process has undergone significant changes, including increased computer technology and communications, and improved quality policy. Most firms regard the use of supplier selection criteria as an important part of their supplier selection process. Weber et al. (1991) further mention that many academic literatures and purchasing practitioners has already focused on the analysis of criteria for selection and measuring the vendor performance since the 1960's. Traditionally, criteria used for selecting and retaining suppliers should focus on internal logistic measures, such as price, on time performance, lead-time, responsiveness and damage, and so on. Thus, price, quality, delivery time and service of four broad categories in supplier selection have been identified by many authors.

Adams et al. (1997) say that “the relative importance of these selection criteria has been examined over various purchasing situations” (Adams et al., 1997, p.17). In an industrial commodity market, product characteristics become more important than other issues like price, support or service. Under the situation comparing single sourcing to multiple sourcing, supplier selection criteria are distinct across different types of product. In the case of single sourcing environments, the emphasis should be placed on technical supporting and product reliability. In the case of multiple sourcing situations, focus should be on price, quality, and delivery. In addition, Adams et al. (1997) mention that for differentiated, operational products, supplier selection criteria should be put on distribution-related attributes rather than product-related attributes. For those office equipments and products, criteria should pay attention to customer serviced-related attributes instead of other issues such as price, product or promotional attributes.

Wilson (1994) indicates his purpose is to explore the relative importance of supplier selection criteria used by purchasing professionals. Wilson (1994) agrees that the key factors generally thought to affect supplier selection decisions are price, quality, delivery and service. However, a more discerning identification of fundamental choice criteria has been put forward in following (Wilson, 1994, p.36).

- Performance criteria. How well the performance does the product do?
- Economic criteria. What are various expense related to buy and utilize the product?

- Integrative criteria. Is the supplier customer-oriented and committed to satisfying or exceeding the buyer's expectations?
- Adaptive criteria. How certain is the buyer that the supplier can manufacture and deliver to product specification?
- Legalistic criteria. What the constraints of legality and policy must be abided while buying this product?

Wilson (1994) presents that because these five types of criteria indicate the different facets associated with a purchase, they can be used in every industrial buying situation. Weber et al. (1991) do a research regarding the importance of the 23 supplier selection criteria based on 170 responses from 273 purchasing agents and managers chose from the membership list of the National Association of Purchasing Managers. As seen the Table 3, 23 important criteria for supplier selection have been summarized by Weber et al. (1991). Based on the Table 3,

Rank	Factor	Mean rating	Evaluation
1	Quality	3.508	Extreme importance
2	Delivery	3.417	
3	Performance history	2.998	
4	Warranties and claim policies	2.849	
5	Production facilities and capacity	2.775	Considerable importance
6	Price	2.758	
7	Technical capability	2.545	
8	Financial position	2.514	Average importance
9	Procedural compliance	2.488	
10	Communication system	2.426	
11	Reputation and position in industry	2.412	
12	Desire for business	2.256	
13	Management and organization	2.216	
14	Operating controls	2.211	
15	Repair service	2.187	
16	Attitude	2.120	
17	Impression	2.054	
18	Packaging ability	2.009	Slight importance
19	Labor relations record	2.003	
20	Geographical location	1.872	
21	Amount of past business	1.597	
22	Training aids	1.537	
23	Reciprocal arrangements	0.610	

*Table 3: Supplier Selection Criteria (Weber et al., 1991, p. 4)*

Weber et al. (1991) illustrate Table 4 that presents the number of articles in which each criterion is addressed as well as the rank and rating of the criteria based on these 170 informants and their academic literatures. Obviously, criteria such as net price, delivery and quality are discussed in 80%, 59% and 54% of these articles respectively. These three criteria are named as having 'extreme' or 'considerable' importance. In addition, production facilities and capability, geographical location, and technical capability are discussed in 31%, 22% and 20% respectively. Production facilities and capability and technical capability are rated as having 'considerable importance' while geographical



location was categorized to have only ‘average importance’ in research of Weber et al. (1991).

As a result, though some supplier selection criteria are found to vary in different situations, three common criteria emerged as important of the situation. They are price, delivery and quality.

Rank	Rating <sup>a</sup>	Criteria	Number of articles	(%)
6	1	Net price	61	80
2	1	Delivery	44	58
1	1A	Quality	40	53
5	1	Production facilities and capacity	23	30
20	2	Geographic location	16	21
7	1	Technical capability	15	20
13	2	Management and organization	10	13
11	2	Reputation and position in industry	8	11
8	1	Financial position	7	9
3	1	Performance history	7	9
15	2	Repair service	7	9
16	2	Attitude	6	8
18	2	Packaging ability	3	4
14	2	Operational controls	3	4
22	2	Training aids	2	3
9	2	Bidding procedural compliance	2	3
19	2	Labor relations record	2	3
10	2	Communication system	2	3
23	3	Reciprocal arrangements	2	3
17	2	Impression	2	3
12	2	Desire for business	1	1
21	2	Amount of past business	1	1
4	1	Warranties and claims	0	0

<sup>a</sup> Ratings: 1A = Extreme importance.      2 = Average importance.  
1 = Considerable importance.      3 = Slight importance.

Table 4: Criteria (Weber et al., 1991, p. 12)

#### 4.4.2 Supplier integration into Product Development

Supplier selection is one of the important activities of procurement in value chain. The integration of supplier will play a significant role in value chain coordination. “The effective integration of suppliers into value chains will be a key factor for some manufacturers in achieving the improvements necessary to remain competitive”. (Frohlich and Westbrook, 2001, p.185) Therefore, supplier integration into product development will be introduced here. Traditionally, the step of the company to select a suitable supplier is happened after design and manufacturing engineers have determined the final product design. However, Simchi-Levi, Kaminsky and Simchi-Levi (2003) claims that if the company is willing to earn more benefits, the suppliers, who the company selected, should be involved in the design process. That is, the company’s managers should be encouraged to work with suppliers during the product design process in order to gain more benefits for

the company. Benefits include a decline in purchased material costs, a decline in development time and cost, a decline in development in manufacturing cost, an increase in purchased material quality, and an increase in final product technology levels (Simchi-Levi, Kaminsky and Simchi-Levi, 2003).

According to Simchi-Levi, Kaminsky and Simchi-Levi (2003) simply selecting a suited level of supplier integration is not sufficient. In order to ensure a successful supplier relationship, much work should be done. The first is to select suppliers. Once suppliers are selected and identified, it is critical to work on building relationships with them. Because the supplier integration refers to cooperate with engineers in product design, many aspects, such as capability and willingness, must be considered internally. Sharing future technologies and plans with selected suppliers will help the company to build relationship, as does a joint continuous improvement goal (Simchi-Levi, Kaminsky and Simchi-Levi, 2003). As a result, the aim for a buying company is to establish an effective and long-term relationship with suitable suppliers. These will naturally lead to align objectives of the buying company and its supplier, which will result in more effective integration (Simchi-Levi, Kaminsky and Simchi-Levi, 2003).

#### **4.5 Supplier Portfolio Management**

While more attention paid to purchasing and supply increases, the work tends to be more important, concentrating more upon purchasing and supplier strategies. The key point of developing effective purchasing and supply strategies is the importance of influencing the power balance between the buying company and its vital suppliers. Purchasing portfolio approach is generally considered as developing and implementing differentiated purchasing strategies towards their supply markets (Gelderman and van Weele, 2002, Kraljic, 1983). The objective of using differentiated strategies towards their different suppliers is to minimize their supply weakness and make the most of their potential buying power (Kraljic, 1983). In real life, companies tend to deal with a large number of suppliers. Harrison and van Hoek (2005) claims that treating them all in the same way will lose the fact that some suppliers have different requirements to others. Since suppliers represent a different interest to the company, purchasing managers need to differentiated the role of suppliers and to apply appropriate strategies towards them in order to make purchasing and supply chain management resources of the focal firm become more effective.

The portfolio approach was originally suggested by Kraljic (1983). Fundamental to his approach is the idea that, differentiating the role of suppliers based on their different interests, and developing differentiated strategies towards their supply markets. The Kraljic portfolio approach is considered as an important breakthrough in the development of purchasing and supply management theory (Gelderman and van Weele, 2002). The Kraljic portfolio approach gives sufficient guidelines on how to implement and develop effective purchasing and supplier strategies for a company. According to Gelderman and van Weele (2002), not all buyer-supplier relationships should be managed in the same way. Some need to have a close relationship with their suppliers, however, other do not need. Kraljic portfolio approach seems to be the dominant discipline in the profession (Gelderman and van Weele, 2002). Proper using the portfolio approach can result in significant advancements of purchasing and supply strategies.

#### 4.5.1 The Kraljic Portfolio Matrix

The general idea of Kraljic portfolio approach is to “...minimize supply vulnerability and make the most out of potential buying power...” (Kraljic, 1983, p.112). As mentioned, in Kraljic’s approach, the perceived importance and complexity of a purchasing situation is identified in terms of two factors: supply risk and profit impact (de Boer et al., 2001). The supply risk is measured against product availability, make or buy opportunities, number of potential suppliers, competitive structure in supply markets, storage risks and product substitutes. On the other hand, the profit impact should be evaluated by total costs, purchase volume, percentage of total purchasing cost and impact on product quality (van Weele, 2000). The consequence is a 2x2 matrix, which divided into four categories: Strategic, Bottleneck, Leverage, and Non-critical items.



Figure 6: The Kraljic Portfolio Matrix (Kraljic, 1983)

*Strategic products:* According to van Weele (2000) these are high technology, high volume products which are often supplied at customer specification. The buyer has strength but often strategic products can only be sourced from one supplier, and therefore they generate high supply risk. In this situation, “purchasing should use its strength carefully to draw suppliers into a relationship that ensures supply in the long term” (Harrison and van Hoek, 2005, p.247). Usually this type of product has a significant impact on the end product cost price, and thus they are placed in the right upper corner in the Kraljic portfolio matrix (see Figure 6). A typical example of strategic items is engines for automobile manufactures.

*Bottleneck products:* These are items represent “a relatively limited value in terms of money but they are vulnerable in regard to their supply” (van Weele, 2000, p. 149). That is, the buyer has little power, and often bottleneck products can only be sourced from one supplier, and therefore this is a supplier-dominated segment. Hence, this type of product is placed in the right lower corner in the Kraljic portfolio matrix (see Figure 6). A typical example of bottleneck items is spare parts for equipment. The aim of purchasing in this situation is to reduce dependence on these items through diversification to find other possible suppliers, looking for substitute products and continuously improving product design (Harrison and van Hoek, 2005).

*Leverage products:* Van Weele (2000) claims that in general these are the products that can be obtained from various suppliers with standard quality grades. These products represent a significant share of the end product’s cost price, and therefore have a relatively strong profit impact. That is, the buyers have high spending power and they have capable to reduce prices and to push for preferential treatment. Buy-dominated segment can be called here. Thus this type of product is placed in the left upper corner in the Kraljic portfolio matrix (see Figure 6). Because the standardization of leverage products can be sourced from many suppliers, a low supplier switching cost will be spend in leverage products. Typical examples of leverage items are bulk chemicals, steel, aluminum profiles and raw materials (van Weele, 2000).

*Non-critical products:* Based on viewpoint of van Weele (2000), these products are more or less standardized, produce few technical or commercial problems, and have many substitutes available in the supply markets. Usually they have a low profit impact and

many alternative suppliers. Thus this type of product is placed in the left lower corner in the Kraljic portfolio matrix (see Figure 6). Typical examples of non-critical items are cleaning materials, office supplies and maintenance supplies (van Weele, 2000).

#### 4.5.2 Diversified Strategies Tailored for Each Portfolio Quadrant

There are various academic approaches for tailoring strategies for each portfolio quadrant. In this research paper, the leverage products and their relevant strategies should be detailed introduced. However, in order to give an integrated picture to the reader, other diversified strategies will also be outlined in the following sections. The aim for tailoring strategies for each portfolio quadrant is to help professional purchasers differentiate between the various supplier relations and choose appropriate strategies for each category, thus in order to manage effective suppliers (Caniels and Gelderman, 2005).

Gelderman and van Weele (2002) claim that through plotting the buying strengths against the supplying strengths in the Kraljic matrix, three different supplier strategies are identified and associated with three basic power positions (see Figure 7). This matrix gives one recommendation for each portfolio quadrant, i.e. partnership for strategic products that including three different supply strategies: exploit (in case of buyer dominance), balance (in case of a balanced relationship), diversify (in case of supplier dominance); volume insurance for bottleneck products; exploit power for leverage products and ensure efficient processing for non-critical products.

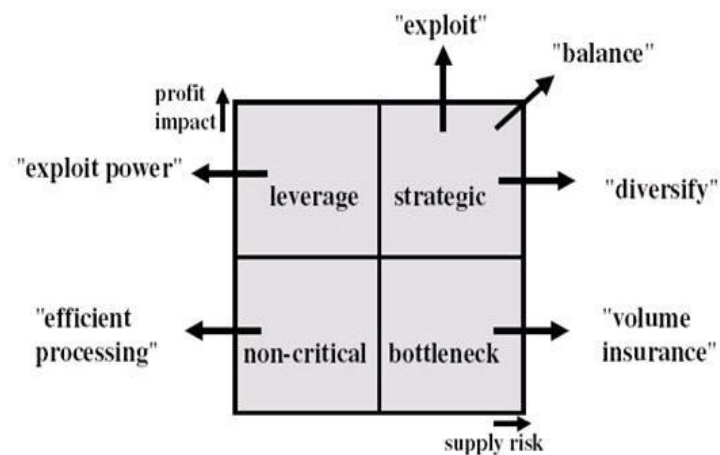


Figure 7: Categories and Strategies in the Kraljic approach (Gelderman and van Weele, 2002, p. 2)

As seen Table 2, de Boer et al. (2001) integrate the four main categories strategic, bottleneck, leverage and routine (non-critical) products to the supplier selection framework. The classification of purchasing situations associated with four main categories presented

by Kraljic, being new task, modified re-buy of leverage items, straight re-buy of routine items, and straight re-buy of strategic or bottleneck items respectively. Key factors describing the four quadrants in Kraljic portfolio matrix are illustrated by de Boer et al. (2001) (see Table 5).

	Low-supply risk	High-supply risk
<b>Low-profit impact</b>	<i>Routine items</i> Many suppliers Rationalise purchasing procedures Systems contracting Automate/delegate	<i>Bottleneck items</i> Monopolistic supply market Long-term contracts Develop alternatives (internally) Contingency planning
<b>High-profit impact</b>	<i>Leverage items</i> Many suppliers available Competitive bidding Short-term contracts Active sourcing	<i>Strategic items</i> Few (difficult to switch) suppliers Medium/long-term contracts Supplier development/partnership (develop alternatives 'externally') Continuous review

*Table 5: Key Words Describing the Four Quadrants in a Portfolio Matrix (de Boer et al., 2001, p.78)*

In the case of new task situations, purchasing situations of relative high importance and situations of relative low importance may be distinguished. However, ignoring the importance, the steps in supplier selection process will be the same (de Boer et al., 2001).

In the case of re-buy situations, more variety related to administration and executions of the steps are expected in the supplier selection process. For example, as a routine item (a non-critical item), there are many available suppliers that can offer the item. But frequently supplier research and different supplier selection will not pay off, due to the low value of the routine product (de Boer et al., 2001). Further, in order to reach an efficient ordering procedure, usually a whole set of related routine products is assigned to one or two suppliers. The supply performance can be reconsidered periodically and if necessary, a new selection will take place (de Boer et al., 2001).

Different to routine products, strategic and bottleneck products have high supply risk. Because of product specification or the lack of materials, there are actually no suppliers to choose from immediately. In addition, the possibility of supplier choice is much smaller and existing supplier evaluation and monitoring should be taken periodically (de Boer et al., 2001).

According to de Boer et al. (2001), leverage products typically involve modified re-buy situations. Because of the low supply risk, there are many suppliers for leverage products to choose from. Further, the high value of products justifies proactive search and frequent supplier selection (de Boer et al., 2001). In addition, in the process of purchasing leverage products, the execution of the first three steps is often decoupled from the final choice. The first three steps, problem definition, formulation of criteria, and prequalification, result in the so-called approved vendor list. Based on the approved vendor list, final supplier choice can be made (de Boer et al., 2001).

De Boer et al. (2001) note that “the framework presented by Kraljic implicitly also addresses the impact of inter-firm relationships between the buyer and the seller on the selection process and the use of decision models” (de Boer et al., 2001, p.79). This is further introduced by Caniels and Gelderman (2005) indicating that power and dependence between buyers and suppliers play a significant role in the Kraljic approach. “The relative power and dependence position of buyers and suppliers are therefore expected to be factors of importance in explaining the conditions that influence the choice of purchasing strategy within each quadrant” (Caniels and Gelderman, 2005, p.142). According to Caniels and Gelderman (2005), mutual dependence and power are closely related concepts. The buyer’s dependence on the supplier is a source of supplier power, and vice versa. For example, buyers are willing to find the most suitable supplier who can provide the appropriate products to meet their needs. Namely, buyers are dependent on their suppliers. On the contrary, suppliers depend on their buyers as well. They need the customers to purchase their products. The result of relative dependence is indicated as power (Caniels and Gelderman, 2005).

In accordance with Gelderman and van Weele (2003), purchasers make a clear distinction between alternative purchasing strategies within each quadrant in the Kraljic portfolio matrix. Some of these strategies concentrate on holding the current position in the quadrant,

while other strategies focus on moving to another position (Gelderman and van Weele, 2003, Caniels and Gelderman, 2005). Such classification of purchasing strategies is much different from those introduced former in this section, because one quadrant is no longer assigned only one purchasing strategy. Figure 8 gives an overview of strategic directions for all categories. Note that the numbers shown in the figure are correspond with the numbers used on each strategy following.

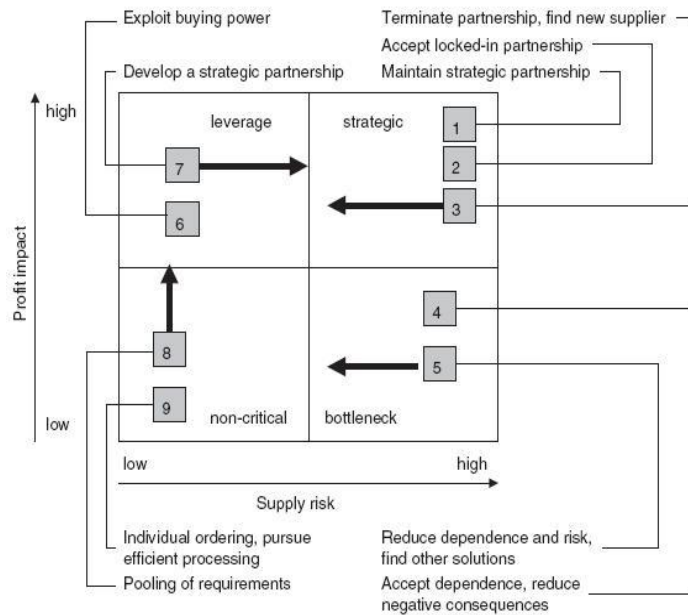


Figure 8: Overview of Purchasing Strategies for All Portfolio Quadrants (Caniels and Gelderman, 2005, p.143)

### Strategic Items

The general recommendation for supplier management in this quadrant is to maintain a strategic partnership. In addition, two additional purchasing strategies will be introduced in this quadrant, that is, accept a locked-in partnership and terminate a partnership, find a new supplier (Caniels and Gelderman, 2005).

1. *Maintain strategic partnership* (holding the position): In order to counterbalance the supply risk, long-term relationships with key suppliers should be established by the firm. Such relationships, including mutual trust, mutual commitment, and an open exchange of information, have a contribution to minimize supply risk (Gelderman and van Weele, 2003, Caniels and Gelderman, 2005). In addition, a close and lasting cooperation with suppliers will improve product quality, reliability, delivery, lead time, and it will lead to cost reduction (Caniels and Gelderman, 2005). This partnership can be characterized as a situation with balanced power. Since both buyers and suppliers



are heavily involved in the relationship, mutual dependence is expected to be high. A successful partnership can be very valuable for both parties (Caniels and Gelderman, 2005).

2. *Accept a locked-in partnership* (holding the position): This strategy often occurs in the supplier dominance situation. The position in the strategic quadrant may be unfavorable conditions. The locked in position is commonly caused by a patent position, monopoly situation and high switching costs of suppliers (Caniels and Gelderman, 2005). These circumstances produce an involuntary stay at the strategic quadrant (Gelderman and van Weele, 2003).
3. *Terminate a partnership, find a new supplier* (moving to another position): This strategy occurs when the performance of the supplier has become unacceptable and incorrigible (Caniels and Gelderman, 2005). A painful process should be started for reducing the dependence on the supplier. The buyers will try to search, develop and contract alternative suppliers. However, in such a situation, there is still supplier dominance, but to a less extent than in a lock-in partnership. Comparing to the two situation mentioned above, buyers and suppliers are lowest involved in the partnership. (Caniels and Gelderman, 2005).

### **Bottleneck items**

According to Caniels and Gelderman (2005), suppliers have a dominant power position for bottleneck products. The general recommendation for supplier management in this quadrant is mainly based on acceptance of the dependence and reduction of negative consequences. An alternative purchasing strategy will be suggested to reduce dependence, risk and to find other suppliers.

4. *Accept dependence, reduce negative consequences* (holding the position): The main focus of this strategy is to assure supply, even at additional cost. In this situation, supplier dominance is expected to be high, and the dependence will be accepted by the buyers. In accordance with Caniels and Gelderman (2005), contingency planning, in combination with risk analysis, consignment systems and ultimately keeping extra stocks, is a possible action for dealing with unexpected bad dependence positions for bottleneck products.
5. *Reduce dependence and risk, find other solutions* (moving to another position): The strategy aims to reduce the dependence on the supplier, and the supplier dominance considered to be less fierce and lower than in scenario 4 (Caniels and Gelderman,

2005). The most common way to achieve reduced dependence is to broaden the product specifications or to search, manage and develop new suppliers. Such measures can result in a lower dependence on a supplier and a lower supply risk (Gelderman and van Weele, 2003). Namely, this will lead a shift towards the non-critical quadrant.

### **Leverage items**

Different from the purchasing of strategic and bottleneck products, there are many possibilities and incentives for buyer to negotiate with different suppliers to purchase leverage items, since small percentages of cost savings usually involve large sums of money. At the same time the supply risk will be minimized (Caniels and Gelderman, 2005). The general recommendation for supplier management in this quadrant is mainly based on exploitation of the buying power. An alternative purchasing strategy is intended to change the current situation, namely, develop a strategic partnership (Caniels and Gelderman, 2005).

6. *Exploit buying power* (holding the position): In this strategy competitive bidding and short-term contracts are favorable options to exploit the leverage position, since products and suppliers are interchangeable (Gelderman and van Weele, 2003). According to Caniels and Gelderman (2005), buyers have a dominant power position for leverage products. Therefore, the buying power is commonly used to get better deal with different suppliers.
7. *Develop a strategic partnership* (moving to another position): In the specific situation, it should be more practical for the focal company to move away from the leverage position. According to Caniels and Gelderman (2005), the leverage position is abandoned in order to search a more strategic partnership with a supplier. This type of cooperative strategy is only pursued when the supplier is willing and has the capability to contribute to the buyer's competitive advantage. Therefore, such a new role is only feasible for supplier who has advanced technology (Caniels and Gelderman, 2005). In addition, when a strategic partnership is established, the involvement of buyers and suppliers will increase correspondingly.

### **Non-critical items**

In conformity to Caniels and Gelderman (2005), non-critical products are usually presented to require about 80% of the purchasing department's time, while at the same time they only represent less than 20% of total turnover. The general recommendation for

supplier management in this quadrant is mainly advised to pooling purchasing requirements. An alternative purchasing strategy is focused on individual ordering and pursuer of efficient processing (Caniels and Gelderman, 2005).

8. *Pool purchasing requirements* (moving to another position): The aim of this purchasing strategy is to reduce the logistic and administrative complexity. According to Caniels and Gelderman (2005), the main idea is to enhance purchasing power by standardization and put non-critical products together in large quantities. The pooling strategy is executed by a systems contracting or a framework agreement with a preferred supplier (Gelderman and van Weele, 2003). Therefore, the strategy increases the buying power of the firm, moves the strategic direction towards the leverage quadrant, and leads to lower direct and indirect purchasing costs.
9. *Individual ordering, efficient processing* (holding the position): “Whenever it is not possible to pool the purchasing requirements, professional purchasers adopt some kind of individual ordering, for instance by means of a purchase card” (Caniels and Gelderman, 2005, p.146). The aim of this strategy is to reduce the indirect purchasing costs, namely ordering and invoicing, and other administrative activities (Caniels and Gelderman, 2005).

These nine strategies represent an unambiguous distinction of different purchasing strategies within each quadrant in the Kraljic portfolio matrix. Consequently, these strategies can be elaborated towards each individual supplier, and probably afford a useful tools for decision makers.

#### **4.6 Buyer-Supplier Relationships**

As the level of attention paid to purchasing increases, the work tends to become more strategic in emphasis, concentrating more upon establishment and development of appropriate relationships with suppliers. Van Weele (2000) claims that efficient and constructive relationships with suppliers are keystone to the firm’s short-term financial position and long-term competitive power. Even small improvements in the supplier relationships may have a significant impact on the firm’s return on net assets. According to Buvik and Gronhaug (2000), inter-firm coordination is a method that a company can extend its portfolio of business units. Inter-firm coordination also indicates the extent of inter-firm flows of activities, information and resources in order to coordinate productive values and manage terms of trade (Buvik and Gronhaug, 2000). A pattern of coordination,

more communication and interactions with suppliers and other functional areas within the buying firm, is needed to ensure both internal and external capabilities to enhance overall performance. The ultimate aim of the buying company and suppliers is to provide the product with the best value to the final customer. Vertical coordination is the organization of the flow of resources and information between the supplier and the buying firm (Buvik, 2002). When analyzing one specific relationship between a company and one of its suppliers, a number of theoretical perspectives on inter-firm coordination will be introduced in this paper in order to develop a formal typology of approaches to relationship management. Transaction cost analysis (TCA) and resource dependence theory (RDT) will be drawn on as a fundament for analyzing and discussing the relationships between buyer and supplier.

#### **4.6.1 Transaction Cost Analysis**

Transaction cost analysis (TCA) keeps the inter-firm transaction as the basic unit of analysis (Buvik, 2001). The basic assumption underlying the TCA-perspective is that the assignment of specific governance forms, such as inter-firm coordination and conventional market contracts, is based on an economizing on transaction costs (Buvik and Gronhaug, 2000). The term transaction costs include both costs of market transactions and costs of internal transactions (Douma and Schreuder, 2002). The main premise of TCA is that there are potential costs combined with carrying out safeguarding, adaptation, and evaluation processes<sup>3</sup> (Heide, 1994). Usually, building a vertical integration in the original transaction cost framework is a general response to these governance problems. Hence, the idea of TCA theory is to organize governance processes that will economize transaction costs.

Transaction economic exchange between buyer and supplier can be considered as the unit of analysis by TCA theory. Specific assets, the uncertainty/complexity, and the frequency are the critical dimensions of inter-firm trade, and the composite of these dimensions decides the way buyer-supplier relationships can be effectively coordinated (Buvik, 2001, Douma and Schreuder, 2002).

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<sup>3</sup> There are two different transaction costs associated with these governance processes. First are the direct costs, which are associated with carrying out governance processes such as safeguarding, adaptation, and evaluation activities. Second are opportunity costs, for example, inapposite adaptation or inaccurate evaluation incurred an appropriate investments not being undertaken (Heide, 1994).

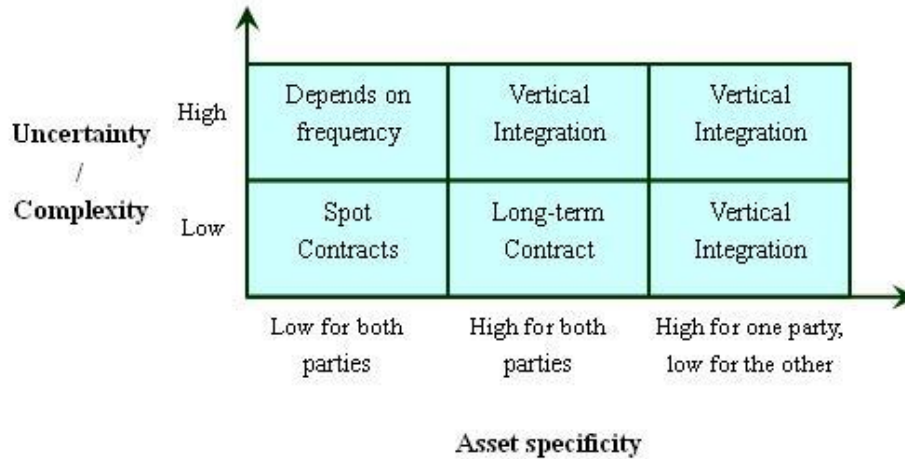
The specific asset of a transaction refers to “the degree to which the transaction needs to be supported by transaction-specific assets. An asset is transaction-specific if it cannot be redeployed to an alternative use without a significant reduction to the value of the asset”. (Douma and Schreuder, 2002, p.151) That is, transaction specific assets are dedicated to a particular relationship and cannot be redeployed easily. The idiosyncratic nature of specific asset gives rise to adaptation and safeguarding problems and creates both bilateral dependence and contractual hazards (Buvik, 2002). While asset specificity increases, greater coordinated adaptation is warranted in order to effectively coordinate productive resources (Buvik, 2002). According to Heide and John (1988), specific assets analysis focuses on the buyer side in purchasing relationships, which means adaptation of specific resources deployed by the purchasing company in the production process, logistics and transportation dedicated to the relationship with a specific supplier. There are three main types of specific assets: site specificity, for example locations can be considered as fixed assets; technical specificity, such as equipment; and human capital specificity, for example, developed and improved skills and technology are specific to a buyer-supplier relationship (Douma and Schreuder, 2002). According to the basic TCA framework, asset specificity employed will lead to small-number conditions accompanying with considerable exposure to opportunism and subsequent transaction costs. Consequently, if asset specificity increases substantially, bilateral dependence will be improved by the cost of handling and the chance of exposure opportunism will be increased as well (Buvik, 2002).

The second dimension is uncertainty/complexity. TCA theory presumes that all individuals are bounded rational<sup>4</sup>, and hence a transaction involves a certain level of uncertainty/complexity that may generate extra costs in the process of acquiring certain products (Douma and Schreuder, 2002).

The third dimension is frequency. Compare to the specific assets and the uncertainty / complexity, frequency is minor important. However, it is critical to governance structure, because high frequency transactions are more easily to recover expense of a specialized governance structure (Douma and Schreuder, 2002).

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<sup>4</sup> Bounded rationality means that individual human beings have limited capacity to formulate and solve complex problems (Douma and Schreuder, 2002).



*Figure 9: How Asset Specificity and Uncertainty/Complexity Determine Governance Structure (Douma and Schreuder, 2002)*

Drawing on Douma and Schreuder (2002), a figure with six general governance forms shows above with a purpose for minimizing transaction costs (see Figure 9). A situation, low asset specificity on both sides and low uncertainty/complexity, can be described as purchasing standardized products. Such standardized products will allow many suppliers to be qualified for the delivery. Spot contracts are suitable in this situation. As the increasing the degree of asset specificity, such as deployment of buyer-specific assets, the conventional market conditions will transform into small number conditions, namely, fewer suppliers qualified allowed for the task (Buvik and Reve, 2002). A situation, the transaction specific assets are high for both parties, can be described as both parties holding hostages. If one party hurts the hostages it holds, the other one can retaliate (Douma and Schreuder, 2002). Hence, employing long-term contract and vertical integration as governance forms in this situation will ensure supply and minimize the risk opportunism. In other words, both parties should pay attention to carefulness in such a instance. The other situation, asset specificity is high for one party but low for the other, can be described as the party with highly transaction-specific assets is vulnerable to opportunistic behavior by the other party (Douma and Schreuder, 2002). Employ vertical integration in such a situation will counter opportunism and secure further transactions due to fewer qualified suppliers and higher switching costs. Consequently, TCA is concerned with ways of aligning appropriate governance forms with the attributes of economic transactions (Buvik, 2002).

#### **4.6.1.1 The Strategic Importance of Specific Assets**

The creation of specific assets is a major strategic issue, and it is both a source of competitive advantage and a barrier to the exit of a relationship (Bensaou and Anderson, 1999). Nowadays, it is impossible for any single firm to manage and execute all of its products and markets, because of continually increasing complex and competitive environment in the rapidly change of globalization and technology innovation of markets. The result is that many companies are forced to focus on their own core competencies, at the same time to enhance the frequency and magnitude of collaboration with other companies (Bensaou and Anderson, 1999). Collaboration with other companies' complementary competencies and resource will lead to a strategic alliance with the focal company so that the focal company can focus on its distinctive core activities. Within strategic alliances, companies will achieve their benefits faster, at less cost, and with higher flexibility and less risk (Bensaou and Anderson, 1999). Therefore, companies will "achieve a competitive advantage by gaining market access, scale economies, and competence development through collaboration" (Bensaou and Anderson, 1999, p.463). In addition, a firm's critical resources may extend beyond its boundaries can be considered as another strategic motive for these relationships (Bensaou and Anderson, 1999). For example in the electronics industry, vertically integrated organizations have transformed into networks of strategic alliances (Bensaou and Anderson, 1999).

According to Bensaou and Anderson (1999), the creation of specific assets is one of the possible and most obvious mechanisms for achieving closeness in inter-organizational relationships. The aim for creation of specific assets is to make difficulty to exit the relationship, and at the same time the exit barrier provides greater incentive for the investor to implement its promises (Bensaou and Anderson, 1999). On the other hand, the creation of specific assets can be described as creating credible commitments (Bensaou and Anderson, 1999). The advantages of credible commitments will result in greater cooperation, joint design, better product differentiation, and lower costs, etc. Bensaou and Anderson (1999) claim that while the creation of specific assets brings such benefits, risks and costs will come as well. If the buyer makes a choice to supplier-specific investment, the buyer will have a choice freedom limitation, and will lead to higher costs and difficulties of switching to another suitable supplier. Further, these specific assets make it difficult to exit the relationship and might lead to supplier opportunism (Bensaou and Anderson, 1999). However, Porter (1985) claims that linkages between a buying firm's

value chain and supplier's value chain will provide opportunities for the firm to enhance its competitive advantage in the relative industry market.

#### **4.6.2 Resource Dependence Theory**

According to Heide (1994), resource dependence theory (RDT) views inter-firm governance as a strategic response to deal with the problems of uncertainty and dependence. Organizations as open systems depend on input and output resources (e.g. external supplies) to meet their goals (Buvik, 2001, Buvik and Reve, 2002). However, few organizations are internally self-sufficient concerning their input and output resources, some potential problems are caused. The lack of self-sufficiency creates potential dependence on the parties from whom the focal resources are controlled. The resource flows are not subject to the firm's control and it introduces an uncertainty problem for its decision making unit (Buvik 2001). The basic premise in RDT is that companies that are facing external dependency and an unpredictable task environment will try to establish inter-organizational arrangements as strategic responses to uncertainty and inter-firm dependence (Buvik and Gronhaug, 2000). The concept of dependency states that the dependency of actor A on actor B outlined by Buvik (2001):

- Proportional to the importance of resources that actor B controls concerning the goal fulfillment of actor A. Supply of strategic products might be one of the examples.
- Inversely proportional to the ability for actor A to replace B and fulfill his goals through using available substitutes for the resource of actor B.

Except the dependency problems, the lack of self-efficiency also introduces an uncertainty problem for the firm's decision making. Heide (1994) claims the main argument for RDT is that companies will seek to reduce uncertainty and purposefully manage dependence through structuring their exchange relationships by establishing formal or semiformal links with other companies. In other words, RDT is concerned with the resources exchange importance and with the ability for parties to replace these resources outside the relationship. Therefore, uncertainty and inter-firm dependence should be primary deal with by the increasing the level of coordination and inter-organizational arrangements.



According to Heide and John (1988), importance of the resource, discretion and the number of alternatives are three elements of dependence. The first one is importance of the resource, the extent to which the organization requires it (Heide and John, 1988). It shows the degree of resource importance to the company. “When the outcomes obtained from a relationship are important or highly valued, the focal party is more dependent” (Heide and John, 1988, p.23). The second element is the extent to which degree the other party has discretion over the resource. This indicates how the outcomes from a relationship are compared to alternative relationships. “Dependence is increased when the outcomes from a relationship are comparatively higher or better than the outcomes available from alternative relationships” (Heide and John, 1988, p.23). The third one is the extent to which there are few alternatives available in the market. “Dependence is increased when fewer alternative sources of exchange are available to the focal party” (Heide and John, 1988, p.23). The same as when there are fewer potential alternative sources of exchange available, dependence is increased.

According to Buvik (2001), companies are confronted with different dependency problems will structure their relations to exchange partners in as favorable way as possible. In order to cope with external dependency and uncertainty, some strategies can be chosen by a company, such as cooptation and joint ventures. These types of inter-firm coordination “offer credible commitments and tie up the exchange partners and represent some kinds of domestication of conventional market transactions” (Buvik, 2001, p.443).

### **4.6.3 The Connection between TCA and RDT**

According to Heide and John (1988), the connection between TCA and the dependency perspective can be observed readily when the replace-ability aspect of dependence is taken into consideration. As mentioned, the transaction specific assets create exchange difficulties for the investing party, and these difficulties “arise from the fact that an opportunistic exchange partner could appropriate some fraction of the value of these immobile assets” (Heide and John, 1988, p.23). The investing party might no longer dependent on the threat of switching to another supplier to induce non-opportunistic performance (Heide and John, 1988). Due to such switching costs, the threat is not realistic. The party with specific assets is potentially relying on exchange partner acting in a good-faith non-opportunistic way (Heide and John, 1988).

Heide (1994) claims that the TCA parallels RDT perspective in that, both theories view non-market governance as a response to environmental uncertainty and dependence. Transaction specific assets can be considered to constitute dependence, because specific assets investing make exchange partner either irreplaceable or only replaceable at a cost.

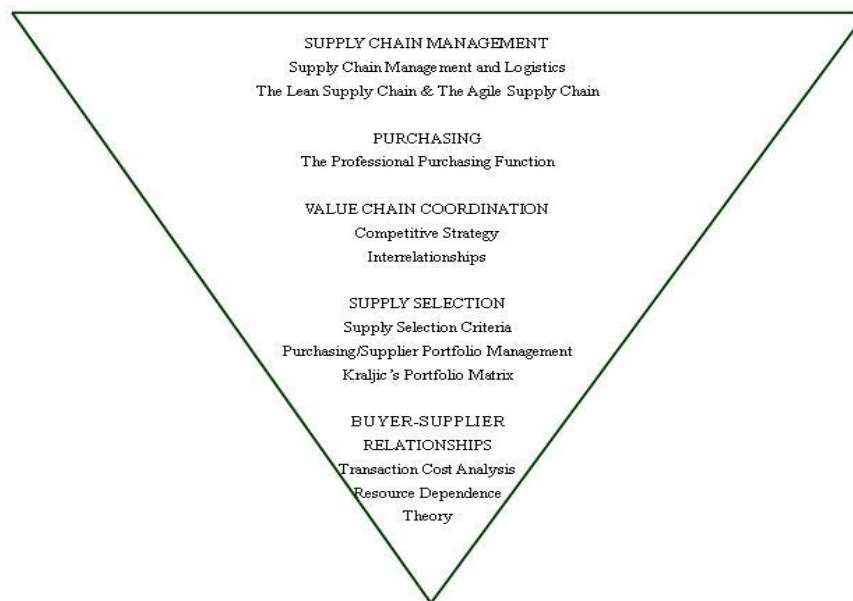
Buvik and Gronhaug (2000) further outline that TCA and RDT pay attention to two different kinds of bilateral dependence. In the TCA model, high specific assets will “transform the transaction into small number conditions and give rise to bilateral dependence with subsequent need for safeguarding and coordinated adaptations.” (Buvik and Gronhaug, 2000, p.446) The RDT-perspective focuses on the resource exchanging importance and the ability of parties to control the flow of input and output resources (Buvik and Gronhaug, 2000). Further, Buvik (2001) states the basic difference between TCA and RDT refers to efficiency and effectiveness. TCA focuses on the efficiency of the actual transaction, and pay attention to “the net gains provided by economies of production and governance performance” (Buvik and Reve, 2002, p.262). RDT-perspective has more focus on effectiveness, and “each actor tries to stabilize and control unpredictable conditions of trade through formal or semiformal links with their trade partner in order to fulfill own goal attainment” (Buvik and Reve, 2002, p.262).

#### **4.7 The theoretical Framework**

The theoretical concepts relevant for the research problem and analysis of this paper will be presented and outlined in this section. The broader concepts of supply chain management and logistics are presented, there further introduced two kinds of supply chain, lean supply chain and agile supply chain. After that purchasing and the professional purchasing function are presented, before going into coordination of value chain. Further the theories are deeply transferring into theoretical concepts concerning supplier selection and development of purchasing strategies, before moving into buyer-supplier specific theory, to embedded investigate a specific buyer-supplier relationships. These theoretical concepts illustrated in the Figure 10.

The theory regarding value chain coordination includes the concepts tangible interrelationships, intangible interrelationships, and some impediments to achieving coordination. Such concepts give advices how to coordinate two different value chains and explain what kinds of disadvantages will be caused by coordination.

The concept of supplier selection criteria is one of the most important theories in the supplier selection. Different companies have various criteria. According to the special requirements of companies, they will build a credible relationship with their suitable suppliers. In addition, the theory purchasing/supplier portfolio matrix is also introduced. The portfolio matrix takes two dimensions, supply risk and profit impact, and further outlines the relevant four categories of products. Meanwhile the theory of leverage product and its relevant strategies should be focused on in this paper. However other theories described about strategic, bottleneck, non-critical products and corresponding strategies just fulfill the picture in order to give an integrated impression to the reader.



*Figure 10: The Theoretical Concept*

The theories, transaction cost analysis (TCA) and resource dependence theory (RDT), refer to develop and manage specific buyer-supplier relationships are outlined in the last part in the theory review chapter. TCA perspective follows an efficiency path to organize in a governance form that will economize transaction costs. However, RDT perspective follows an effectiveness path in that each actor tries to stabilize and control unpredictable conditions of trade through input and output of goods from other parties to fulfill their goals. These two theoretical concepts outline significant ways for analyzing and investigating an ongoing buyer-supplier relationship.

All these theories mentioned in this chapter can be considered as basic principles and assistant methods to analyze and discuss the main purpose in this paper: Coordination between different value chains especially into supplier relationship: see if it is possible to use the same supplier at network for both companies.

## 5. RESEARCH METHODOLOGY

This section will pay attention to the research methodology concerning this specific case study. Research design is introduced before moving into representing of qualitative research design. Thereafter data collection method will be outlined, which includes primary data and secondary data.

### 5.1 Research Design

According to Yin (1994), a research design is the logic that links the data collected and conclusions outlined to the initial research questions of the study. Research methodologies could be classified according to Ellram (1996), into the type of the date used and the type of analysis performed (see Table 6). Type of data can be further divided into empirical and modeling. Empirical data is collected from surveys or case studies from the real world. Modeled data is intended for some kind of manipulation in a model, and gathered either from the real world or from hypothetical data.

		Types of Analysis	
		<i>Primarily Quantitative</i>	<i>Primarily Qualitative</i>
Type of Data	<i>Empirical</i>	Survey data, secondary data, in conjunction with statistical analysis such as: -- Factor analysis -- Cluster analysis -- Discriminant analysis	Case studies, participant observation, ethnography. Characterized by: -- Limited statistical analysis, often non-parametric
	<i>Modeling</i>	-- Simulation -- Linear programming -- Mathematical programming -- Decision analysis	-- Simulation -- Role playing

Table 6: Basic Research Design (Ellram, 1996)

As seen the Table 6, types of analysis are classified into two parts as well. Primarily quantitative method uses statistical and mathematical ways to progress research, while primarily qualitative method focus on written theory and not much statistical and mathematical methods. In the case of this thesis the research design can be defined as a qualitative analysis together with an empirical type of data, because this paper will focus

mainly on coordinating two different value chains between two companies and particular pay attention to supplier relationships. This kind of research fits into the upper right quadrant in the Table 6. This paper will not include any modeling, but some quantitative analysis will be used, for example purchasing costs and transportation costs etc. However, such quantitative analysis will not be heavily emphasized.

### **5.1.1 Qualitative Research Design**

One side quantitative methods have prevailed in many disciplines, especially business disciplines, for example purchasing, logistics, marketing and general management. On the other side, qualitative methods appear to be gaining both acknowledgment and acceptance as valuable and possible alternatives (Ellram, 1996). Qualitative methods are often classified as a case study or a topical study, where a case study focuses on holistic situations in a real life setting, as in this case, a specific coordination. In addition, “the case study method generally emphasizes qualitative, in-depth study of one or a small number of cases. However, case studies may also gather quantitative data” (Ellram, 1996, p.95). Case studies tend to have set boundaries of interest, such as a particular industry, an organization or maybe an individual type of operation (Ellram, 1996). Moreover, Johnston et al. (1999) claims that every case study must begin with theory. It is the degree to which theory and research questions have been developed prior to data collection that allows for the testing of the theory. Based on a theoretical fundament, the research can be carried out, and will explain theoretical concepts that can be used to analyze the data collected. Therefore, the research design can be further defined as a case study in the category of a qualitative analysis. This is a case study of Ulstein Elektro (UEL), which will provide fundamental analysis for the primary idea of this paper: is it possible to use the same supplier at network for both companies UEL and UME?

## **5.2 Data Collection Methods**

There are two types of data, primary data and secondary data. According to Jacobsen (2000), primary data is usually collected from specific people or groups of people and such data is gathered for the first time for the specific research. Collecting, categorizing and evaluating primary data process is normally huge time-consuming. Usually, such process should be prioritized and started early in the project. On the other hand, secondary data is originally collected for other purposes by other people (Jacobsen, 2000). That is,

secondary data is those data collected for other purposes. For example, secondary data might be scientific magazines, financial reports and other master theses etc.

### **5.2.1 Primary Data**

Ellram (1996) claims that “data collection and analysis techniques are really part of process of the case study method; triangulation, which is the use of the different techniques to study the same phenomenon, provides validity within the case study method” (Ellram, 1996, p.100). There are three primary qualitative techniques that can be used in the case study method:

- Direct Observation
- Indirect Observation
- Interviews

Detailed descriptions of these methods are shown in Table 7. In the case of this paper, interviews, considered as explorative researches, are one of the most critical methods for collecting the primary data. According to Bensaou and Anderson (1999), the key informant approach suggests that the most knowledgeable informants should be queried to gather information concerning the specific topic. Such key informants should play roles that make them knowledgeable about the issues concerning the research (John and Reve, 1982). And usually top decision makers will be chosen in the issues. The logistics manager of UEL was interviewed regarding UEL procurement, purchasing strategy, the situation and criteria of supplier selection, and the relationship with its suppliers and so on. The logistics manager also has responsibility for purchasing electrical components and raw materials abroad. UME, as a supplier of UEL, provides Ulstein starters and MCC to UEL. In addition, UME helps UEL to purchase some electrical products in the Chinese market and then export to Norway. Hence the logistics manager often keeps contacting and dealing with some relative projects with UME. The documentations of transportation freight and purchasing price both in domestic market and foreign market are provided by the logistics manager of UEL. On the other hand, managing director of UME was interviewed regarding the company background, current situation, product, production line, purchasing strategy, order situation, supplier selection criteria and its correlative suppliers' information and so on. At the same time, managing director is in charge of purchasing projects with UEL as well. A lot of information about suppliers, unit price of different kind

electronic components and transportation problems are supported by managing director of UME. Moreover, the open individual form of interview is chosen for several reasons. To get better insight in the actual ongoing purchasing processes of the two different firms and to understand specific supplier relationships with two companies, information must to be collected from personnel working with this specific relationship on a daily basis. At the same time the respondents could clear out any obscurities concerning about the procurement process, supplier selection and the relationship of suppliers.

QUALITATIVE DATA COLLECTION TECHNIQUES	
<b>Direct Observation</b>	Kinesics (body language) Unstructured observation Street Ethnography - observe location Structured observation using: -- checklists -- scales for rating -- predetermined categories Participant observation Proxemics (use of personal space)
<b>Indirect Observation</b>	Audio recordings Video tapes Content analysis Diary/self - reporting
<b>Interviewing</b>	<i>Unstructured</i> -- conversational -- key information / elite interview <i>Semi-structured</i> -- ethnographic interview -- focus group -- individual biography -- critical incidents -- historical analysis Structured Interview -- questionnaire (open ended) -- ranking / rating scales -- closed end "tests"

Table 7: Qualitative Data Collection Techniques (Ellram, 1996)

The interviews performed on the personnel at UEL can be classified as semi-structured (see Table 7). The interviews were carried through the main office in Ulsteinvik, Norway, at the respondent own office. The interviews were more organized as a conversation. The interview guide is included in Appendix A. Hence, such semi-structured interviews

become one of the most important sources of primary qualitative data. On the other side, the interview's form at UME was more likely as UEL's. The interview was organized as a conversation and some questions were asked during the whole interview. Therefore, it also can be classified as semi-structured interview. The interview was performed at the respondent own office in Ningbo, China. The interview guide is included in Appendix B. Hence, the information gathered from this interview is also a significant source of primary data.

In addition, continuously contact with key personnel has been performed during the whole writing process. Especially during visiting at both companies, unstructured conversational interviewing has been one of the most important sources of primary qualitative data. Moreover, direct observations are another important source of primary data. During the visits to UEL and UME several tours, both guided and un-guided, the author has been done around the production facility, observing the ongoing activities and process, and so on. According to Ellram (1996), these observations as source of qualitative data can be classified as direct unstructured observations (see Table 7). Yin (1994) gives the similar viewpoint that interviews and direct observations are two of the most important sources for collecting evidence in a case study.

### **5.2.2 Secondary Data**

The resources of secondary data are important for this research paper as well. The company Documentary evidences give general impressions and introduce the main business, products, strategies and the development direction of both companies. Scientific works done for UEL and UME in the past illuminate the activities in the value chains, illustrate the figures of procurement process of the focal company, explain purpose, scope and workflow in the purchasing process, and show information about suppliers and their relevant products and so on. These resources have been used to exposure what researches have been performed regarding both companies in the past, and the valuable data can be further used in this research paper in order to analysis the coordination strategy between both different firms with joint suppliers and their relevant value chains. In addition, the internet pages of Ulstein Group and Shipping China have also been used as sources for gathering secondary data (Ulstein Homepage, 2008, Shipping China Homepage, 2009).



## 6. ANALYSIS

According to the data collection gathered from both companies, the analysis section will be outspreaded. Two different value chains of UEL and UME will be introduced, before it moves into how to process coordination between two different value chains. Some benefits and disadvantages of interrelationships will be outlined thereafter. And then a coordination strategy of two different companies with joint suppliers will be presented at last, which will show that the possibility of using same supplier at network of both companies.

### 6.1 Managing Two Different Value Chains in the Market Segment

The focal company UEL is an experienced electrical products producing company. Since the focal company aims at producing high technology and products unique in order to meet customers' requirements, a differentiation competitive strategy is used. The strategy can help UEL to focus on marketing products which are perceived by the customer as being unique. And it accelerates development of engineering, technology level so that the focal company can gradually enhance products' varieties, flexibility and quick responds to attract customers' attention and tempt to create brand preference and customer loyalty, thereby reducing the importance of price.

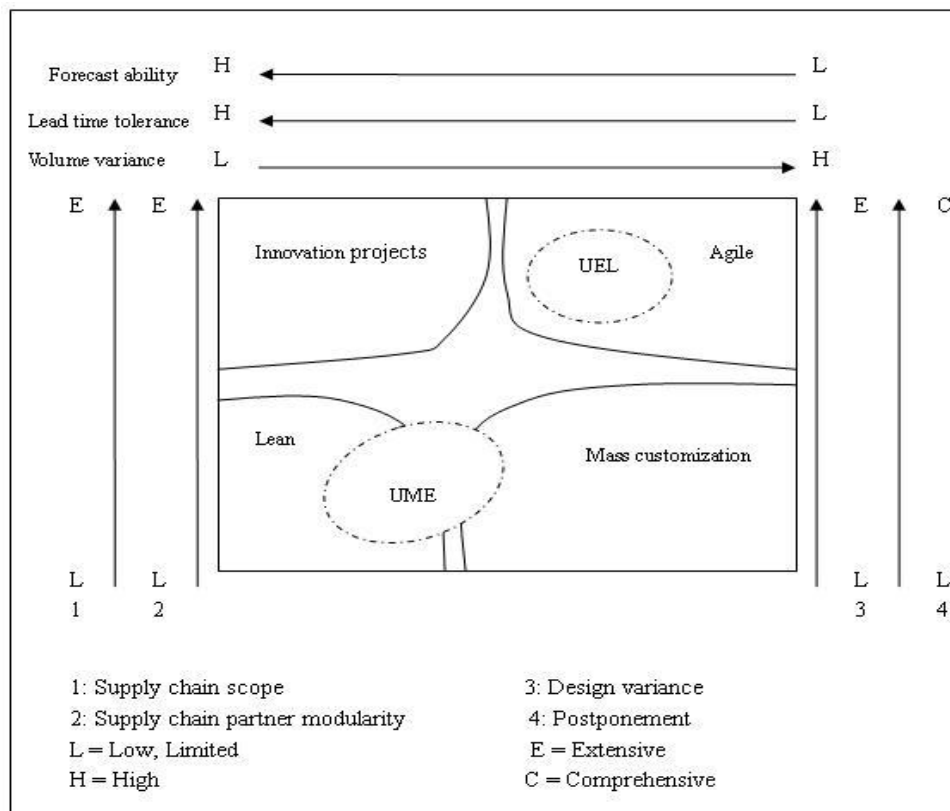


Figure 11: Classifying operating environments

Because these high-end products have following attributes, high product variety, high design variance, volatile marketplace, short product life cycle, low forecasting ability, and low lead time tolerance. According to Table 1, they can be considered as fashion goods and the agile supply chain can be assigned to the focal company. Hence, UEL with agile supply chain is concerned with developing logistics capabilities proactively in unpredictable and volatile marketplace in order to respond customers' demands rapidly and flexibly, in terms of product design, volume and variety, thereby bringing high profit margin as well (see Figure 11).

High-end products produced by UEL, Ulstien COM, Ulstein Bridge, Ulstein Power and Ulstein IAS, aim to sell in the high-end markets such as Scandinavia countries, and developed European countries (see Figure 12). These high-end markets have their own characteristics and need continually products' innovation. For example, the complicated vessel needs high technology and provides to some special customers used in a hard and difficult working place, such as petroleum exploitation. UEL has full experience to produce this kind of vessels. Another example is that based on the current ideas and technology level, UEL will create new electrical products to satisfy some special demands in the new market. Such an innovation no doubt is a large challenge to UEL. However, these high-technology and high-quality products bring lots of engineering design and group works in terms of time, personnel, and money, thereby arising an expensive supply chain cost.

Although high qualified products bring large profits to the focal company, producing such kinds of products increases huge costs simultaneously. Hence it is difficult for the focal company to produce both high-end products and low-end products at the same time. Therefore, UEL tries to find some methods to solve this problem. Based on principle of ensuring product quality, enhancing service level and reducing relevant purchasing costs and production costs, UEL decides to outsource its low-end products to her sister company UME (see Figure 12). Nowadays some low technology products are producing in UME, Ningbo factory. Ulstein local starters and MCC are two primary producing products. In addition, shore connection cabinet, Ulstein bridge alarm system and switchboard are gradually on stream. And these low-end products mainly sell to low-end markets. For example, Asia markets can be considered as meaningful low-end markets with easier products and low supply chain cost.



### 6.1.1 Activities in the Value Chain of UEL

UEL supplies system solutions for electronics, automation and power control for the marine and the industrial markets. A collection of activities, such as design, produce, market, deliver, and support its products are performed by a value chain. According to the real situation of UEL, nine generic categories of activities can be classified more detailed (see Figure 13).

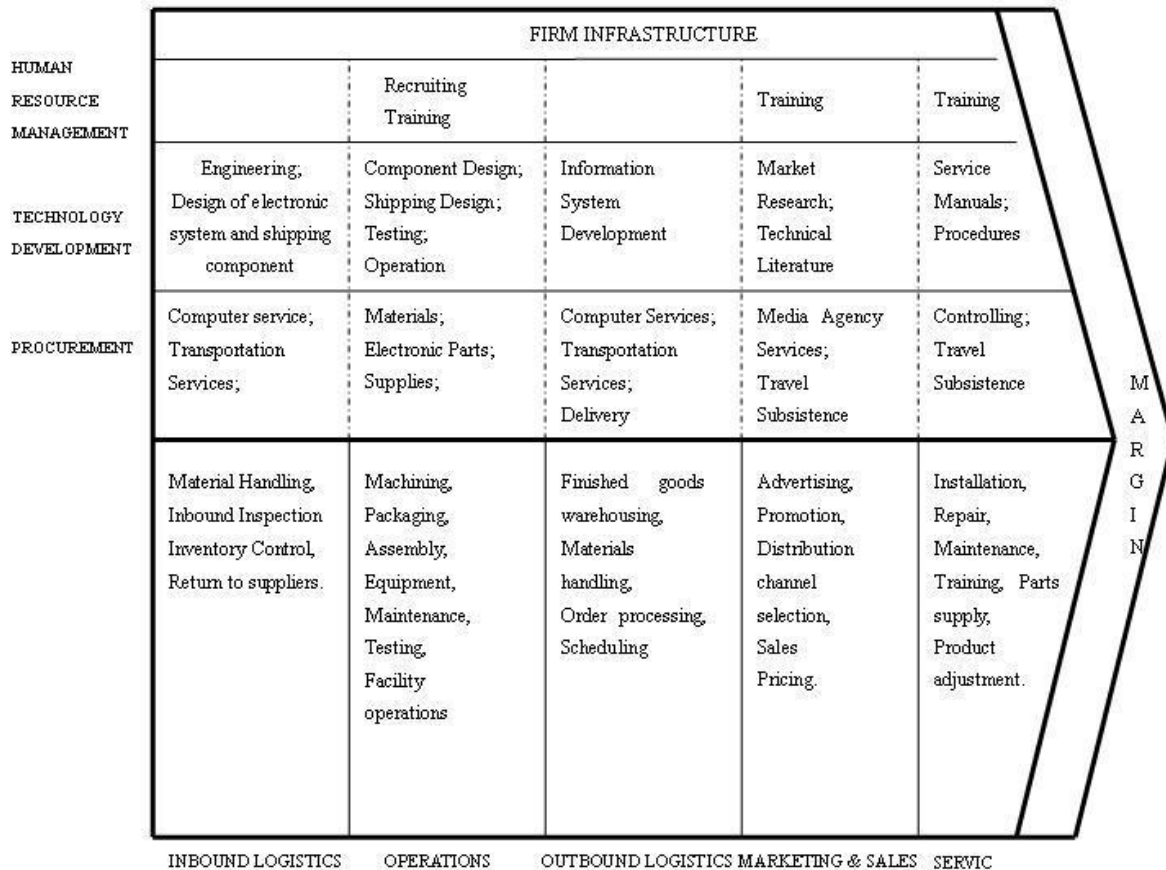


Figure 13: UEL's Value Chain

Value activities are related by linkages within the value chain. The most obvious linkages are those between primary activities and support activities represented by the dotted lines on the UEL's value chain (see Figure 13). For example, procurement practices often affect the quality of purchased inputs and then product quality, production costs, and inspection costs.

Selecting the appropriate category in which to put an activity may require judgment and be illuminating in its own right. The term of Supplier, for example, could be classified as part of inbound logistics and part of procurement, which must be handling carefully. Suppliers will delivery qualified products to UEL, when purchased products arrived in the inventory, inbound inspection and control should be executed. In such a situation, the term of supplier can be considered as part of inbound logistics. Besides, in the procurement process, UEL has its own criteria to select suppliers. After negotiation with suppliers, UEL will decide whether it will use the selected supplier or not. The term of supplier can be considered as part of procurement. Therefore, suppliers not only deliver purchased products but also can influence the performance of the focal company in many ways.

Value activities should be assigned to categories that best represent their contributions to a firm's competitive advantage. In the case of this research paper, the term of supplier should be assigned to procurement which covering the primary activity of operations simultaneously. Because the supplier selection is an important decision to the focal company, and if the focal company can build a good relationship with the selected supplier, such a relationship will bring huge benefit to the focal company. For example, the supplier, Schneider Electric, has a stronger relationship with UEL, since they are sharing both technological development and information with regard to product description and prices, buying process, shipment tracking and tracing and so on. In addition, such a good relationship gives UEL some opportunities. For example, frequent supplier shipments products can lower handling cost, and supplier inspection can remove the need for incoming inspection by the focal company so that the handling cost, inspection cost and control cost of the focal company reduce correspondingly. Besides, it is possible for the focal company to order larger quantities of electrical components at lower price. Based on the trust with its suppliers, UEL will try to buy different kinds of raw materials and components with the same supplier in order to enhance the differentiation of production to meet the various customers' needs.

#### **6.1.1.1 The Purchasing Function of UEL**

According to Figure 4, purchasing function of UEL can be considered as a support activity covering all the different primary activities. Although the cost of purchasing activities usually consists of a small part of total costs of UEL, it often has a significant impact on its overall cost and differentiation. The particular procurement of UEL shown in the Figure 14

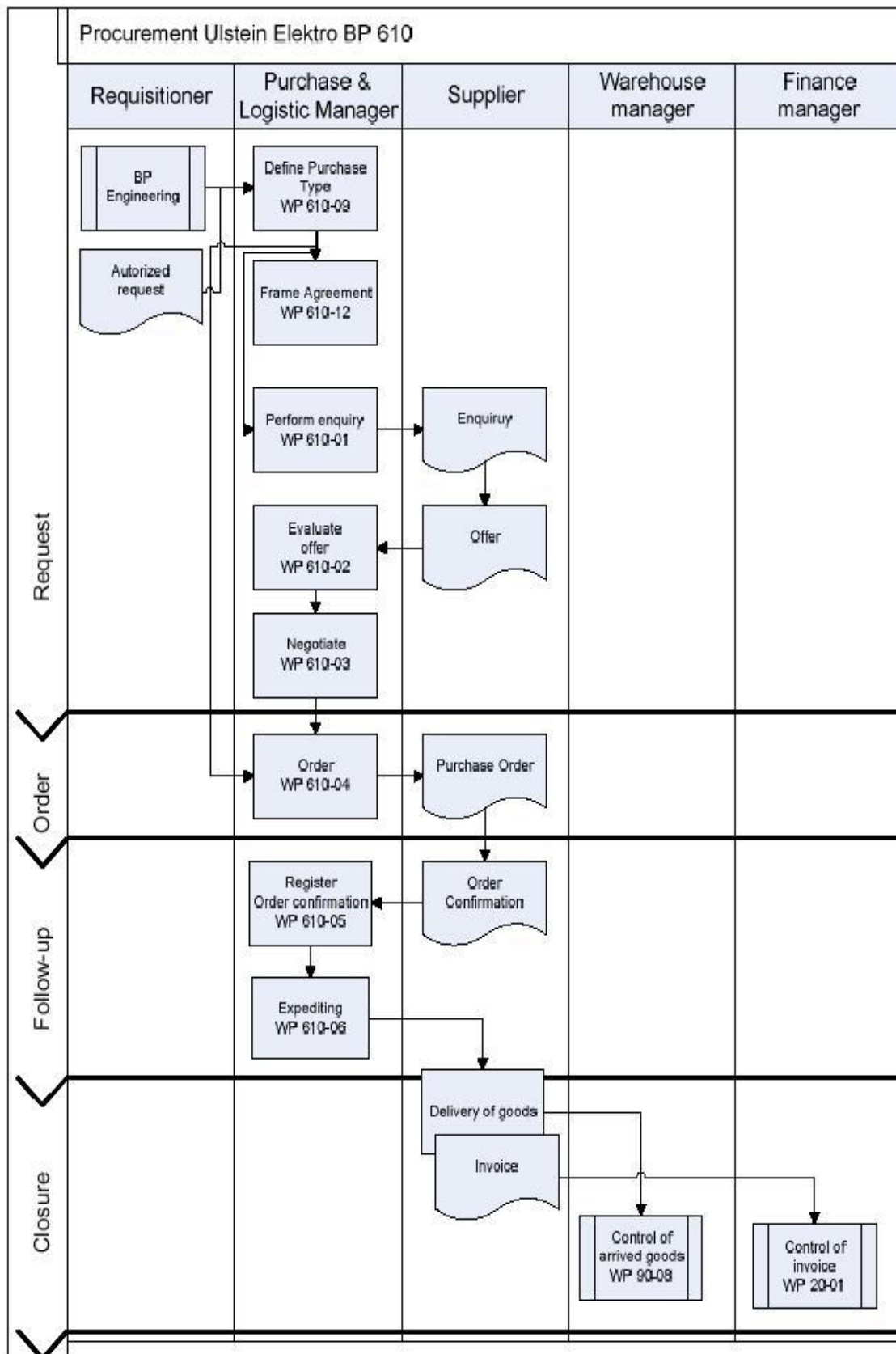


Figure 14: Procurement UEL

with definite purpose is to ensure a satisfactory quality on procurement performed in Ulstein Elektro at all times. All procurements are carried out in accordance with strategic guidelines. And at the same time, it is probable to optimize the cost-effective procurements. As seen the Figure 14, frame agreement in the request period has been mainly taken charge of the logistic manager in UEL. Electrical starters and breakers for Ulstein switchboards are primary purchased products in this paper. Because these products will be purchased continuously and in large scale, frame agreement should be established as the assess approach after purchased type has been defined.

The purpose of establishing a frame agreement is to facilitate a best practice. According to Figure 15, the first step logistic manager should investigate whether this is a renewal of an existing frame agreement or an establishment of a new one. Second step is performing inquiry if there is a new frame agreement. Perform inquiry to the supplier of the desired scope of supply. Estimate need for supply through forecast to supplier based upon sales prognosis on relevant project. Time frame of forecast shall be at least one year.

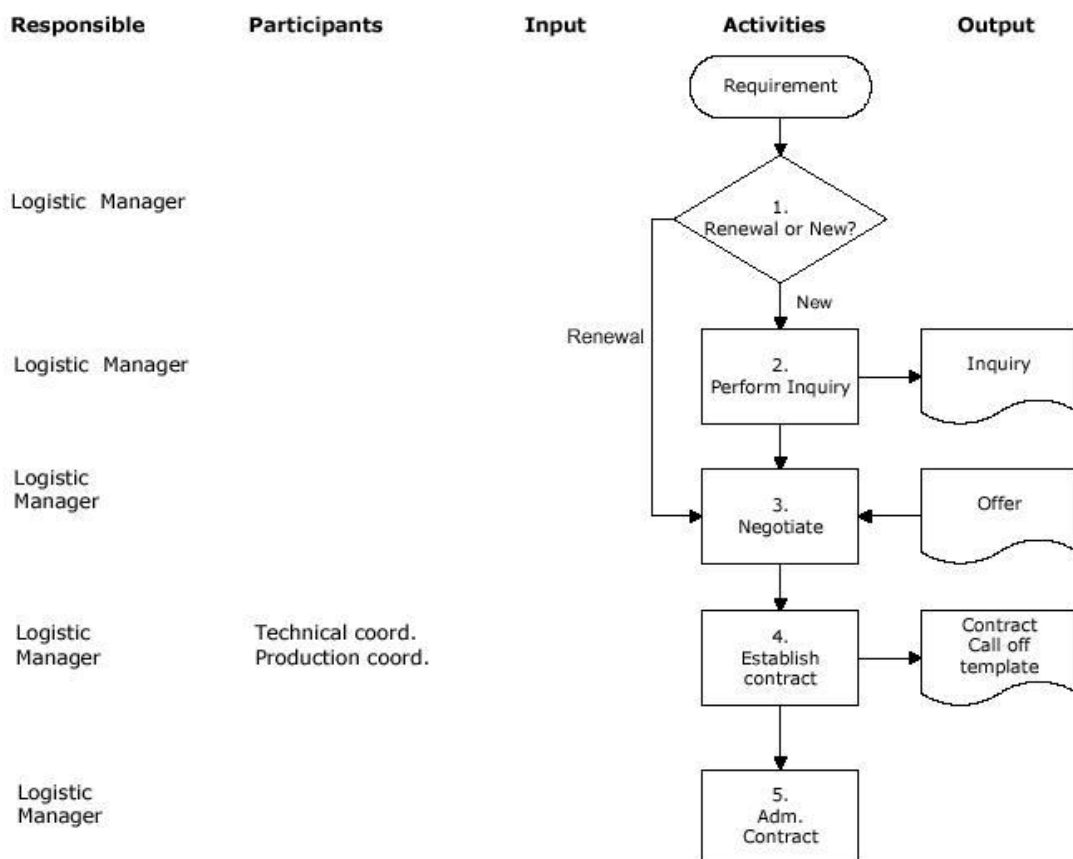


Figure 15: Work Flow of Frame Agreement

The third step is negotiation. When offer is received, evaluate offer and start negotiation if offer is tempting to pursue. If possible, retrieve offers from other suppliers of same products for comparison. UEL has the two mainly suppliers, Phoenix Contact Norway and Schneider Electric Norway, who have responsibility for supplying electrical components. After that is to establish contract. If negotiations are successful, set up a frame contract based upon frame agreement. Send this to supplier and retrieve signed copy. File contract in the data base of our suppliers. And then it is necessary to inform relevant personnel about the contract. The last step is to administer contract. Use the contract to set proper prices, terms and conditions in the following call-offs within the defined scope of supply.

### 6.1.2 Activities in the Value Chain of UME

As a new developing company, UME applies cost leadership strategy as its main strategy for producing electrical products such as Ulstein local starters and MCC.

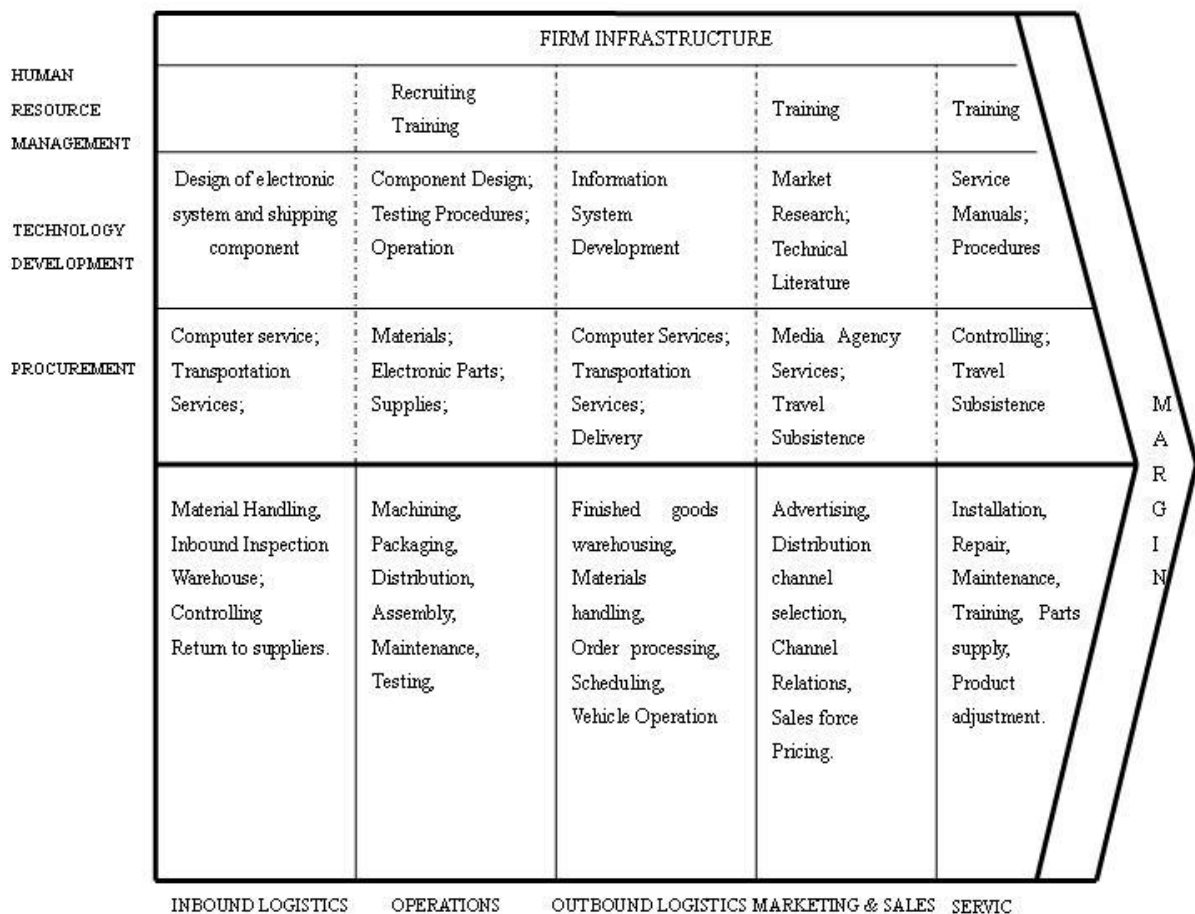


Figure 16: UME's Value Chain



The main idea of UME is to produce low-end products in order to serve in low-end market, thus the company is decided to be located in Ningbo China by Ulstein Group. Due to the special location, the transportation of UME is very convenient. For example, the factory is near Ningbo Port, it is easier to ship products abroad. Besides, it can convenient to arrive the railway station and airport, products can be sent everywhere in the domestic market. Moreover, these standardized products are more popular and they have large market demands. Hence, the potential development of UME is enormous. Almost all of the suppliers of UME are located in the domestic market, most are in Ningbo and Shanghai. The term of supplier in the value chain can be also considered as part of procurement. Phoenix Contact China and Schneider Electric China are two primary suppliers provided electrical components to UME. The list of electrical component supplied by these two suppliers is in the Appendix C, which includes components' name, price, delivery time and weight. Consequently, comparing with UEL, UME has a totally different value chain. And individual activities of UME are reflections of the company's history, strategy and market segment and so on (see Figure 16).

### **6.1.2.1 The Purchasing Function of UME**

Because UME is in set-up phase, the purchasing process is gradually developing. UME has its own customers in the domestic market, such as Jets. Besides, it is also a supplier to UEL. UME receives orders from UEL, managing director or engineers in UME will decide which materials and electrical parts will be used in the local factory. Then they hand over the list to purchasing or logistic supervisor to fill out the purchasing requisition that the managing director has to sign before the purchasing starts. For some of the most common products, such as electrical starters and breaker, usually are purchased once a week. For the bigger and more expensive products such as consoles components are purchased approximately once a month.

## **6.2 Coordinating Two Different Value Chains**

According to Porter (1985), each firm should apply one generic competitive strategy. If a firm engages in each strategy but fails to achieve any of them, such a situation will cause disadvantage and no competitive advantage for the firm. A differentiation competitive strategy is applied by UEL in order to supply best qualified products and unique product's design to meet custom's special requirement. On the contrary, UME applies competitive

strategy of cost leadership, which aims to continually lower cost. Facing a coordination problem, value chain is one kind of organization and becomes a means of reaching the coordination strategy even if UEL and UME have two totally different competitive strategies.

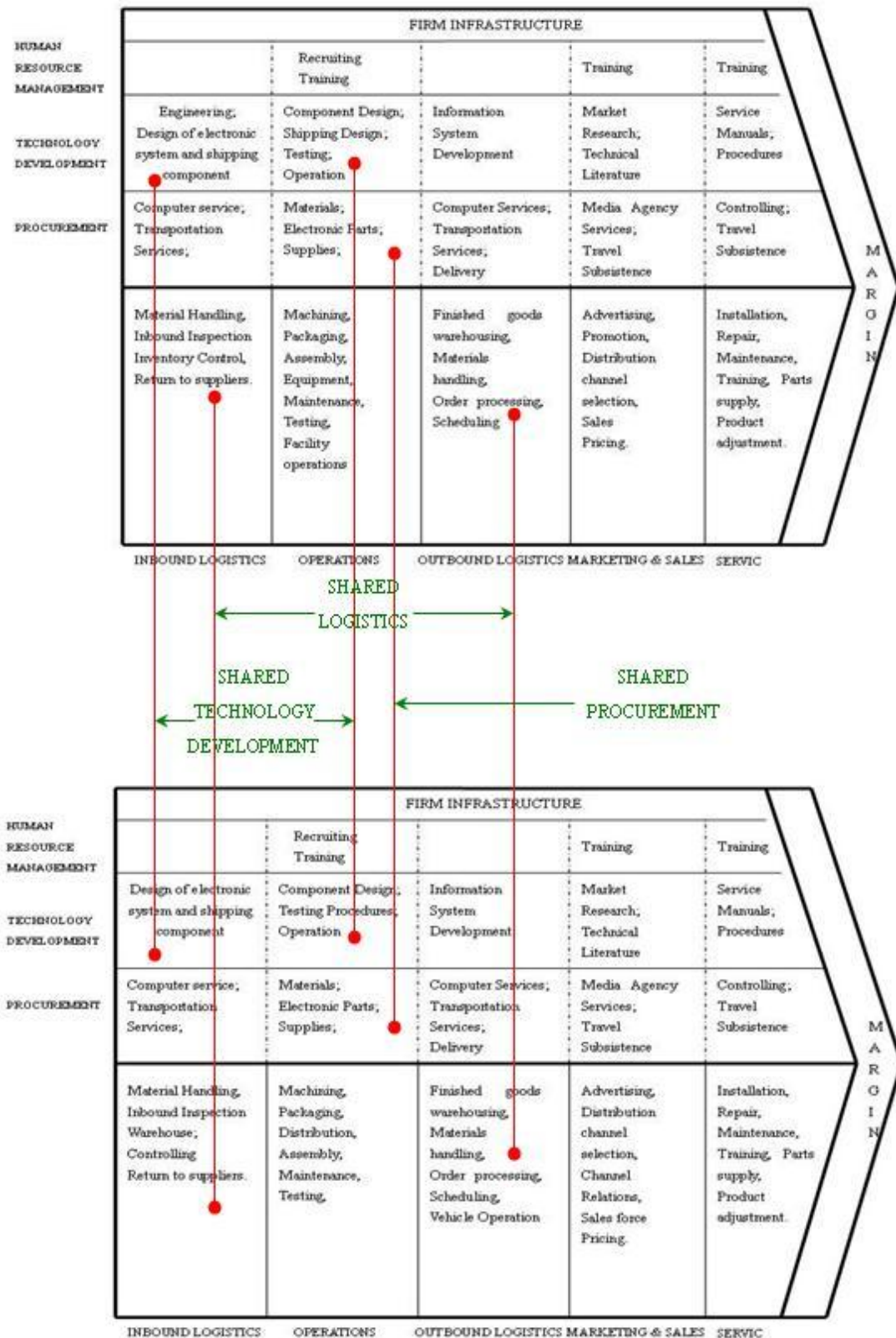
### **6.2.1 Interrelationships between Different Value Chains**

Interrelationships among all activities can have a powerful influence on competitive advantage, either by lowering cost or enhancing differentiation. As strategic planning's theory and practices have been developed, Ulstein Group has come to recognize that UEL and UME can employ the coordination strategy. Two companies are located in two different countries, Norway and China. Such a situation maybe causes geographic interrelationships, which can enhance competitive advantage if sharing or coordinating value activities lowers cost or enhances differentiation. For example through sharing supplier information and supporting, UEL can try to find some possible international suppliers to lower its purchasing costs. And on the other side, through sharing technology and engineering, UME can use its lower labor cost to create differentiation to satisfy various customers' needs. In addition, a shared logistical system may allow both firms to reap economies of scale, for example, while a shared sales force offering related products can improve the salesperson's effectiveness with the buyer and thereby enhance differentiation.

#### **6.2.1.1 Tangible Interrelationships**

The value chain provides the starting point for the analysis of tangible interrelationships. Including both primary activities and supporting activities, UEL's business unit can potentially share any value activity with UME's business unit, and vice versa. That is, tangible interrelationships between two business units can involve one or many value activities. The interrelationships are shown schematically in Figure 17. Sharing a value activity will lead to a significant cost advantage, such as shared logistics. UEL and UME have their own specific geographic locations, located in Ulsteinvik, Norway and Ningbo, China respectively, transportation cost becomes an important part. If UEL wants to find some suppliers in Chinese market, the personnel of UEL should be sent to China in order to investigate the market, contact suppliers and control the total process of transportation from China to Norway. Because of the higher labor cost in Norway, it is not wise to do so.

### UEL's Value Chain



### UME's Value Chain

Figure 17: Interrelationships between Different Value Chains

If UEL shares transportation with UME, UME can assign people to take charge of this problem. Since people in UME are familiar with Chinese market and it has relatively lower labor cost, a lot of transportation cost can be saved in the way of shared logistics. Basically the product transportation from China to Norway uses sea transportation. Some raw materials, electrical components and finished products are first sent to Ningbo Port, shipped to Hamburg and finally arrived either Aalesund Port or Kristiansand Port and then transferred to Ulsteinvik. Usually it takes 30 to 35 days for transportation from China to Norway. In the case of urgent cases, aviation transportation will be used but it costs expensive.

Another example of shared logistics is considering about the difference of high-end products and low-end products. High-end products produced in UEL have higher prices and relative fewer demands. Hence logistic cost does not take large proportion relative to selling high-end products. On the contrary, low-end products have lower prices and relative larger market demands. Nowadays China has become a logistic distributing center in all over the world, however, low-end products will be produced in UME so that it will provide a convenient and fast method to transport these products. Besides, these low-end components are necessary parts for producing high-end products. Therefore, a great deal of logistic costs can be saved if the coordination strategy of shared logistics will be used between UEL and UME.

In the case of sharing engineering in shared technology development can enhance differentiation and lower costs. UEL has high technology level and rapid engineering development in shipping design industry. It always gives engineering support to UME. Hence, engineer in UME have chance to enhance their competence and create new product designs so that diversified products design can satisfy customers' needs both for Norway and China. The cost for UME for borrowing an experienced engineer from her sister company UEL should be lower than to do so from other companies. Besides, product differentiation will provides more profits for both companies than the cost using for sharing engineering, which including engineers traveling cost and management cost etc.

In the case of shared procurement mainly help UEL to find some possible suppliers in China in order to lower purchasing costs. For example, a manufacture Moxa offers world-class industrial networking products to systems integrators in all over the world. EDS-

518A is a powerful switch for forming a gigabit backbone that provides faster network communication. The original unit price (w.VAT) of EDS-518A is NOK11810. UEL can get a discount. While order quantity is less than 25 pieces, the price (w.VAT) is NOK9357; while UEL order 100 pieces at one order time, the price (w.VAT) can reduce to NOK 8244. This price will be used as a reference in the subsequent calculation. Since Moxa is a global manufacture, it also has companies in China and provides the same type of switch with the same quality but at lower price. UME is one of the customers of Moxa, it can help UEL to buy such kind of switch and then export to Norway. Because the freight of sea transportation from China to Norway uses US dollar, the exchange rate should depend on the date of exchange rate. Hence, the exchange rate of the transaction date shows in the following Table 8.

Exchange Rate		3. April
RMB	NOK	USD
¥ 100.00	kr 97.41	US\$14.63
	kr 100.00	US\$15.27

Table 8: Exchange Rate

Appendix D lists the detailed information of unit price of the switch EDS-518A in Chinese market, and its relevant value added tax, insurance amount, domestic cost, freight of sea transportation and handling cost and so on. Hence, the unit price of the export to Norway can be calculated in the following way.

1) Actual cost

$$\begin{aligned}
 &= \text{sourcing price per unit (w.VAT)} / (1 + \text{value added tax}) \\
 &+ (\text{value added tax} - \text{tax refund rate}) * \text{sourcing price per unit (w.VAT)} / (1 + \text{value added tax}) \\
 &= \frac{8500}{1+17\%} + \frac{8500}{1+17\%} * (17\% - 17\%) = \text{RMB}7265
 \end{aligned}$$

2) Due to UEL and UME are sister companies, there is no exporting margin cost here.

3) Domestic cost

$$\begin{aligned}
 &= \text{customer clearance charge} + \text{carrier document fee} + \text{booking fee} + \text{terminal handling charge via APL} + \text{trucking fee from Zhenhai} \\
 &= 100 + 125 + 400 + 460 + 550 = \text{RMB}1635
 \end{aligned}$$

Because the unit price is calculated here, 20'GP container can place 150 piece of such kind of switch. Hence, domestic cost per unit = 1635/150 = RMB11.

4) Foreign cost

$$\begin{aligned} &= \text{sea transportation freight} + \text{import handling} + \text{custom clearance} + \text{terminal handling} \\ &\text{charge} + \text{international ship and port facility security fee} + \text{delivery fee to Flekkefjord} \\ &= 550 + 150 + 75 + 190 + 49 + 850 = \text{US1864} \end{aligned}$$

5) Freight per unit

$$\begin{aligned} &= \text{exchange rate} * \text{foreign cost} / \text{Qty in 20'GP container} \\ &= 6.8353 * \frac{1864}{150} = \text{RMB85} \end{aligned}$$

6) Insurance =  $1 / (1 - \text{insured amount} * \text{insurance rate})$

$$\begin{aligned} &= 1 / (1 - 110\% \text{ base on goods value} * 0.12\%) \\ &= 0.99868 \end{aligned}$$

Therefore, the export unit price to UEL

$$\begin{aligned} &= (\text{Actual cost} + \text{exporting margin} + \text{domestic cost per unit} + \text{Freight per unit}) \\ &\quad / \text{Insurance} \\ &= \frac{7265 + 0 + 11 + 85}{0.99868} = \text{RMB7370.73} \end{aligned}$$

That is, the export unit price to Norway is RMB7370.73.

$$\frac{7370.73}{6.8353} = \text{USD1078}$$

According to the exchange rate, NOK:USD is equal to 100:15.27 on 3. April.

$$\text{The export unit price convert to Norwegian kroner: } 1078 * \frac{100}{15.27} = \text{NOK7062}$$

Ulstein Norway Current Price	kr 8,244
Export to Norway Ulstein Price	kr 7,062
Cost Saving / Pc	kr 1,182

Table 9: Cost Saving

Obviously, buying each switch EDS-518 from China can save NOK1182, the rather that the switch is essential component to produce high technology products in UEL. The more quantities will buy from the Chinese market, the more purchasing cost will be saved by UEL. Therefore, it is benefit for UEL to use the same supplier with UME for purchasing this kind of electrical component. In the situation of shared procurement, UME will be in charge of the purchasing processes in China. Since the personnel in UME are familiar with

Chinese market, it can help UEL to reduce the work burden and difficulties and further to increase work efficiency in the Chinese market.

### **6.2.1.2 Intangible Interrelationships**

Intangible interrelationships involve the transference of management know-how among different value chains between UEL and UME. For example, order system used in UEL is an ERP system. UEL will send professionals to help UME build the same order system. And UME shall implement the ERP system in China during 2009.

Another example is building the common supplier database. UEL has about 330 suppliers today and UME has fewer. All information of these suppliers are collected and deposited in the database. If both firms share supplier information with each other, UME can understand more suppliers' information concerning company background, product description, function and order conditions in order to help the company to explore and expand its supplier market. On the other hand, UEL can use the database to find more suitable suppliers in the Chinese market. Further, if both companies want to use the joint suppliers, the database will offer a good inquiry instrument to help them decide whether the common supplier will meet the both companies' requirements, in terms of product quality, price, delivery time, payment conditions and so on.

Technology transferring is also a method of transference of management know-how. Since UEL has experienced product designing and high technology level, it often gives UME a hand in engineering, designing, and installation. Hence, through such transference of management know-how can help the new company UME use such technology to produce and develop its own products, quickly enhance its competitive advantage in the local market, and strive for more customers in the competitive market.

### **6.2.2 Coordination and Cost**

The advantage of coordination of two different value chains between UEL and UME is to lower cost and enhance differentiation which has presented in the previous sections. At the same time, coordination always involves costs, because they require business units to modify their behavior in some ways. The costs of sharing a value activity can be divided into three types.

The first one is coordination cost. Usually coordination involves costs in term of time, personnel and money. For example, joint procurements between UEL and UME can be achieved by frequent communications. Since the aim for both companies is to use same suppliers in the Chinese market, the purchasing manager in UME should find and communicate with suitable suppliers and then send the information about electric product's price, quality, and delivery time etc to both managing director in UME and logistic manager in UEL. Through the communication and discussion between them, they will decide the type of products should be purchased from which supplier in order to ensure the quantity and quality of a purchased input required by each firm. Therefore, communications between purchasing manager with suppliers and between managers in both companies take a lot of time, manpower and money. These costs can be considered as coordination cost. Another example is that after UEL has purchased electrical products in Chinese market, the logistic manager in UME should arrange and control all these purchased products will be safely transported to Norway. Therefore, shared logistics will cause cost of coordination as well.

The second is compromise cost. Since UEL and UME aim to use same suppliers and purchase electrical components from them, the design of the components maybe cannot strictly match one company's need, because the component will satisfy another company's requirement as well. Besides, to the requirement of the product's quality and price, there are differences between two companies. One side UEL focuses on purchasing high quality electrical components to produce high technology products based on the differentiation strategy in order to satisfy various customers' demands. For these high-end products with high technique-scale, the price is not very important. On the other side, UME is using cost leadership strategy to produce standardized products with no technique-scale. The price of the purchased product comes first, which comparing with quality. Therefore, the supplier selection and its product selection become crucial in terms of product quality, price, design, function, delivery time and service. Any difference of criteria and notion among these products' characteristics between UEL and UME will cause compromise cost.

The third one is inflexibility cost. UEL sharing activities with UME will raise the difficulty to respond quickly to competitors in local market, because countering a threat of UEL may undermine and reduce the value of the interrelationships for activities of UME. Further, sharing makes UEL and UME enhance their competitive advantages, and build a faithful



relationship between both companies. Sharing will raise the difficulty to exit, if UEL or UME wants to exit the existent market, it will harm the other party who sharing an activity with it. The inflexibility cost depends on the possibility of the need to respond or exit.

Consequently, coordination of two different value chains between UEL and UME will bring some benefits to reduce cost and enhance differentiation, but some problems, such as costs of coordination, compromise or inflexibility, will be occurred at the same time. Hence both sides, benefit and disadvantage, should be weighed by both companies, and then to decide whether implementing the joint suppliers for both companies.

### **6.3 Supplier Selection**

There is a linkage between a firm's value chain and the value chains of suppliers. A firm's activities are performed affects the cost or performance of suppliers' activities and vice versa. The research paper is mainly introducing of purchasing electrical components by UEL and UME, hence, the range of supplier selection will be reduced and focused on some international manufacturers. For example, PHOENIX CONTACT is a leading developer and manufacturer of industrial electrical and electronic technology and it offers diverse product, components and system solutions for industrial and device connection, automation, electronic interface and surge protection. SCHNEIDER ELECTRIC provides the excellent level of quality, safety, benefits and services associated with the solutions. As mentioned before, these two suppliers are global manufacturers and provide electrical components to both UEL and UME.

#### **6.3.1 Portfolio Matrix Analysis**

According to the Figure 6 the Kraljic portfolio matrix, electrical components such as starters, breakers and switches can be considered as leverage products. There are many possibilities and incentives for UEL and UME to negotiate with different suppliers to purchase leverage products. Hence it will lead to a low supplier switching costs. And then a lower supplier risk will be occurred correspondingly. On the other side, this is a buy-dominated segment. Two buyers UEL and UME have high spending power and they have capable to reduce prices and to push for preferential treatment. Besides, leverage products have a relatively strong profit impact, since small percentages of cost saving usually involve large sums of money.

In the case of this paper, UME buys different kinds of electrical starters and breakers (leverage products) from Schneider Electric and Phoenix Contact, the price list is shown in the Appendix C. Through negotiation with suppliers, UME has got different discount levels based on original prices of components. But these electrical components are made in China. If UEL can use the same starters and breakers to produce its high-end products, a lot of purchasing cost will be saved, since average price of purchasing electrical component in the Norwegian market is much higher than it is in the Chinese market, the range is usually from 10% to 40%. But before the bulk purchase, UEL must do a series of tests to understand products' functions and testify whether these starters and breakers come from China can satisfy the requirements of producing high-end products. Hence, doing such tests will cause some relevant costs in terms of time, manpower and money. However, if these purchased components can not accurately meet UEL's need, some compromise costs will raise. One side, UEL can revise their products' design because of huge temptation of cost saving. On the other side, UEL will give up the purchasing planning based on the expensive and complicated design modification. But in the long-term interests, if these Chinese starters and breakers can meet the focal company's requirements, it will bring a huge purchasing cost saving, and generate a lot of benefit to UEL.

### **6.3.2 Managing Strategic Partnership with Suppliers**

According to the research problem, this paper should focus on the common suppliers of UEL and UME, Schneider Electric and Phoenix Contact. UEL has a strong relationship with them, since they share product's information and knowledge, focus on product development, quality control, delivery, reliability, mutual trust and mutual commitment, hence they usually find out good solutions for existent problems in order to maintain and develop partnership between them. Therefore, 'develop a strategic partnership' can be assigned to UEL as the purchasing strategy.

Because the prices for the same electronic starters and breakers provide by suppliers Schneider Electric and Phoenix Contact are much higher in Norwegian market than they are in the Chinese market, UEL wants to turn its steps to Chinese market for purchasing these kinds of electronic components at lower prices. That is, UEL is considering using the same supplier with UME, large order quantities should be purchased by UME and then export to UEL. But if UEL do this decision, is it possible for the focal company to

maintain the originally strong relationship with its suppliers? UEL reduces a part of bargaining power towards its suppliers, which means UEL will lose contact with them, lose some chances for product and technology development, lose the knowledge for developing high-end products, and lose supplier's loyalty and so on. In other words, the compromise cost will increase correspondingly. For example, suppliers will adjust the discount of providing their products to UEL, and hence the focal company maybe cannot receive the same large discount as before. That is, the purchasing price of buying products from Schneider Electric and Phoenix Contact will be increased. In addition, the delivery time maybe has some changes. To an allegiant customer who orders different kinds of products with large quantities, the supplier will afford outstanding service which including giving lower price and delivering purchased products as soon as possible. If UEL reduces buying power towards its suppliers, the delivery time maybe becomes longer than before. The consequence is that one side the purchasing price is reducing sharply at UEL, but on the other side the compromise cost is increasing.

As a new developing company, UME uses cost leadership strategy to find suitable suppliers in the Chinese market. Since the focal company wants to use the same supplier with UME, the coordination strategy forces UME to apply the same purchasing strategy 'develop a strategic partnership' with the focal company UEL. Such a situation generates a question, is it possible for the company UME to use this kind of purchasing strategy? From the current market situation, UME has established good relationships with Schneider Electric and Phoenix Contact in China, since they have information exchanges and share little product developments. According to Appendix C, UME has got 53% discount to its most expensive electrical starter and delivery time of Schneider Electric is only 3 days and delivery times of Phoenix Contact vary from 3 to 10 days. Hence, UME is using 'develop a strategic partnership', the same purchasing strategy with UEL. This type of cooperative strategy is pursued when the supplier is willing and has the capability to contribute to UME's competitive advantage. Therefore, UME is searching for a more strategic partnership with its suppliers Schneider Electric and Phoenix Contact. Building a long-term strategic partnership is considered by UME. Supplier will offer a greater variety of electrical components at lower prices and short delivery times, which will bring benefits to both companies. To the focal company, UEL may find out more suitable components in the Chinese market to substitute the expensive ones in the Norwegian market in order to produce high-end products. To UME, it can gradually enhance its bargaining power with

its suppliers, and improve product quality, reliability, lead time and further lead to cost reduction.

However, after many years, companies will give evaluations to their suppliers. UME, as a cost leadership company, may find alternative suppliers to replace current ones. The new supplier maybe cannot provide the qualified electrical components to meet the focal company's requirement, and hence the coordination strategy between two companies will be broken. In order to avoid such a situation happening, two companies should contract an agreement concerning the coordination form, length, rule and responsibility etc before coordination is executed. This would also help to protect the interests of both companies.

### **6.3.3 Criteria of Supplier Selection**

When UEL selects suitable suppliers, the following criteria shall be taken into consideration. The first one is quality. How is the required quality met by offer? Because UEL has agile value chain with differentiation strategy, high quality components must be used to produce high-end products in order to serve in the high technology-scale markets. The second one is delivery time. It prefers to find the suppliers with quick delivery. The third one is cost. How many costs of engineering, installation, transportation and initial costs and so on? But to a high quality producing company, the cost is not very important. On the other side, the criteria of UME to choose suppliers based on price, delivery time and payment condition. In such a situation, cost takes a large proportion, since UME has lean value chain with cost leadership strategy. It produces low-end products to meet large market demands.

There is some difference of criteria of supplier selection between UEL and UME, quality goes first for UEL while cost is primary for UME. How to coordinate these criteria becomes one of the important problems to show whether both companies can use same suppliers in the Chinese market. There is the best market situation. The joint suppliers, Schneider Electric and Phoenix Contact, will provide the qualified components to satisfy both companies' requirements based on the quality and price. If the deviation appears, a dilemma situation will be occurred. And hence, compromise costs will be raised correspondingly, if two companies are persisting in using joint suppliers. High quality products bring higher product prices. If these high quality products are not necessary used by UME to produce low-end products, is UME willing to buy such kinds of products at

higher price? On the other side, if the electrical components provided at lower price but cannot meet UEL's demand, is it possible for the focal company to modify its products' design? Therefore, mutual communications become significant in such a situation. They should find out a good solution to solve the dilemma or look for alternative suppliers who can meet the needs of both companies.

According to the procurement process, companies should evaluate their suppliers after a period of time. Even if the two companies use the same suppliers now, some problems and conflicts maybe occur at that time point. For example, UME will search another supplier, which gives cheaper price than current suppliers, and also provides qualified electronic product satisfied all requirements of UME. But this supplier maybe cannot meet the quality requirements of UEL. Another example is that since UEL applies differentiation strategy, it is willing to buy more high quality electrical products from its suppliers. But UME applies cost leadership strategy, it is not necessary to buy products had same quality level with UEL. Consequently, these real problems will appear in the near future due to UEL and UME have different supplier selection criteria. Before the decision of using same suppliers in China taken by UEL and UME, it is better for both companies to think much about this problem and sign up an agreement at the beginning in order to avoid such types of conflicts happening in the future.

#### **6.3.4 The Buyer-Supplier Relationships**

All the activities within the firm and the relationship between the firm and its suppliers constitute partial transaction cost. Before UEL decides which supplier will be used, it will contact with the supplier, and understand the quality, price, capability, delivery time, payment condition of the product. Then the necessary investigating analyzing and evaluating of such a product should be processed. Finally, UEL will determine whether the supplier is suitable for the company. If it is possible, preparing the contract, determining the buying quality, delivery time etc procedures should be considered. After deciding the appropriate supplier, UEL will find the transportation company to transfer the product, and then installation, testing, and applying etc processes will be managed. All kinds of costs caused by these activities are included by the term of transaction costs. In the same way, when UME tries to find out the suitable supplier to provide the electronic products, the similar transaction costs are occurred. That means, if UEL and UME use different suppliers in its local market, most steps in the purchasing process are same for both

companies. If two companies want to use the same suppliers in the Chinese market, the relevant terms of transaction costs will be reduced correspondingly.

As mentioned before, UME has a good relationship with Schneider Electric and Phoenix Contact. The information exchange and sharing product development can be considered as transaction specific assets, since they are dedicated to a particular relationship with its suppliers and cannot be redeployed easily. Besides, after many rounds of trading, the company and its suppliers have got better understanding with each other. Mutual trust and mutual commitment are gradually building. According to the Figure 9, a situation, both the transaction specific assets are high for UME and its suppliers and uncertainty is lower for both parties, can be employed a long-term contract. Hence, a close and lasting cooperation between UME and its suppliers will improve product quality, delivery time, reliability and it will lead to cost reduction. It will also lead to advantage to both companies if UEL and UME apply a coordination strategy with joint suppliers. The improvement of product quality leads to UEL has opportunity to enhance product's differentiation. And cost reduction make UME to produce more standardized products to serve in the large market demands. Moreover, good cooperations with suppliers can make companies and their suppliers perform their effectively respective roles in the competitive market. That is, suppliers will provide qualified products to UEL and UME, and at the same time, two companies will focus on develop their own core activities. Therefore, with strategic partnership with suppliers, two companies will achieve their benefits faster, at less cost, and with higher flexibility and less risk.

On the other hand, if UEL and UME employ joint suppliers at network, the buyer's bargaining power will increase because UME will order large quantities from its suppliers in the Chinese market. Further, they purchase leverage products in the market, which can be considered as a buyer dominant segment. The suppliers' dependences on the buyer are sources of buyer power. Therefore, two companies should keep joint buying processes with a handful of suppliers, and it will increase purchasing bargaining power in order to generate supplier competition. Such benign supplier competition may lead to a stronger bargaining power in purchasing and then lower its relevant costs.

At the beginning of the analysis section, the concrete activities of different value chains have been introduced. And then the coordination of two different value chains is outlined, which includes tangible interrelationships, intangible interrelationships, managing strategic partnership with suppliers, supplier selection criteria and so on. If two companies UEL and UME want to use the same suppliers at the network, some benefits and disadvantages are concerned in this section. UME will be in charge of the purchasing process in China, and it will order larger quantities from joint suppliers, Schneider Electric and Phoenix Contact, and then export to Norway. One example given in the paper to show that the unit price of purchasing switch EDS-518A in Chinese market is much lower than it is bought in the Norwegian market. That is, if UEL use the same suppliers with UME in the Chinese market, a lot of purchasing cost will be saved. But at the same time, such a coordination strategy will lead to coordination cost, compromise cost and inflexibility cost. Therefore, two companies UEL and UME should pay more attention to this coordination strategy. They should weigh and compare the beneficial side and disadvantageous side based on the idea and principle of both companies. Through analysis and discussion between both companies, they should make a decision whether it is possible to use the same supplier at network for UEL and UME. At last, drawing on TCA and RDT effective coordination of buyer-supplier relationship is an important determinant of firms' competitiveness under changing market conditions.

## **7. DISCUSSION**

The discussion part has outspreaded depending on the analysis section. And it brings a number of practical problems into this part, which including feeble Chinese shipping industry under financial crisis and different governance forms for using joint suppliers between two companies.

### **7.1 Chinese Shipping Industry under Financial Crisis**

China has advantage to produce low-end products, such as low technology level, mass production, high volume, and high weight products, in the low-end markets. Hence purchasing such kinds of electrical components of UEL will be reasonable bought in China. Because it has lower raw materials costs and correspondingly lower transportation cost depends on the developed traffic conditions in China. For example, Ningbo Port and Shanghai Port are two important ports and it is convenient to ship containers abroad. Besides, road transportation and railway transportation almost can reach anywhere in the domestic market. Wherever the suppliers located, purchased products could be delivered to UME in time and then transport to UEL as soon as possible. In addition, air transportation is feasible for transporting small size and high-precision products in case of the urgent project of UEL. But the sea transportation is one of the most commonly used methods.

During the last half year, the world financial crisis brings a great impact to the international economy development. Such an impact inevitably affected the pace of China's economy. Shipping industry is the first one of the affected businesses. In accordance with French maritime transport statistics, as of December 21, 2008, there are 165 container ships idled in global, and tolls of anchorage, ship maintenance, crew settlement and loans of purchasing boats form serious problems to ship owners (Shipping China Internet, 2009). According to integrated international Baltic freight index (BDI), it reduces from the highest point 11793 in 2008 to point 600. Further, the rent of ship is breaking down, which has the same situation with the BDI index. The shipping industry which brings high profit to ship owners in the previous time now is turning into a pile of junk metal. In addition, experts say it is just the beginning, the U.S. economist Professor Krugman, the 2008 Nobel Laureate in Economics, predicted that the world economy will into recession until 2011 year.



The shipping industry in China is a typical cyclical industry. It can roughly be divided into three major transportation markets, shipping container transport, dry bulk cargo transport and oil transport. The electrical components purchased by UEL can be considered as terminal consumer goods, which should be transported by shipping container. However, the market of the shipping container transport becomes the first which gets large impact under the financial crisis. The volume of international logistics operations have significantly reduced. Especially the routes of Europe and the United States have seriously affected, the volume reduces and the freight rates fall down. In addition, except the idle ship, the space utilization of current using ship is not high. An average space utilization rate of the current European routes remains in the level of 70% to 80%, and the Mediterranean route is also around 70%. This shows that container loads consumer goods, which has a more direct and rapid response to the economic and trade changes. Once the economy faces the negative impact, the transport price and cargo volume will be substantially reduced.

Obviously it gives UEL a good chance to use shipping container transport to ship its purchased products from Chinese market. According to document given from the logistics manger of UEL, one container shipped from China to Norway is approximately US5000 during 2008. However, a documentation of sea freight in March 2009 shows that the freight has been reduced sharply (see Appendix E). Since the container shipped to Kristiansand Port should be charged to Flekkefjord, it has higher sea freight than shipped to Aalesund Port. Besides, handling 40HQ container costs most expansive. Hence taking the route from Ningbo Port to Kristiansand Port and 40HQ container as references, through rough calculation the sea freight just reaches US3000. Compare with the data during 2008, the sea freight has reduced about 40% when one container shipped from China to Norway. Therefore, under this special time period financial crisis, it is advantageous for UEL to buy the electrical components in the Chinese market. If UEL can use the same suppliers with UME, it will bring the best result since joint procurement processes and feeble shipping industry will lead to lower purchasing cost and transportation cost for UEL.

However, a coordination strategy between two companies should not be absorbed in immediate interests. Maybe the financial crisis will last for many years. But one day in the further, the crisis will be over, and the Chinese shipping industry will recover afterwards.

The sea freight will increase correspondingly. Maybe the freight for shipping one container from China to Norway will go back to US5000, or more expensive than this price. But no doubt that purchasing in the Chinese market will save a lot of purchasing cost for the focal company UEL.

## 7.2 Different Type of Governance Forms

Because of the geographic advantage and communication predominance, UME will be in charge of the purchasing processes if UEL is willing to use the same supplier with UME in the Chinese market. That is, UME has responsibility for finding the suitable supplier, contacting supplier with detailed product information, signing up the contract, determining the order quantity etc. Hence, there are two possible governance forms at the network of using joint supplier for two different companies.

One of the governance forms is that UME will order large quantities from the supplier in China.

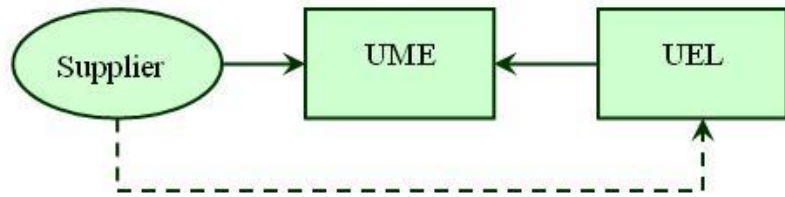


*Figure 18: Governance Form*

All of the purchased products will be

delivered to UME first, and then partial products purchased by UEL will further be exported to Norway (see Figure 18). However, this kind of governance form will cause the stock problem of UME. At the moment, the stock value of UME is around NOK500000. UME keeps materials for approximately 5 complete units of its most common products, which is done in order quick response to its customers, in case they place an urgent purchase order for their products. According to Appendix C, although the delivery time of suppliers of UME is short, 3 days of Schneider Electric and 3 to 10 days of Phoenix Contact depend on different types of products, it will take probably 30 to 35 days to ship the purchased product to Norway. Based on the fixed sailing date, the large quantity of purchased products should be kept by UME before they will be transported. Obviously, the inventory cost of UME will increase suddenly. Besides, UME will use extra time, manpower and cost to transport and stock these purchased products. Maybe this is not a good governance form for using joint supplier at network for both companies.

The other governance form is that because UEL is currently using ERP order system, UME will clearly understand the order situations of UEL in the following



*Figure 19: Governance Form*

months. UME will decide the order quantity and give the assured order number to its suppliers in China, for example in each order time how many products will be ordered by UME and how many ones will be ordered by UEL. In this governance form, the transportation task will be in charge of by the local supplier. Parts of purchased products will be shipped to UEL directly by the supplier and other purchased products will be transported to UME (see Figure 19). Since the joint suppliers used by both companies are international manufacturers, Schneider Electric and Phoenix Contact have a lot of export experiences. If UEL orders larger quantities, it can use a unitary container for transportation. Otherwise, it is possible to share a container with other kinds of products to ship to Norway. Therefore, this kind of governance form is suggested by the author, since it is feasible for UEL and UME to use joint suppliers in China.

## 8. CONCLUSIONS

The focal company UEL has agile supply chain with differentiation strategy and produces high-end products in order to meet customers' various demands in the high-end market. UME, as one of the suppliers of UEL, has lean supply chain with cost leadership strategy and produces low-end products in the low-end market. The main subject of this research paper is to investigate the coordination between different value chains, which includes tangible interrelationships, intangible interrelationships, managing strategic partnership with joint suppliers, and criteria coordination of supplier selection and so on. Besides, the coordination strategy applied by both companies brings both beneficial and disadvantageous sides, the following tables will give the summaries in order to show the primary research problem: if it is possible to use the same supplier at network for both companies.

	Shared Forms	UEL	
		Pro	Con
<i>Tangible Interrelationships</i>	Shared Logistics	saving transportation cost	coordination cost
		saving manpower	
	Shared Engineering	enhance differentiation	coordination cost
	Shared procurement	lower purchasing cost	coordination cost
<i>Intangible Interrelationships</i>	Shared order system	understand order situation	coordination cost
	Common supplier database	expand supplier market in China	coordination cost
	Technology transferring	enhance technology level	coordination cost
<i>Coordination</i>	Good relationship with UME	using coordination strategy	inflexibility cost
<i>Joint Supplier</i>	Buy leverage products (electrical components)	reduce purchasing cost	compromise cost
		increase bargaining power	cost: do test before buying
	Partnership purchasing strategy	reduce purchasing cost	compromise cost
		short delivery time	break relationship with current suppliers
		find more replaceable components in Chinese market	increase purchasing price and delivery time with current suppliers
		information exchange with supplier	
		product development	
		technology development	
		mutual trust	
		increase bargaining power	
	improve quality		
Criteria coordination		compromise cost	
Buy-supplier relationship	reduce transaction cost		
	increase bargaining power		

Table 10: Summary of UEL

	Shared Forms	UME	
		Pro	Con
<i>Tangible Interrelationships</i>	Shared Logistics		coordination cost
	Shared Engineering	enhance design level	coordination cost
		enhance differentiation	
Shared procurement	lower purchasing cost	coordination cost	
<i>Intangible Interrelationships</i>	Shared order system	understand order situation	
	Common supplier database	expand supplier market	coordination cost
	Technology transferring	enhance engineering level	coordination cost
enhance technology level			
<i>Coordination</i>	Good relationship with UEL	using coordination strategy	inflexibility cost
<i>Joint Supplier</i>	Buy leverage products (electrical components)	reduce purchasing cost	compromise cost
		increase bargaining power	
	Partnership purchasing strategy	reduce purchasing cost	compromise cost
		short delivery time	
		increase bargaining power	
		technology development	
		information exchange with supplier	
		product development	
		improve quality	
	mutual trust		
Criteria coordination		compromise cost	
Buy-supplier relationship	reduce transaction cost		
	increase bargaining power		

Table 11: Summary of UME

As seen both tables, Table 10 and Table 11, beneficial sides for using joint suppliers focus on reducing purchasing cost and increasing bargaining power. Shared procurement is an important method to reach lower purchasing cost, since it provides opportunity for UEL to find alternative suppliers who provide replaceable electrical components at lower price in Chinese market and it gives chance for the focal company to use the same suppliers with UME at network. Besides, due to a lower raw material cost, labor cost and sea freight, the unit price of electrical components provided in the Chinese market is much lower than it is provided in the Norwegian market. An example has been given to prove this point in the analysis section. On the other hand, since electrical components can be considered as leverage products, there are many possibilities and incentives for UEL and UME to negotiate with different suppliers. Hence they have high spending powers and capable to reduce prices and to push for preferential treatment. If two companies use the joint suppliers, a large of electrical breakers and starters will be ordered from Schneider Electric and Phoenix Contact. The buyer's bargaining power will increase. Moreover, companies will gradually establish good relationships with suppliers through buying transactions,

bargaining power will be enhanced, and then product quality, delivery time, reliability will be improved correspondingly.

The disadvantages focus on coordination costs and compromise costs. Coordination costs often occurred in shared procurement and shared logistics in terms of time, personnel and money. The compromise costs mainly focus on competitive strategies and supplier selection criteria of both companies. The focal company UEL uses differentiation strategy, the product quality comes first. However, UME uses cost leadership strategy, the cost take large proportion when it selects suppliers. In addition, based on the procurement process, companies should evaluate their suppliers after a period time. Since the term of compromise will arise some problems and conflicts, it would be the best for UEL and UME to contract an agreement before they decide to use joint suppliers.

Both beneficial sides and disadvantageous sides have their own weights according to different ideas and principles of two companies. Hence, the managers of both companies should pay more attention to analysis, discuss and compare these sides, and give weights to each item. Finally, through the comparison the weights of both positive and negative sides, the managers should determine which side they give more attentions, and then make a decision whether it is possible to use the same supplier at network for UEL and UME in order to solve the primary research problem in this paper.

At last part of the research paper, two different governance forms have been introduced. Two forms have their own features. Based on the real situation of each company, managers should carefully apply any of them in order to control their procurement processes, improve work efficiencies, enhance competitive advantages, and lower stock situations.

## **9. LIMITATIONS AND FURTHER RESEARCH**

In this research paper, I have explored and discussed the benefit and disadvantage of coordination between two different value chains. Due to the limitation of access to information, I cannot give a definite conclusion about whether it is possible to use the same supplier at network. I just can provide a suggestion.

Initially I aim to collect more supplier information concerning suppliers' background, products' detailed information, supplier relationships and competitors. Because UME is a new set-up company, there is no history and financial reports can learn from. Therefore, the range for supplier selection is reduced to Schneider Electric and Phoenix Contact at last. Moreover, before the subject has been decided, I have travelled to China to interview the company; maybe it becomes a limitation to get more directly information in Ningbo.

Although there are some limitations in this research paper, I have done my best to analysis and discuss the thesis based on the all information I have got. Besides, some opportunities will go further with this research paper. Since China has rapid economic development and has been a strong labor market, it is a general trend to purchase raw materials in the Chinese market. Two companies, UEL and UME have great possibilities to apply a coordination strategy with joint suppliers in China. I would like to investigate how long this coordination strategy will be last. Nowadays, many Asian countries, such as India and Pakistan, have lower labor costs than China has, but they have not the same developed transport system as China has. Hence I am interested in if the economic development and labor market expanding of these countries will affect the coordination strategy with joint suppliers in the Chinese market?

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## **11. APPENDIXES**

### **Appendix A: Interview Guide of UEL**

1. What kind of supplier/buying processing UEL has today?
2. How many supplies UEL has?  
  
Who are they? What kind of raw materials they supply?  
Where are these suppliers located?  
Are there any common suppliers for both firms now?  
What is the vendor management for each supplier?
3. What is the relationship between these suppliers with company UEL?
4. How is the current buying process going on of UEL?
5. What is lead time / delivery time for each product?
6. How often should UEL need to purchase each type of products?
7. What is stock situation in UEL? (warehouse situation)
8. What is the waiting cost if they wait for supplier to send materials you have ordered?
9. What is transportation cost if you order materials in local market or foreign market?
10. What is each product's raw material cost? (related to each supplier)
11. How about the order system of UEL?
12. What are the supplier selection criteria?

## **Appendix B: Interview Guide of UME**

1. What is the relationship between UEL and UME?
2. How many types of products are producing in UME? Products list? Functions?
3. How does UME currently transport these products from Ningbo to Norway?
4. How long will it take to transport these products?
5. Does UME take the order directly from UEL or other customers?
6. Who will do the quality control? Does UME use the same standard with UEL?
7. Does the factory share engineering with UEL?
8. Who are the main competitors of UME in China?
9. What kind of supplier/buying processing UME have today?
10. How many supplies does UME have?

Who are they? What kind of raw materials they supply?

Where are these suppliers located?

Are there any common suppliers for both firms now?

What is the vendor management for each supplier?

11. What is the relationship between these suppliers with UME?
12. How is the current buying process going on of UME?
13. What is lead time / delivery time for each product?
14. How often should UME need to purchase each type of products?
15. What is stock situation in UME? (warehouse situation)
16. What is the waiting cost if UME waits for supplier to send materials?
17. What is transportation cost if UME orders materials in local market or foreign market?
18. What is each product's raw material cost? (related to each supplier)
19. How about the order system of UME?

## Appendix C: Price Lists of Electrical Components in Chinese Market

<b>schneider-electric</b>	<b>LIST PRICE incl VAT</b>	<b>DISCOUNT</b>	<b>PRICE</b>	<b>Delivery</b>	<b>Weight</b>
GV2ME01C	¥256,73	53 %	¥120,66	3days	300 G
GV2ME16C	¥265,24	53 %	¥124,66	3days	300 G
LC1D09M7C	¥99,72	52 %	¥47,87	3days	320 G
LC1D12M7C	¥108,20	52 %	¥51,94	3days	330 G
LC1D18M7C	¥136,85	52 %	¥65,69	3days	330 G
LC1D38M7C	¥246,13	52 %	¥118,14	3days	380 G
LRD01C	¥140,05	52 %	¥67,22	3days	120 G
LRD22C	¥150,65	52 %	¥72,31	3days	120 G
LRD32C	¥159,14	52 %	¥76,39	3days	120 G
XCKN2110P20C	¥51,99	48 %	¥27,03	3days	62.07 G
XCKN2108P20C	¥88,00	48 %	¥45,76	3days	62.07 G
<b>Phoenix Contact</b>	<b>LIST PRICE incl VAT</b>	<b>DISCOUNT</b>	<b>PRICE</b>	<b>Delivery</b>	<b>Weight</b>
IC-DFR 16	¥4,79	45 %	¥2,63	3~10days	3.82 G
IC-DFR 10	¥4,79	45 %	¥2,63	3~10days	2.822 G
IC-DFR 4	¥4,46	45 %	¥2,45	3~10days	1.818 G
MSTBT 2,5/2-ST	¥7,16	45 %	¥3,94	3~10days	3.703 G
IC 2.5/16-STGF-5.08	¥75,00	45 %	¥41,25	3~10days	27.732 G
IC 2.5/10-STGF-5.08	¥58,50	45 %	¥32,18	3~10days	18.36 G
UK2.5N	¥2,05	30 %	¥1,44	3days	6.358 G
UK3N	¥2,39	30 %	¥1,67	3days	7.742 G
UK5N	¥2,60	30 %	¥1,82	3days	9.25 G
UK6N	¥4,28	30 %	¥3,00	3days	13.9 G
UK10N	¥6,54	30 %	¥4,58	3days	17.38 G

## Appendix D: Price List for Switch EDS 518A

Export Price Calculation		EDS 518A:	Price: NOK8244/pr	
Abbreviate	Item	中文描述	Remark	Data
EFP	Ex Factory Price Per Unit (wVAT)	工厂交货价	Self-made products	
SP	Sourcing Price Per Unit (wVAT)	采购价格	Sourcing business	¥8,500
ER	Exchange Rate	汇率	RMB => USD	6.8353
TRR	Tax Refund Rate	退税率	Power Distribution BOX	17%
VAT	Value Added Tax	增值税		17%
EM	Exporting Margin Per PC (RMB)	出口利润 (单台) RMB		
EMR	Exporting Margin Rate	出口利润率		
IA	Insured Amount	投保金额	110% base on Goods Value	110%
IR	Insurance Rate	保险费率	Normally	0.12%
DC	Domestic Cost	国内费用		¥1,635
20'GP	Qty in 20' GP Container	20尺集装箱容量		150
Abbreviate	Qty in One Delivery	Package Size	Remark	Data
				150
Abbreviate	Domestic Cost	中文描述	Remark	Data
	Customs Clearance charge	报关费		¥100.00
	Carrier Document fee	船公司文件费		¥125.00
	Booking Fee (including EMC, Port Security)	定仓费 (包括箱管以及安保)		¥400.00
	Terminal Handling Charge via APL	船公司码头操作费 via APL		¥460.00
	Trucking Fee from Zhenhai	拖车费		¥550.00
	Packing Cost	包装成本	Only for Sourcing business	
	Transportation Cost	运输成本	Only for Sourcing business	
DC				¥1,635
Abbreviate	Freight	中文描述	Remark	Data
FRE	Ningbo Port - Kristiansand	宁波 - 克里斯迪安桑	20'GP Container / 30 days approximately	US\$550.00
	Import Handling including handling, docs, harbour fee	进口操作费		US\$150.00
	Custom clearance	目的港清关费		US\$75.00
	THC	码头操作费		US\$190.00
	ISPS	港口安全费		US\$49.00
	Delivery Fee TO Flekkefjord	弗莱克福德		US\$850.00
				US\$1,864
<b>CIP Price = (Acutal Cost +Domestic Cost +Freight + Insurance )</b>				
Formula				
	UME Product			
	Sourcing Product		<b>US\$1,078</b>	<b>kr 7,062</b>

## Appendix E: Export Sea Freight Rates for Ulstein

<b>Service Level:</b> A-Level												
<b>Commodity:</b> General												
Destination	Container	Indoor Dimension		Ocean Freight	BAF	CAF		Validity				
Alesund	20GP	5898 x 2339 x 2390 mm	USD	800.00	included	included		End of March				
Alesund	40GP	12032 x 2339 x 2390 mm	USD	1400.00	included	included		End of March				
Alesund	40HQ	12032 x 2339 x 2698 mm	USD	1500.00	included	included		End of March				
<b>Service Level:</b> A-Level												
<b>Commodity:</b> General												
Destination	Container	In door Dimension		Ocean Freight	BAF	CAF		Validity				
Kristiansand	20GP	5898 x 2339 x 2390 mm	USD	550.00	included	included		End of March				
Kristiansand	40GP	12032 x 2339 x 2390 mm	USD	900.00	included	included		End of March				
Kristiansand	40HQ	12032 x 2339 x 2698 mm	USD	1100.00	included	included		End of March				
<b>Local Charges - Ningbo</b>												
Customs Clearance charge 报关费								CNY 100.00	per b/l			
Carrier Document fee 船公司文件费								CNY 125.00	per b/l			
Booking Fee (including EMC, Port Security) 订仓费 (包括箱管以及安保)												
20GP								CNY 400.00	per Container			
40GP								CNY 500.00	per Container			
40HQ								CNY 500.00	per Container			
Terminal Handling Charge 船公司码头操作费 via APL												
20GP								CNY 460.00	per Container			
40GP								CNY 690.00	per Container			
40HQ								CNY 690.00	per Container			
Trucking Fee from Zhenhai 拖卡费												
20GP								CNY 550.00	per Container			
40GP								CNY 650.00	per Container			
40HQ								CNY 650.00	per Container			
4th and 5th Terminal Fee CNY 200 / 20GP, 300 / 40GP / 40HQ												
<b>Desitnation charges to Flekkefjord via Kristiansand</b>												
Import Handling including handling, docs, harbour fee (进口操作费)						USD 150.00	Per BL					
Custom clearance (目的港清关费)						USD 75.00	Per clearance					
THC (码头操作费)						USD 190.00	Per container					
ISPS (港口安全费)						USD 49.00	20GP					
						USD 78.00	40GP / 40HQ					
Delivery Fee TO Flekkefjord						USD 850.00	per container					
<b>Including</b>												
1 hour unloading												
Transport of standard containers and Returning of empty unit back to depot												
Fuel Surcharge												
<b>Excluding</b>												
Insurance												
Any possible storage / demurrage / detention / waiting time												
Sideloader fee												