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SEGMENTATION OF THE THIRD PARTY LOGISTICS MARKET

Based on Logistical Requirements

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ABSTRACT

In the last decade, it has become more common for companies to focus on their core product, and outsource parts of their activities that are not considered as their core competence. A service that has often been outsourced, to some extent, is the transportation of goods. The traditional transport companies have also become the major actors in the Third Party Logistics (TPL) market when companies outsource more parts of their logistical activities.

What logistical requirements do companies have when they outsource their logistical activities? Do all companies in the same industry have the same requirements regardless of their products?

This paper studies the logistical requirements of companies in different industries and structures them into segments. With the companies' different logistical requirements as a basis, we have developed a logistical segmentation of TPL customers. With the knowledge of the different logistical requirements, we have also tried to forecast the possible future development of logistical requirements.

This paper will, hopefully, give the reader a better understanding and knowledge of the TPL market, and focus on an alternative ways of segmenting the market.

Key-words: Third Party Logistics (TPL), Segmentation, Logistics, Logistical requirements, Outsourcing

ACKNOWLEDGEMENT

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Finally I, Helén, would like to thank my family for support and help during the study period and I am also grateful to my children, Hannah and Pelle, who have been very patient with their sometimes very distracted mother.

Göteborg, December 2001

Helén Lundberg Malin Schönström

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1 INTRODUCTION

In this introductory chapter, we state the problem of the thesis and also explain the background to the problem. Further, we give a description of the term third-party logistics and other terms that will be commonly used in the thesis. The purpose of the chapter is to give the readers a background that familiarises them the subject.

1.1 Thesis Background

In the last decade, the term "outsourcing" has come to be very popular amongst companies. More and more companies have understood the need to focus on their core competence, in order to be competitive on the market. They, therefore, outsource some of their non-core activities to companies that have made these particular activities into their core competence.[1] Outsourcing has also become a dominant theme in supply chain management (SCM), where logistical functions and activities often are the part of a company that is being outsourced.

The Third Party Logistics (TPL) industry has, therefore, grown to be substantially large. It is still growing and it is believed that it will continue to do so.[2] In the beginning most of the TPL providers were part of a larger company, often a traditional transport or warehousing company. Lately, there has been a growth of independent TPL players, often specialised in certain areas such as IT, consulting and financial services. Still, the majority of TPL providers, however, belong to large transport companies.

Schenker is one of these traditional road forwarders who is now also working as a TPL provider that offers their customers complete logistical solutions. The Schenker group is today a German owned company with road forwarding companies in many European countries, as well as sea, rail and flight forwarding companies for cargo transportation to countries all over the world.

1.2 Problem Background

Today Schenker groups their TPL customer into different industries depending on what kind of business they are in. Examples of industries can be the Fashion, Automotive, IT/Telecom and Chemical industries. The grouping is very general and mainly based on assumptions. The customers are grouped into these different industries and companies in the same industry are supposed to

1 Cox A. 2001, pp 8-9
2 Berglund M. 1999, p 61

have the same logistical requirements, but is this the case in reality? Are these industries a good division of companies and does this industry grouping reflect their logistical requirements? Can two companies in the same industry have different logistical requirements, or is it possible that two companies from different industries have the same requirements?

Schenker feels that they need answers to questions like these. They also desire a better understanding and knowledge of the different industries in which they are active. Their opinion is that they need more information and knowledge regarding their TPL customers' logistical requirements. In order to be better able to develop and offer good logistical solutions to their customers, Schenker realises they need more information and knowledge regarding the different logistical needs of the different industries.

1.2.1 Problem Definition

This gives us the main problem of this thesis, which as we can see, can be divided into three different sub-problems.

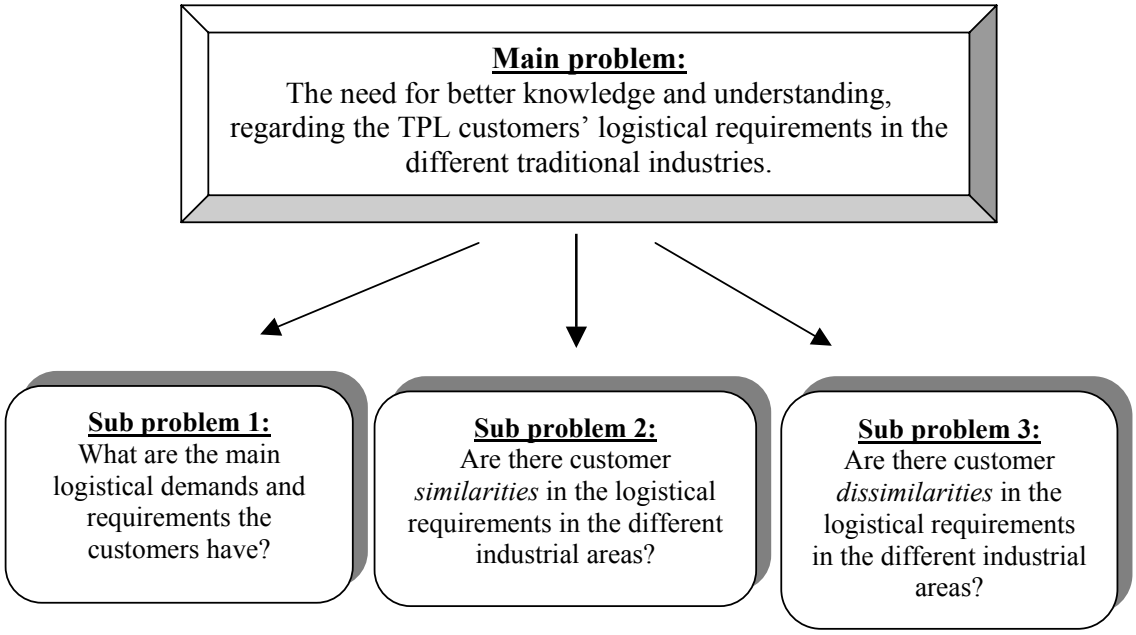

Figure 1: Mapping of the Problems

The problem will be further discussed and developed in Chapter 3 "Problem Analysis".

1.3 Purpose and Goal

The purpose of the thesis is to gain a better understanding of the different industries that exist and map the logistical requirements of the TPL customers.

The goal of this thesis is to create some kind of a tool that will help Schenker to segment their existing and potential TPL customers.

1.4 Third-Party Logistics Definitions

Even though third-party logistics (TPL) is a term that has come to be more and more widely used, there is no standard, generally accepted definition of the term. In addition, there are also other names that are used to describe the same phenomenon, *contract logistics* and *integrated service providers* for example. In our thesis we will,however, use the term TPL providers.

So what does the term Third-Party Logistics actually stand for? Since there is no standard definition we instead turn to other authors and see how they define the term. Berglund establishes the fact that the term consists of two parts; the first component is *third party* and the second is *logistics*[3].

The general meaning of third party is "a person other than the two main people concerned in an agreement, contract, law case etc."[4], and this meaning is also applicable in the case of TPL. A company acts as a middleman between the two primary participants in the supply chain and, thus, becomes a third party. The third party deals with the goods flow instead of the sender or receiver, who are parties one and two.

Figure 2: The Location of a Third-Party

The second component, *logistics,* is a widely spread and known term. A way of describing the term is as involving everything that happens from the time an article number is created until a consumer buys it. Lumsden describes this in the figure below that illustrates logistics as consisting of four different flows: physical material flow, cash flow, information flow and the flow of resources[5].

3 Berglund M. 2000, p 13 ff.
4 Longman Dictionary
5 Lumsden K. Figure adapted from notes from lecture 2000-09-01

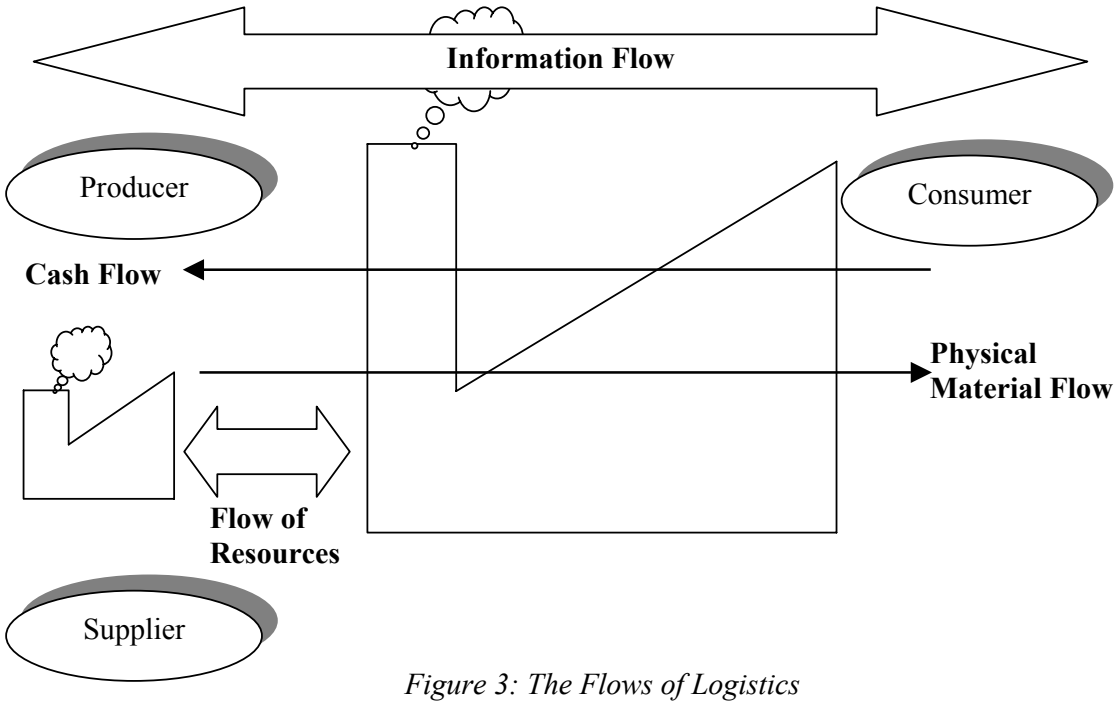

Figure 3: The Flows of Logistics
(Adapted from Lumsden)

The physical material flow can then further be divided into three different flows[6]:

- The main flow that consists of everything from raw material to the final product bought by consumers.
- The flow of spare parts or after sales service
- The reverse flow of items that once were part of the main flow (e.g. used, damaged or products out of date, packages and other waste).

Logistic can thus be said to consist of all the activities needed to enable organisation, planning, control and execution of these four different flows. This is also stated in the following definition, which is commonly used to explain the term logistics and what it includes:

> *"Logistics is that part of the supply chain process that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet the customers' requirements"*[7].

6 Berglund M. 2000 p 17
7 Council of Logistics Management 2001, www.clm1.org

When the term logistics is used in conjunction with TPL it tend to have two main interpretations, according to Berglund[8]. The first one emphasises the logistic aspect of TPL and that the term TPL only should be used when all the activities included in the term logistics are outsourced. The other interpretation is not as strict and allows contracts where only some of the logistical activities are included, to be classified as a TPL service. There is, as can be seen, no standard view on what logistics is. On the contrary, there are many and varying views of the scope of the term and it is not possible to say which of the interpretations that is right or wrong, however, it can be concluded that there is a noteworthy difference between providing single services and services containing a large range of different activities.

Hereby, we have dissected the term TPL to give a definition and description to what it is. Further we can identify some characteristics that are typical for TPL. Initially, we have the fact that TPL involves a separated entity who, without having any actual part in the supply chain, steps in as a middleman between two participants, and as a result, becomes involved as a third party. Secondly, we can see that there is a high level of integration between the TPL provider and its customers and between the functions performed. Finally, we have the common feature of TPL as being a long-term relationship that often is of a strategic kind. The two parties regard each other as partners and their goal is to create a win-win situation for both parties.

This whole discussion leads up to following definitions that, in short, describe TPL:

> *"the services offered by a middleman in the logistics channel that has specialised in providing, by contract, for a given time period, all or a considerable number of the logistical activities for other firms"*[9]

> *"Activities carried out by an external company on behalf of a shipper and consisting of at least the provision of management of multiple logistics services. These activities are offered in an integrated way, not on a stand-alone basis. The co-operation between the shipper and the external company is an intended continuous relationship"*[10]

In both these definitions, we can see that all the main characteristics are mentioned, namely the provider being a separate party, high integration level and also a long-term agreement.

8 Berglund M. 2000, p 15
9 Berglund, M. 1997, p 17
10 Andersson D. Handout material at lecture 2000-11-02

1.4.1 The Use of TPL in this Thesis

The definition of TPL used in this thesis is borrowed from Berglund and is as follows:

> *"Organisations use of external providers, in intended continuous relationships bound by formal or informal agreements considered mutually beneficial, which render all or a considerable number of the activities required for the focal logistical need without taking title"*[11]

When talking about TPL services in this thesis we include all the activities that are part of the four logistical flows, mentioned in the figure "The four flows of Logistics". We do **not** follow the strict interpretation of logistics and in this thesis it is, therefore, sufficient if a TPL service contains just some of the logistical activities. The service can, of course, contain the whole range of logistical activities, but it is not necessary. We also believe that, in reality, it is rare for a company to outsource all of their logistical functions and that it is more realistic to use a more lenient interpretation of the logistic activities needed to be part of a TPL service. More than one activity is, however, needed for a service to be classified as a TPL service. Merely a transport or a warehousing activity is not to be regarded as a TPL service. Together, however, they can be an example of a rather simple TPL service.

To give a clearer picture of how a TPL service might look, we can state the main areas in which TPL providers offer services and also examples of responsibilities of TPL providers. All information is received from a study made by Berglund[12]. We start with the main areas for TPL services:

1. Distribution
2. Transport
3. Warehousing
4. IT
5. Value-adding services

Examples of responsibilities in these areas include: activities related to warehousing, transport, and logistical information systems; different types of value adding services; consultative or design services; and, finally, complete logistical offerings.

[11] Berglund M. 2000, p 19
[12] Berglund M. 2000, p 78

The activities that are most willingly outsourced are customs processing, warehousing, inbound transportation and information systems. On the other hand, activities such as inventory management, finished goods inventory deployment, and client order processing, are least popular for outsourcing[13].

1.4.2 Delimitations of TPL in this Thesis

As pointed out, all activities in the four flows of logistics are counted as potentially being part of a TPL service. We have, however, chosen to delimit the term TPL to some extent. When dealing with the main physical material flow, only the main flow will be included. We, thus, chose to leave out the flow of spare parts and after sales service, as well as the reverse flow of items once part of the main flow.

Further, we only look at the demand of TPL services. A number of studies have been made of the TPL providers and the TPL industry from their perspective. Instead we focus on the TPL customer and investigate their logistical requirements.

1.5 Other Definitions

In this section, we define a number of expressions that are frequently used in the paper. The expressions are followed by the explanations intended to be used in this thesis. Further logistical and technical terms and abbreviations that are used can be found in Appendix 1 "Explanatory notes".

-Customer	The term customer in this thesis refers to the customers of a TPL provider, (i.e. a company).
-Consumer	The term consumer is used to define the end-customer who buys the final product.
-Logistical Requirements	The term is explained and developed in Chapter 2 "Problem Analysis", in the section "Definition of Logistical Requirements".
-PLC	Product Life cycle. The course of a product's sales and profits over its lifetime. It involves five distinct stages: product development, introduction, growth, maturity and decline. The length of a PLC can vary from weeks to months and decades, and the time span is very difficult to forecast.

[13] Harrington L. 2000

-Inbound/Outbound Logistics

In this thesis Inbound logistics refers to the area shown as "Material Management" in the model below. Outbound Logistics refers to the area shown as "Physical distribution".

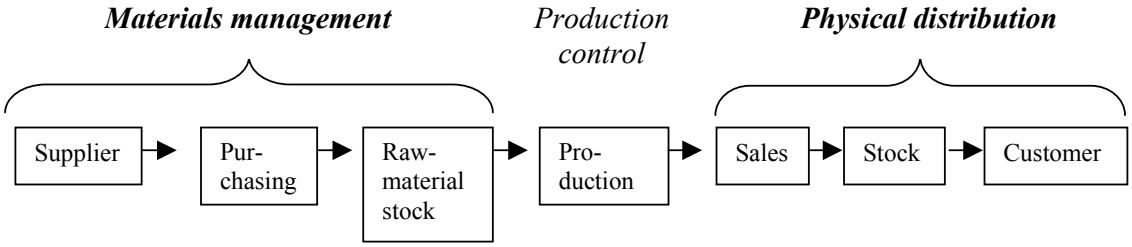

Figure 4: Inbound and Outbound Logistics (Adapted from Storhagen)

1.6 Outline of the Thesis

Chapter 2, "Problem Analysis"
This chapter contains a development of the problem definition. The problem is structured with the help of two models.

Chapter 3, "Theories"
This chapter states the theories used for the models in Chapter 2 and the theories used for the final analysis in Chapter 6.

Chapter 4, "Methodology"
In this chapter, we explain how the research has been designed and how the work with the thesis has been performed. We also give motivations for why we have chosen to work in this way.

Chapter 5," Empirical Studies"
This chapter retells the relevant information received from the interviews we have done.

Chapter 6 "Analysis, Conclusions and Recommendations"
In this chapter we analyse the problem with the help of the theories stated in Chapter 3 and the empirical observations. From this we draw conclusions and make some recommendations for future work.

2 PROBLEM ANALYSIS

In this chapter, we develop the problem definition given in the introduction. The term logistical requirements is analysed and used as a starting point to structure the problem. Models are used to help structuring the problem and the models used are based both on literature and our own pre-study. The theories used as background for parts of the models will be explained and discussed in Chapter 3, "Theory". The pre-study is described in Chapter 4,"Methodology".

2.1 Problem Discussion

Today, as mentioned, Schenker's customers are grouped into different industries and, traditionally, the companies within the same industry are considered to have the same logistical requirements. Nobody really knows if this is true in reality or not. By looking into the main problem we hope to be able to determine whether the traditional segmentation of industries is the best logistical segmentation of the different markets. We also hope to establish whether the industries give a true reflection of the characteristics of the logistical requirements of customers within a specific industry, or if they do not.

To be able to reach a better understanding of the industries and the logistical requirement, as we hope to do, a number of questions need answers. These questions are summarised in the statement of the three sub-problems. Sub-problem 1 deals with identifying relevant logistical activities within the different industries. Sub-problem 2 indicates the fact that two companies within one and the same industry might have dissimilar logistical requirements, even though they are today treated as having the same demands merely because they happen to belong to the same industry. Finally, sub-problem 3 resembles sub-problem 2, but instead deals with similarities across industry boundaries. There might be cases where two companies traditionally belonging to different industries, for example, fashion industry and automotive industry, turn out to have the same logistical requirements.

If we try to look behind the traditional way of segmenting we might find some rather obvious resemblances, regardless of what industry in which the different companies are active. We might also observe that companies that are active in the same industry are not guaranteed to have the same requirements.

2.2 Research Problems

To better be able to approach the stated problems, we have chosen to define two main research problems that are supposed to reflect the areas we need to focus on to be able to solve the main problem.

Research Problem 1:
The identification of relevant and important logistical requirements used by the customers.

This can be seen as a survey of established logistical activities within companies and their supply chains. This survey is necessary since we first need to identify different types of logistical activities before any comparison between different customer logistical requirements can be made. After the survey, we can map out which activities are used by the customers and, thereafter, also select those activities that are relevant and important to our task.

Research Problem 2:
Development of a segmentation-model that can be used as a framework for grouping of the customers according to their different logistical requirements

Once the relevant logistical activities are located, we need a structure to be able to use them as a base for the segmentation of the customers. The next step is, therefore, to develop a model for the segmentation of the customers based on their different logistical requirements.

2.3 Definition of Logistical Requirements

First of all, we need to define the meaning of the expression logistical requirements and what it embraces. We have found the logistical requirements of a company and its supply chain to be rather complex and consisting of a wide range of requirements. We have not been able to find a good description or model that gives a complete description of all logistical activities in a supply chain. Such a typology of supply chains has never been systematically undertaken[14]. Therefore, we have chosen to develop models of our own.

The purpose of the first model, shown below, is to describe the different areas included in the phrase logistical requirements and to help us to structure the many different logistical activities that exist in a supply chain. The model is based on logistical literature, including theories and recent articles. The theories

[14] Cox A. 1997 p 260

used as background for parts of the models will be explained and discussed in Chapter 3, “Theory”.

The model shows that the logistical requirements can be divided into two main areas, internal and external demands. The internal demands are dependent on the company and the product, while the external demands are set by actors other than the company. The internal demands are divided further into product requirements and customer requirements, while the external demands are represented by outer requirements. It is important to note that the internal requirements are not considered or evaluated in any specific order. The product requirements and the customer requirements are equally important and do not appear in any specific order, instead they are to be seen as integrated.

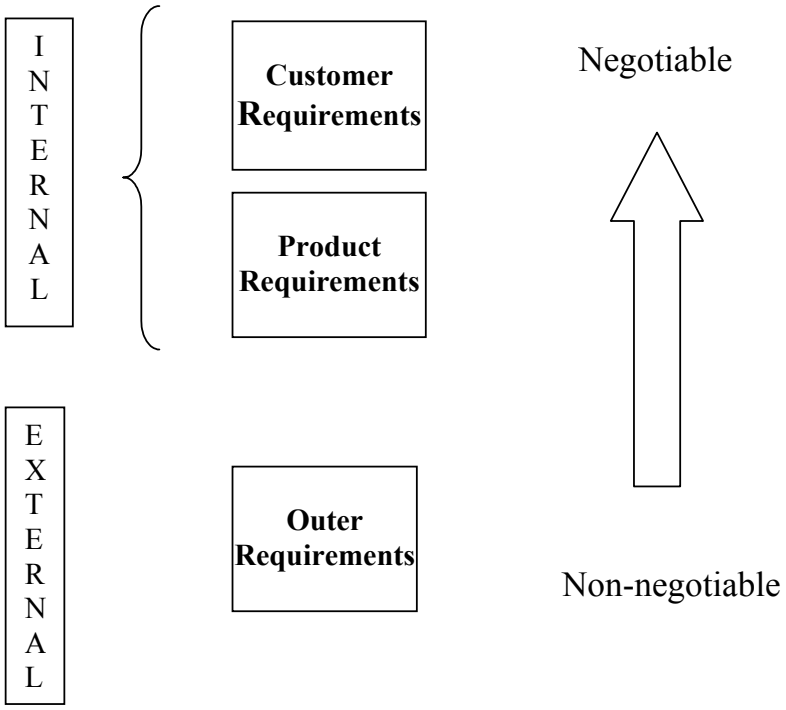

Figure 5: Mapping of Logistical Requirements

The **outer requirements** are more or less non-negotiable. These requirements are often unspoken and not negotiable. Further, they are very difficult an impact and are also more or less impossible to remove or change. The outer requirements consist of laws, regulations and other external factors that have an impact on the company or the organisation. Examples of this are infrastructure and environmental regulations.

The **product requirements** can be seen as basic requirements essential for the product or cargo to be handled correctly and safely. It is the product characteristics that decide these requirements. The requirements can, to some

extent, be seen as negotiable since it is possible to change or remove some requirements if the actual product is changed. Examples of a product requirements are food that needs to be transported and stored refrigerated, or clothes that need be transported and stored hanging.

The **customer requirements** are the most negotiable demands. These demands are specific requirements the customers have and are merely preferences. Therefore, they are possible to remove or change according to the desires of the customers. Examples of customer requirements are customers requesting that all information is done via EDI (Electronic Data Interchange) or requirements on lead-time and time windows.

2.3.1 Development of Model

Figure 5, ”Mapping of Logistical Requirements” is solely based on the logistical literature. We shall now develop the model through the empirical observations we made during the pre-study. The pre-study is further described in Chapter 4, ”Methodology”.

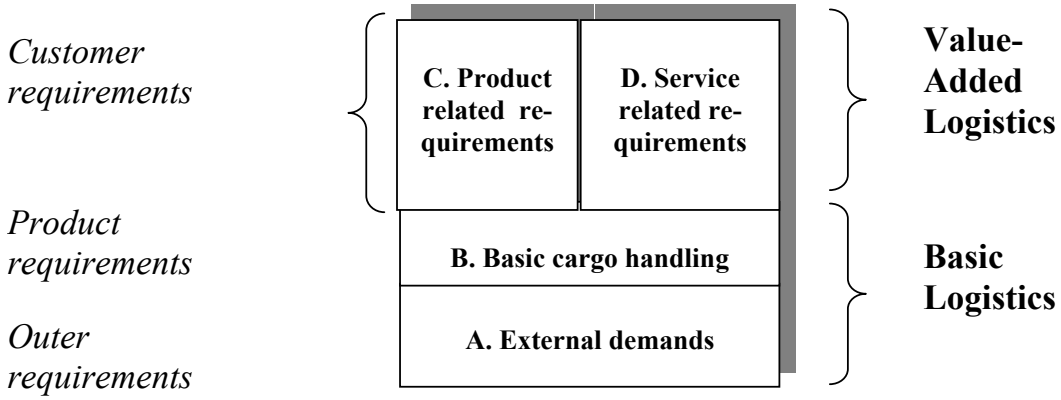

Figure 6: Development of Logistical Requirements

The above figure is a development of the logistical requirements of a TPL customer. As can bee seen, the customer requirements have been divided into two parts. In our pre-study, we made several observations regarding the services that were performed by logistical enterprises. We found one very obvious distinction between product related customer requirements and service related customer requirements. We have illustrated the differences and the postulation for the performances.

We will hereby explain the different boxes:

A. **External demands**. This box is an illustration of the outer requirements that are fundamental requests, which are mainly not expressed. The requests may not be verbalized, but are still of great importance, and are considered before entering a relationship with a TPL provider. This box illustrates the laws and regulations, infrastructure etc. that are external demands and have an impact on customers, as well as the TPL provider.

B. **Basic cargo handling.** This second box is symbolic of the requirements set by the product's characteristics. It includes requirements of services that will help to fulfil the handling of the product and is the basic TPL services. The services that are performed are traditional warehouse storing and terminal handling, including the transport between the sender and the receiver regarding what the product itself requires. The TPL provider must have the right equipment and knowledge to handle the product according to it's specifics demands.

C. **Product related requirements**. The third box is a part of the customer requirements and it illustrates that products can be sorted, knitted, refined and that the package can be changed to add value to the customer, all according to the customer's specific requirements. Highly advanced products can be refined or completed with the help of a TPL provider.

These requirements depend on the complexity and the value of the products. A pattern that we have observed in the pre-study is that products of low complexity also tend to have a low value and, consequently, products of high complexity are also of high value. Our study shows that high value / highly complex products are the ones that have potential of having high customer requirements in form of assembly and refinement. One reason for this is the high value of the product. It is cost-efficient to postpone the final assembly or production of the product as far as possible in the supply chain, since this means less tied up capital. In some cases, the production is made to order and this means that the product is often customized according to the specific demands of the consumer. This leads to a need for extra work to be done on the products at the end of production. Another reason for the high requirements is that complex products consist of a larger number of components and, therefore, there is more work to be done on these products compared to products of a low complexity level.

The products that have a low complexity level and low value do not achieve cost savings by postponing production or assembly. These

products are generally produced in low-cost countries and it is simply cheaper to perform all production there. The products are also often simple, containing only a few components and also produced in large quantities. Thus, customisation is rare.

D. **Service related requirements.** The fourth box is also part of the customer requirements and includes the requirements that not are related to the actual handling of the product. Value is added by other services. This box can be highly specialised and individually developed after each and every customer. This is customised value adding in various areas. Services and areas that are performed today are, for example, controlling of information and process flow, insurance handling, quality, control etc. This box can be developed regardless of the complexity or the value of the product. This type of service has no limits regarding the products and has potential to grow and change according to the requests and needs of each and every customer.

2.4 Basic and Value-added Logistics

The requirements in figure 6 can also be seen as either basic logistic or value-adding logistics. The outer and product requirements can be seen as basic logistic requirements and the customer requirements as the equivalent of value-added logistics. We can then make the conclusion that the basic logistics, i.e. the outer- and product requirements, have to be fulfilled in order to be able to satisfy the value added logistics in the form of customer requirements.

Hence, basic logistics are to be seen as the basis of the customers' requirements and this base is then extended with the value-added logistics in form of the customer requirements. Basic logistics are just as important as value-added logistics, since the fulfilment of these are the prerequisite for any chance of being able to fulfil the value-added logistic requirements.

2.5 Conclusion of the Problem Analysis

The problem analysis is structured to clarify the different logistical requirements. As can be seen, the term "logistical requirements" is too complex to be treated as one single entity. We have, therefore, chosen to structure the requirements into three main types: outer product and customer requirements. The customer requirements have been further divided into two types.

This structure will be used throughout the rest of the thesis. All the remaining chapters follow this structure, but deal mainly with product and customer requirements.

3 THEORIES

In this chapter, we describe and explain the theories we find relevant to our problem. The first part of the chapter gives a presentation and description of the theories behind the models shown in Chapter 2 "Problem Analysis". These theories are used as tools for us as writers, as well as for the readers to help them understand the problem and the way of approaching the problem. The theories are to follow the different levels of the models, starting with internal demand and then dealing with external demands.

The second part of the chapter gives an account of other ways of looking at the TPL industry and its structures. These theories have the purpose of being used as eyeglasses when we in Chapter 6, "Analysis, Conclusions and Recommendations", attempt to analyse the empirical facts.

3.1 Internal and External Demands

Gattorna[15] describes how the internal, as well as the external, environment affects the logistical resources of an organisation. The internal environment consist of items of concern within the organisation and it is easy to see the connection between the internal environment of a company and its logistical functions. Further, Gattorna states that the external environment, on the other hand, might not be the main focus of logistics executives. Still, there is a connection between the external environment and the logistical functions and one should be aware of the affect the enviornment and the changes in the environment has on the logistical functions.

Also Cox[16] has made a distinction between internal and external logistical functions. On the one hand, he mentions the physical structure of a supply chain and how it can vary between companies. The structure of the supply chain can be seen as the internal logistical functions. On the other hand he observes that there are several major differences in regulatory pressure on supply chains in different companies and areas. These pressures, we believe, are a good example of the external environment and the impact it has on logistical resources.

Hereby, we have defined the first level of our map of logistical requirements and made a distinction between internal and external factors. Both have an influence on the logistical processes within a company. We now take a closer look at these two types of demands to determine more precisely what kind of logistical requirements they contain.

[15] Gattorna J. 1990, p 141
[16] Cox A. 1999, p 209

3.1.1 Internal demand

When investigating internal logistical requirements, we found that they can be further divided into two subgroups; namely, product requirements and customer requirements. This division is to some extent based on Torre's and Miller's[17] identification of two different types of logistical factors. They identify two distinct types of logistical factors as a base for logistical segmentation: 1) the logistical needs of the customer and; 2) the product characteristics.

We can also find a similar division when studying a segmentation model of the Third Party Logistical industry made by Berglund et al.[18] The model states that basic logistics and value-added logistics are two of the parameters for segmentation of the TPL industry. The basic logistics are represented by traditional and standard services provided by forwarders, mainly transport and warehousing. The value-added logistics includes additional activities, such as order processing, kitting, inventory management, network design, etc. We believe the basic services match the logistical requirements of the product. Further, the value-added services, in our view, reflect the requirements of the TPL customers.

Another way to look at the division of product and customer requirements is to look at the services that fulfil these different requirements. Kotler uses a model that illustrates how a product or service consists of three different levels[19]. The levels in the model are: core product or as in our case core service; actual service; and, augmented service.

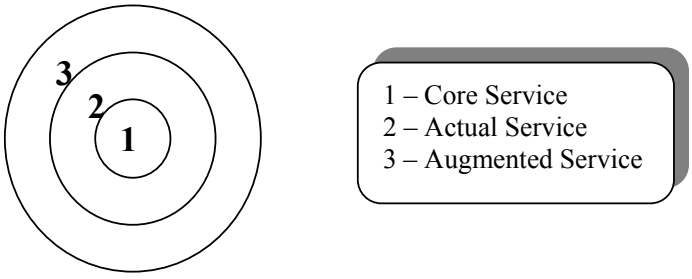

Figure 7: Three levels of a product/service
(Adapted from Kotler et al.)

The core service stands at the centre of the total service. It consists of the problem-solving service or core benefit that the customer seeks. The core service can be said to be what the customer is *really* buying; for example, a customer does not buy a drill, what he/she *really* buys is a hole.

[17] Torres L. Miller J. 1998, p 48
[18] Berglund M et al. 1999, pp 64-65,
[19] Kotler et al. 1999 pp 561-562

The actual service is built around the core service. The actual services include different attributes that are combined to deliver the core benefit mentioned at level one. Thus, this is what solves the customers' problem and fulfils their needs and requirements.

Augmented service is the enlargement of the actual service. It is built around the core and actual service by offering additional costumer services and benefits. It provides the customers with a complete solution to their problem. To the customer, all of these augmentations become an important part of the total service, but they are not, however, a necessity for fulfilling the core benefit. Today, much of the competition takes place at the service augmentation level. Warranties and quick repairs, for example, are offered to add extra value to the product or service. What distinguishes this part of the service is that they can be removed and the core problem of the core service would still be solved.

If we then apply these levels to our model, we can see that the product requirements are represented in Kotler's model as the actual services. The customer requirements correspond to the augmented services in the model of Kotler. An illustrative example is that cargo transportation from A to B can be carried out by most hauliers; it is, in this case, an actual service act. The augmented services, for example time window deliveries, cannot be performed satisfactorily by just anyone. The TPL providers today are competing with the augmented services and not mainly with the core services.

We have discussed the internal demands and made a distinction between product requirements and customer requirements. This means that we have reached the next level in our model mapping of logistical requirements and will, therefore, move on and take a look at the external demands.

3.1.2 External Demands

If we observe an organisation vertically, two sub-systems can be identified. These are named the administrative component, the sub-system that governs, and the productive component, the governed sub-system[20]. A very practical and illustrative example can be a forwarding agent as in most cases they do not have any own transportation vehicles, which is a difference from the carrier that is the actor who actually accomplishes the physical movement. The forwarding agent is, in this case, the sub-system that governs and the carrier is the governed sub-system. The over-all responsibility for a transport to be performed in a correct way belongs to the forwarding agent.

[20] Tarkowski J. et al. 1995, p 82 ff.

The sub-system that governs receives information from its surroundings, competitors, and political interests, but also from the governed system. The behaviour of the governed system depends on the information from the sub-system that governs.

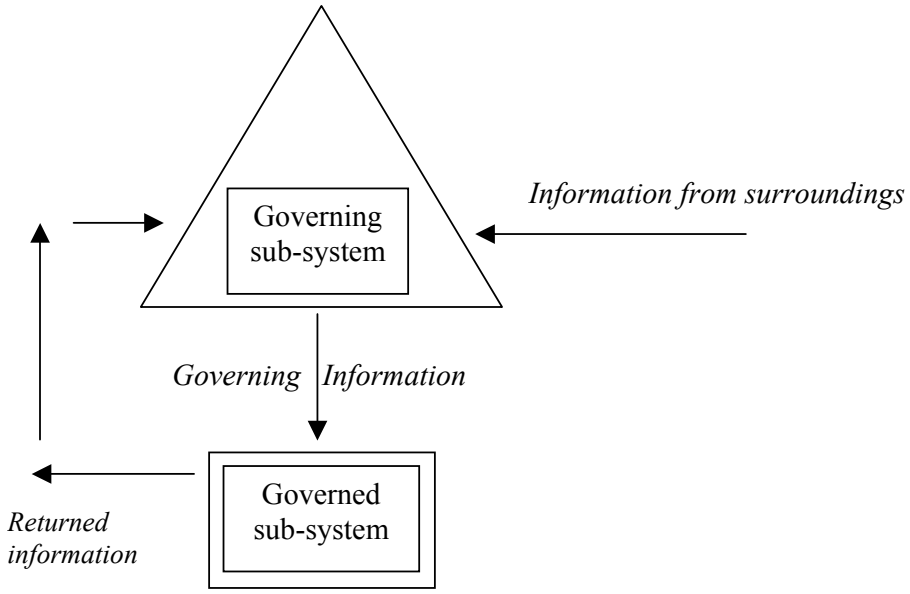

Figure 8: Information in different sub-systems.
(Adapted from Tarkowski et al.)

In our paper, we refer to the external demands, as a sub-system that governs with laws and regulations that the TPL provider and the TPL customers, in this model the governed sub system, has to obey. The given information has to be absorbed, and there are minor possibilities to negotiate. The governing sub-system absorbs information from various kinds of information sources, and must respect all interests from all aspects: global, national, community, as well as market interests. Examples of areas in which the governed sub-system or the TPL provider and the TPL customers are strictly governed, are the infrastructure, handling of dangerous goods, and environmental demands.

Here ends the first part of the chapter outlining theories used as basis for the models in the problem analysis. The following part of the chapter contains theories that are more general and that we refer to in the analysis.

3.2 Different Planning Levels

The following theory is essential for the final analysis, where we use this theory as a tool for interpreting the empirical data. A transport and logistic company's logistical system normally has a built-in hierarchical structure with systems that

can be divided and described as sub-systems[21]. The hierarchical structure for a logistical systems governed sub-system is necessary for breaking down global goals to local sub-goals for different parts in the logistical system. It is a way of creating a manageable way of turning the goals into operative action in the planning stage. In a logistical and transport system, different planning levels can be identified. The planning and problem solving process can be characterised in three different levels.

The strategic level is where planning has the characteristics of creating different alternative logistical systems. This is done without any exact goals. The effects of the alternatives are considered from the perspective of the total system. The overall guidelines, strategies and goals for the logistical system are the result of the strategic planning. In general, it is not told how the different actions will be performed.

The tactic level is a level where the planning is based on some frames and guidelines, since the logistic systems main structure is settled on the strategic level. The result of the planning on this level is more precise and specific plans for the framework for further guidelines. The plan often describes how the resources shall be dimensioned and utilized.

The operational level is where the planning is performed based on fairly well defined assumptions. The problem solving in the planning is partly related to the logistical systems operational actions, and there are a limited number of realistic actions possible. The highest efficiency is achived if the actions on the operational level is performed according to the plans and targets set in the strategic and tactic level. The results from the planning on this level are plans and regulations regarding instructions on how to solve problems in the operational activities in the logistical system. Activities for ordering and controlling of the following of instructions are also fulfilled on this level.

The following figure shows the relation of time spent by a logistics company on alteration work and coordinated work, at each level of planning.

[21] Tarkowski J. et al. 1995, p 85 ff.

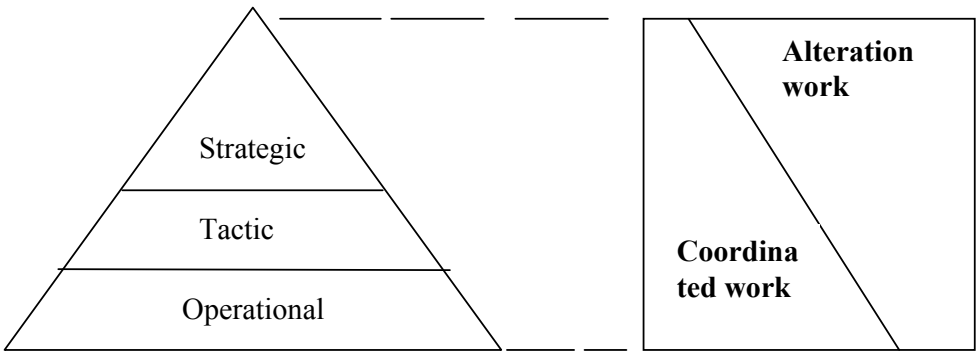

Figure 9: Time spent on alteration- and coordinated work at the different planning levels. (Adapted from Tarkowski et al.)

Every level is dependent on the other two levels and decisions are made on every level. A superior level's decision gives the foundation to the lower levels decision and the expected decision of a lower level is the foundation for decisions on higher levels. The mutually dependent relationships between the levels are strong. For this reason, it is sometimes hard to isolate and focus every activity on every level when it is strongly dependant on the activities of other levels.

3.3 TPL Theories

We have so far only discussed our view on TPL services and have written about theories that describe the structure we have chosen to make of logistical requirements. The structure is supposed to result in a tool that can be used when segmenting the customers of a TPL provider. However, there are other ways of looking at TPL services and some studies have been made that divide the TPL services into different groups or segments. We now describe some of the groupings of different TPL services that we find most relevant.

3.3.1 TPL Services Segmentation Based on Relationship Type

Coyle et al. divide TPL services according to the relationship type and states that a strong relationship also means a larger scope of activities performed by the TPL provider[22]. According to Coyle there are three main types of TPL services. These are correlated to the relationship type, as can be seen in the figure below[23].

[22] Coyle J. et al. 1999, p 344 ff.
[23] Ibid.

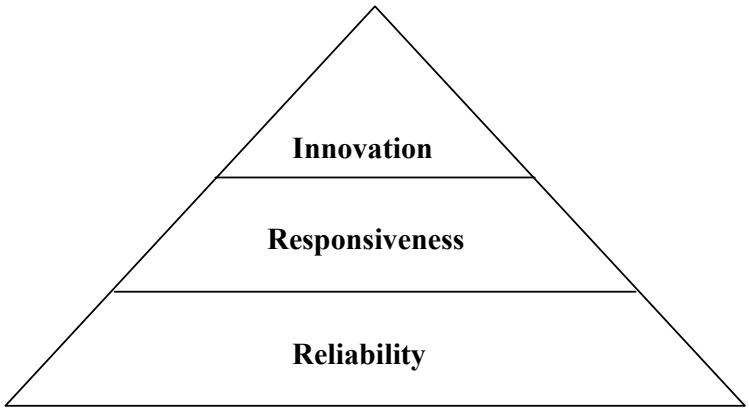

Figure 10: TPL Product Offerings and Relationship Types (Adapted from Coyle et al.)

At the bottom of the triangle we find the so-called "Reliability" services. These services are based on reliability, for example, the service provider is doing everything with 100% accuracy. The deliveries should be on time, no damages are allowed, and the invoices have to be accurate. A TPL provider cannot gain market shares by performing these services well, but can lose market shares if they perform them poorly. The customers are not loyal to their provider and the relationship is therefore considered to be of arms length character. The relationship is made up by a single transaction.

The next level is called "Responsiveness" and this stage includes services such as basic transport service but is integrated with value-adding activities. These can, for example, be transport management, warehouse management, EDI and bar-coding services. If the TPL is performing well there is a chance of increasing its market shares, but if the performance is poor there is a risk of losing market shares. At this level, a contract exists. The relationship is of a longer-term nature and the partnership is of type I and II. A type I relationship is characterised by being short term, with little investments and few activities involved. A type II relationship is on longer terms with higher investments and, consequently, with higher risks involved.

Finally, we reach the top level, called "Innovation". These services fully integrate product, cash, and information flows and can, for example, be inventory management and ERP integration. The services offered at the level beneath serve as a basis for the innovation services. If the services in the second level are performed well the customers become loyal and move upwards to the third level. At this level, a TPL provider can gain market shares by performing well but will most probably not lose market shares if not offering a service or performing it poorly. Having reached this level, the

relationship is most likely of a type III partnership, which is characterised by having no formal end point and a large scope of activities.

According to Coyle, it is important that the TPL provider can identify their services and see what type of relationship matches every service. This makes it easier to decide the scope of the partnership already at the beginning of the relationship.

It is further concluded that the most common and natural way of developing TPL services is to move upwards in the triangle. A relationship starts with basic services and a trust is formed between the parties. Thereafter, the service can be expanded and move to the succeeding level with more complex services. To enter into a relationship directly at the top level is seen as very difficult, yet not impossible.

3.3.2 Segmentation of the TPL Industry

Our aim with this thesis is, as mentioned before, to develop a tool for the segmentation of TPL customers. Berglund et al. have made a similar segmentation tool, but based on the TPL providers and the services they provide, instead of the customers and their requirements[24]. Even though the purpose of the segmentation is not the same as ours, we find it interesting to discuss this segmentation since the logistical services provided reflect the needs and requirements of the customers.

Berglund et al. have found a clear differentiation of strategies in the TPL industry and they follow two dimensions, as seen in the figure below.

[24] Berglund M. et al. 1999

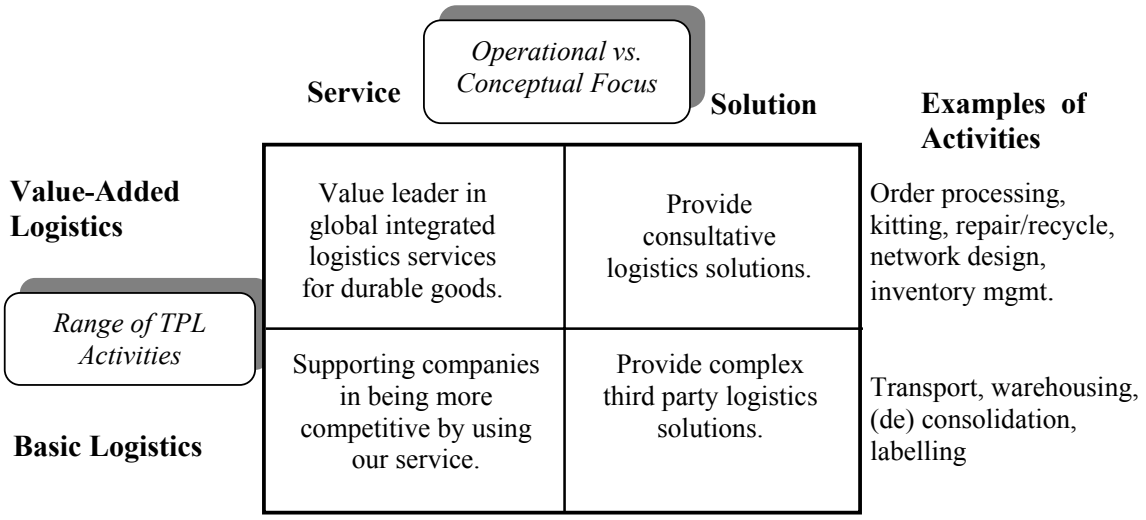

Figure 11: Segmentation of the TPL industry (Adapted from Berglund et al.)

The first dimension of segmentation ranges from standard services to services of a solution character. A standard service is a service that offers specific standardised services and the competence to perform these kinds of services are considered to be operative. The provider can perform the particular service in a superior way. Services of a solution character, on the other, hand offer a complete range of services and a solution. The competence the provider possesses covers a wide range of services that also includes development of the logistical system.

The second dimension ranged from basic logistics to value-added logistics. Basic logistics includes services that offer integrated services consisting of only traditional activities, such as transport and warehousing. The advantages offered by the providers are cost-efficiency and operational skills. Value-added logistics offers additional activities on top of the traditional transport and warehousing activities. The competence is of a functional problem solving character and the provider generally has more personnel in management and business development.

The strength of having a standard service is the actual possibility of standardisation of services. This, however, increases the need of having customers with similar requirements. The strength of the solution providers is that they are providing solutions and, thus, are able to manage complex situations that vary greatly among different customers.

3.3.3 Distinguishing features of TPL services

We have established the fact that the TPL service is more complex than a single transport service and, because of this high degree of complexity, it takes more effort to make a clear description of the TPL service than it takes to define a more simple service. There are more processes to think through when dealing with a TPL service as compared to basic transports or other services with a lower level of complexity. We now look at why it is difficult to give a clear description of a TPL service and what areas that have to be contemplated before buying/selling a TPL service.

Andersson states some areas where the TPL service is distinguished from more basic logistical services, and these are: "Definition of the TPL-service", "Standardisation" and "Stage of development" [25]. A discussion will now follow around these areas and, if nothing else is stated, the text is based on the work of Andersson.

3.3.3.1 Definition of TPL-service

Since the TPL service is quite bundled and complex, an increased need for specification of the service arises. At the same time, it becomes more difficult to make this specification due to the complexity and the many different activities that can be included in the service. A basic service is often very concrete and includes single services like transport and warehousing. TPL services often include more abstract activities and the customers are buying functions and competences rather than concrete services. This leads to difficulties when making a clear service definition. To have a well-defined TPL service is, however, of high importance since the success of a TPL service is to a large extent dependent on how well defined the requirements, procedures and systems are. Important to remember, the risk of making the service definition over-specified. Then the provider's ability to contribute to development and creation of new processes is restrained.

When the problem of *what* to define is solved there is still a problem left of *who* should define service? Studies made by Berglund show that the customers are generally responsible for the design aspects of the TPL service, and the TPL providers are responsible for the execution of the activities[26]. According to Andersson, more responsibility needs to be put on the TPL provider, since they are the ones who best know what the customer wants. The customers should define no more than the actual output he requires and also, together with the TPL provider, define what knowledge and processes he believes necessary to

[25] Andersson D. 2002
[26] Berglund M. 2000, p 120

achieve the wanted results. The TPL provider shall be responsible for defining the activities needed to reach the required output and, also, how these activities should be performed. These parts of the logistical services are the core competence of the TPL providers and, therefore, preferably performed by them.

3.3.3.2 Standardisation

When buying a TPL service, a function often is bought instead of a concrete service, which means that often a new service has to be developed. This makes it difficult to develop standard operating procedures applicable for more than one TPL service. For the TPL provider, this means there is no or little room for internal standardisation and simplification.

Yet some standard procedures need to be developed. The generalised image of a final solution has to be converted into a workable plan that can be implemented. Here one can see a trade-off between customisation and standardisation, which is something Gattorna discusses[27]. He claims that the traditional "one-size-fits-all" tactic of providing standardised logistical services needs to be expanded. An ability to provide customised logistical services by creating tailored logistics for different types of companies and flows also must exist. Further, he states that the right balance has to be found between "one-size-fits-all" and the "segment-of-one".

The problem for TPL services is, hence, to be able to create a service that is customised enough to fulfil the customer's demands but at the same time can be standardised to a specific level so that the service is workable and cost-efficient.

3.3.3.3 Stage of Development

The TPL industry is still in a formative stage or at the beginning of the growth stage[28]. The development is often based on trial and error since the providers have no or little previous experience regarding the services they offer. Therefore, the development of TPL services and concepts are carried out by the customers who often have been forced to teach the providers how to manage the operations. It is rare to find a provider available with the required experience or capability.

Since outsourcing to TPL providers is still at its development stage, few theories have been developed. Also, the interpretations of the theories and the TPL industry vary. As the TPL market grows and develops, so will also the

[27] Gattorna J.1999, p 42 ff.
[28] Andersson D. 2002

theoretical tools describing TPL. The theories we have described are the ones that so far exist and that are the most relevant for the subject of this thesis. Due to the limitation of relevant theories, we will use our empirical studies as a complement to the theories and both have high importance.

4 METHODOLOGY

The purpose of this chapter is to describe the course of action undertaken in this research. In the chapter, we describe how the work with the thesis has been done and how the data has been collected. Further, we also explain the reasons for the research designs we have chosen. The chapter ends with a discussion regarding the strengths and weaknesses of our thesis.

4.1 Thesis Procedure

To be able to solve the problem raised in this thesis, we have tried to structure our work in a way we believe appropriate for reaching the best result. The development of the thesis consists of two different studies, a pre-study followed by a main-study. These two studies have been performed separately and are of different designs and have different purposes.

4.1.1 The Pre-study

At the beginning of our work, we performed a pre-study, which can be seen as exploratory research. An exploratory study can be described as "general picture" research and can be used for many reasons[29]. It can, for instance, help to increase the researcher's familiarity with a given problem and help to gain insight and ideas. Other objectives with this kind of research are to clarify the concepts and break a broad and vague problem definition into smaller and more precise sub-problems. Further, it can be used as basis for setting the priorities for further research.

All these purposes of an exploratory research are more or less applicable to our case. The pre-study helped us to understand the TPL-market better and to outline the providers and customers of this market and the type of services offered. Through this information, we were able to develop a more precise problem formulation. It also helped us to design the main-study in a more accurate way.

Our pre-study consists of a literature search, observations, interviews with people within the Schenker group and interviews with logistical consultants and other experts in the area, such as university professors and lecturers. We visited several of Schenker's distribution centres which have different logistical approaches and solutions for customers. The distribution centres were differently targeted towards fashion, automotive and electronics, etc.

[29] Churchill G. 1995, p 147 ff.

The literature search consists of general logistical theories and also of literature specific to the TPL-market. We have also taken part of internal information material from Schenker. Through the interviews, we have obtained knowledge and experience of people familiar with the subject, and also people who were able to give us more up-to-date information than books often can give.

The pre-study is deliberately designed and carried out in an informal way. The interviews were performed more as open discussions and did not follow any questionnaire. Instead, we stated the area we were interested in knowing more about and gave some general questions. The reason for this informality was to allow the study to be flexible and allow a wide range of approaches. We did not want to miss out on any good ideas or relevant information.

When the pre-study was completed we had a good base of knowledge, which contributed to the ideas and thoughts of the mapping of the logistical requirements. We were now ready to continue and plan the main study.

4.1.2 The Main-study

The main-study was of a different design than the pre-study and can be seen as descriptive research. One of many purposes of descriptive research is to describe the characteristics of a certain group or a set of objects. It is used to give answers to questions like *who, what, when, where, why and how*[30].

The purpose of this study was for us to gather empirical data from companies. This information would then help us to find the answers to the defined problems. Since we had done a pre-study, we knew more precise what to research and what variables that were of interest at this stage. This means that the main study is more focused and structured. The pre-study had provided us with guidelines of what information we needed and in what type of companies we were most likely to find it. Churchill describes the importance of knowing what kind of information you are looking for in the following way:

> *"Facts do not lead anywhere. Indeed facts, as facts, are the commonest, cheapest, and most useless of all commodities. Anyone with a questionnaire can gather thousands of facts a day – and probably not find much real use for them. What makes facts practical and valuable is the glue of explanation and understanding, the framework of theory, the tie-rod of conjecture. Only when facts can be fleshed to a skeletal theory do they become meaningful in the solution to the problem".*[31]

[30] Churchill G. 1995, pp 163-164
[31] Ibid

Our pre-study can, in this case, be seen as building the skeleton Churchill mentions, by providing models and a framework. The main-study provides the needed information to fill these models, or as Churchill puts it, it provides flesh to the skeleton.

When performing our descriptive study, we used a cross-sectional type, which has two distinctive features[32]. Firstly, it provides a snapshot of reality at a certain point in time. Secondly, it consists of a sample that represents a bigger unit. This means that in our study, we have chosen a sample of companies. These have then been interviewed at a single point in time. We have then been able to make a generalisation applicable to a larger part of the market, based on the data collected.

We will now further describe how the study was performed and why. What type of method was used, how the selection of companies was made and what criteria the selection was based on will be discussed.

	Type	Why?	How?
Pre-study	Exploratory	* Gain better understanding of the TPL-market * More precise problem definition * To set priorities for main-study	* Literature search *Informal Interviews * Observations
Main-study	Descriptive	* Find answer to problem definitio by gathering empirical data.	* Interviews

Figure 12: Summary of the two studies made

4.2 Qualitative Method

We have chosen to perform a qualitative study with interviews as the method for collecting data in the main-study. In this section, we first describe the characteristics of a qualitative study and then motivate why we have chosen this design. Thereafter, we point out some of the weaknesses with this type of research design.

[32] Chirchill G. 1998 p 177

A study performed by a qualitative method. aims to collect a large amount of information regarding a relatively few study objects[33]. This data helps to illustrate and describe a situation and gives a complete picture of the situation. This makes it possible to go deeper into the problem. A qualitative study also shows interest in coherences and structures and it tries to describe and understand a certain phenomenon.

The observations in a qualitative study are generally performed unsystematically and in an unstructured way, for example, in form of following interview manuals without fixed questions and answers. The absence of structure is to enable flexibility. The researcher is able to adapt both the actual questions and the order of the questions during the interview and, thereby, obtain more reliable information. The qualitative study is, thus, open for new information and knowledge during the time of the study.

The main reason for us to choose the qualitative research method is the need of empirical data that will give us an understanding of the whole logistical process within companies. We wanted to be able to see a whole structure and not just small selected parts. Since we had such a wide area to cover, it was not possible for us to formulate precise questions and it was also not what we needed.

Instead, the qualitative method gave us the flexibility we required and allowed us to adapt the questions to the specific company we were interviewing, if necessary. This was needed since the companies we interviewed were in many ways very different in from of size, products, logistic strategy, etc. The quantitative research method can be described as "*giving everybody shoes of size 8"*[34], which points out the problem of giving the same instructions to all. Using a qualitative study, we were able to avoid this problem.

Flexibility, however, is one of the weaknesses of the qualitative study[35]. The flexibility and the adapted interviews make it somewhat difficult to compare the information obtained. The possibility of changing the questions and the structure of the questions during the research can also lead to problems with different types of information. The last interviews performed tend to give more relevant information than the first ones, since the researcher has had time to gain more knowledge during the time of the study.

Another weakness is the difficulty of making generalisations with information from qualitative studies. The number of interviews is often too small to be able to generalise and make conclusions on a larger group. To be able to make

[33] Holme I. & Solvang B. 1997 pp 78 ff
[34] Holme I. & Solvang B. 1997, p 99
[35] Ibid p 79 ff

generalisations, the research has to have structured questions often with standardised answers. This means that you will lose the flexibility, which is one of the main advantages of a qualitative study.

Hence we can see a trade-off between flexibility and structure. If flexibility is prioritised, you tend to jeopardise the ability to make generalisations. If standardisation is prioritised, you can make generalisations, but have the risk of not acquiring relevant information.

A discussion regarding the methodoligal strength and weaknesses that is more related to our thesis is done in the end of this chapter.

4.3 The Interview Guide

Since we used a qualitative method, we have not used standardised questionnaires. Instead we have formulated an interview guide (found in Appendix 2) for the interviews in the main study. The interview guides consist of main areas of information that are of interest to the study. Within these areas, we have listed topics and questions to which we want answers.

The interview guide is designed and developed using the models described in Chapter 2 "Problem Analysis" as a background. The models have helped decide what information we needed obtain and how to structure this information into different areas. The idea of the interview guides is to have them as a checklist at the time of the interviews. The people interviewed have been sent a list of the main areas we want to discuss in advance, but the more detailed questions and topics are solely meant for us as a reminder of what information we want to obtain during the interview. During the interviews, the interviewed person was free to talk about the main areas and fill in with other aspects that he/she felt were relevant. The only time we asked a direct question was if we felt something was missed in the area we wanted to cover.

The purpose of interviewing in this way was to allow the respondent to talk as freely as possible and having them explain the logistical procedure of that specific company as exhaustivily as possible.

4.4 Selection Method[36]

When making a quantitative study it is important to a have a selection that is representative statistically and that reflects the whole population of the study as much as possible. In a qualitative study this is, however, completely irrelevant. Instead, the aim of a selection for a qualitative study is to gain as large variation

[36] Trost J. 1997, pp 105-110 (Used as reference for the whole section 4.4)

as possible and not have respondents that are similar to each other. The selection should be heterogeneous within a given frame.

The most appropriate selection method for a qualitative study, therefore, is the strategic selection instead of the representative. When making a strategic selection, you decide on a number of variables or characteristics that are of theoretical importance for the study. These are then used as the basis for selecting respondents for the interviews.

Company	**Location in Supply Chain**	**Type of Product**	**Industry**
Retail and Brands	Retailer	Non-complex Low-value	Fashion/Clothes
JC	Retailer	Non-complex Low-value	Fashion/Clothes
Ericsson & Saether	Wholesaler	Non-complex Low-value	Fashion/Shoes
Estrella	Manufacturer	Non-complex Low-value	Food
Atlet	Manufacturer	Complex High-value	Light Industrial
Husqvarna	Manufacturer	Complex High-value	Light Industrial
Nolato Gota	Supplier	Non-complex Low-value	Polymer
Shell	Manufacturer	Non-complex Low-value	Chemical

Figure 13: Selection variables for the selected companies.

When selecting companies for the main study, we very much followed the strategic selection method. We first established what variables that were of importance for our study and then selected companies according to these variables to get as large a variation of companies as possible. The variables, as well as the selected companies, are shown in the figure above. As can be seen, the selected companies are very different regarding the selection variables we found relevant.

One variable we also have taken into consideration when selecting the companies that is not shown in the figure is the size of the companies. We have tried to select companies of different sizes, but the selection is not made according to any specific figures. Instead the selection has merely been made based on our own perception of size of the companies.

We deliberately chose to keep the number of interviews relatively low. This is also what is generally recommended when performing a qualitative research[37]. If too many interviews are done it makes the information material difficult to handle and it might not be possible to see the necessary details. Hence, qualitative studies should be carried out as the name suggest, through a few well-performed interviews rather than through many poorly performed interviews. It is the quality, not the quantity, that is of importance.

4.5 Data Collection

Data has been collected and comprises a large part of the thesis work. This collection of data consists of two types, primary data and secondary data. If the researcher himself/herself has collected the data for the purpose of the research it is seen as primary data. Secondary data is data that has been collected by others and is not for the purpose of the immediate study[38]. In our work, both types of data have been collected and combined. It should be noted that a large part of both the primary and secondary data that have been collected does not occur as direct references. They have merely served to help us to form a general picture of the topic and the problem.

4.5.1 Secondary Data

The secondary data was our starting point in working with this thesis. We have used a large amount of both internal and external secondary data. The internal data consists of information material provided by Schenker. The external data is in form of books, articles and dissertations and from this data we have found general theories that are used as tools to structure the problem by creating models. Even though the data found in books and articles are of importance, we found that it had its weaknesses. There are two main disadvantages of secondary data, problems with data fit and accuracy problems.[39] We experienced both.

[37] Trost J.1997, pp109-110
[38] Andersen I. 1998, p 150. and Churchill G. 1995, p 270.
[39] Churchill G. 1995, p 273 ff.

First, we realised that all secondary data does not completely fit with our problem. Some parts of the literature were applicable, but many parts were not corresponding or not to be found at all. We found that TPL is an area that still is rather unexplored and there is a limited amount of literature written on it. Further, we also saw that it can be difficult to determining the accuracy of the data. In our case, this mainly dealt with the problem of finding recent data and information that still was valid. Since TPL is a rather new phenomenon, we found some of the material to be obsolete and not valid anymore. To overcome these weaknesses in our data collection we also gathered a large amount of primary data.

4.5.2 Primary Data

The collection of primary data has been done in two stages; first at the time of the pre-study and, then, later at the time of the main-study. In the pre-study, informal interviews and discussions were made as a complement to the information found in the secondary data. In these interviews and discussions, we could find what the secondary data lacked; information that was related to our actual topic and information that was more up-to-date than the literature.

The data collection in the main-study has been further described in section 4.2 “Qualitative Method”.

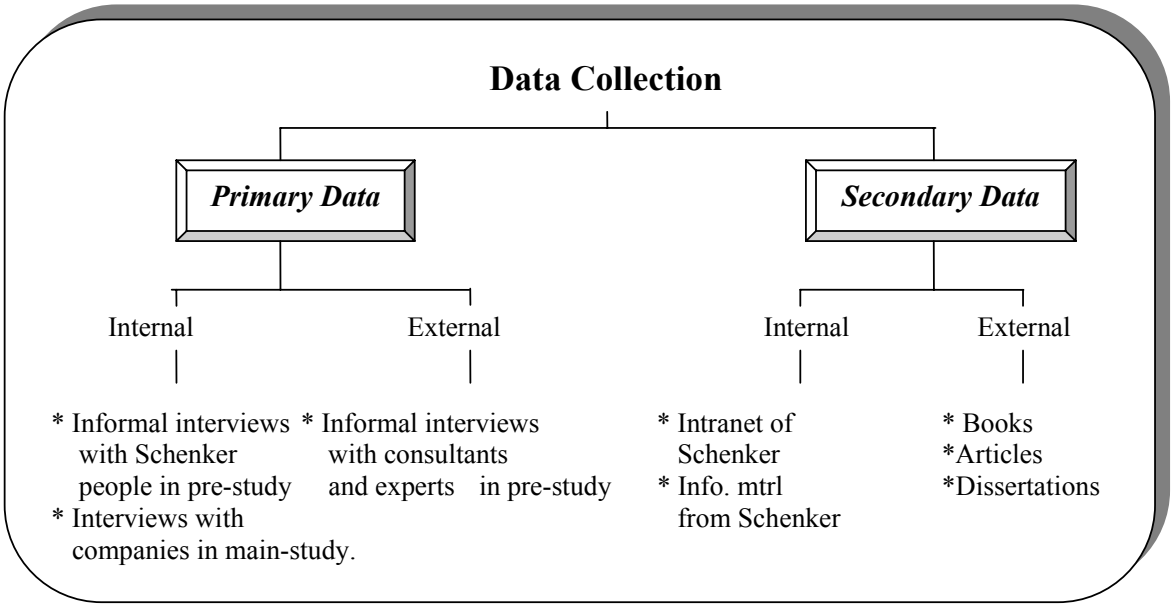

Figure 14: Summary of the data collection

4.6 Reliability and Validity

Reliability and validity are central issues when discussing the credibility of a study. To make sure the results of a study are trustworthy, one has to take the reliability and validity of the study into account.

Reliability deals with *how* something is measured. It means dependability or consistency and it is an indication of the consistency of a study. High reliability implies thatanother study performed under identical or similar conditions as the first study would show the same results[40]. But the reliability is assumed to be based on given variables, which are found in standardised researches[41]. Qualitative studies are characterised by a low level of standardisation and, subsequently, the term reliability not the right term to use.

Validity concerns *what* is measured and if you measure what you intend to measure. Validity describes the fit between reality and what is actually measured in the study. Absence of validity occurs when there is a poor fit between the constructs a researcher uses to describe and analyse reality and how reality actually looks[42]. The figure below illustrates the relationship between reliability and validity[43]

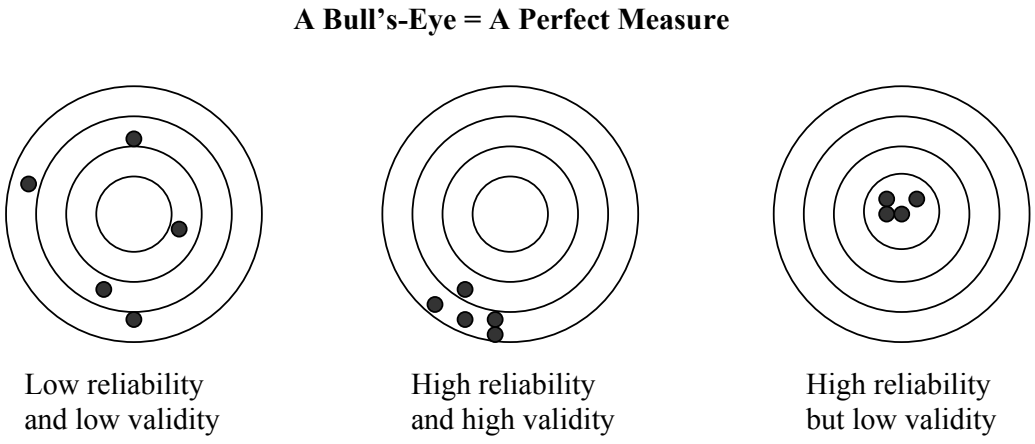

Figure 15: Illustration of relationship between reliability and validity (Adapted from Neuman)

The validity of qualitative studies is, however, also of lesser importance than in quantitative studies. The form of a qualitative research is such that you do not have a specific concept you want to measure. The concept is instead built from

[40] Neuman L. 2000, p 164
[41] Trost J. 1997, p 100
[42] Neuman L. 2000, p 164
[43] Ibid p 171

of the data collected in the study. Thereby, the question whether you have measured what you intended to measure becomes less relevant[44].

Instead of the terms reliability and validity, qualitative researchers are more interested in the authenticity of the study. Authenticity means giving a fair, honest and balanced description of reality[45] and what really should be measured is the trustworthiness of the study.

4.7 Strength and Weaknesses of our Thesis

We estimate The trustworthiness of our thesis to be relatively high. With the resources we had and within the scope which we have been working, we believe that the results of the thesis give a good and fair picture of reality. Another study using the same structure and tools will most likely come up with the same results. There are, however, some weaknesses with our study of which we are fully aware. There are also some strengths that we would like to point out. These strengths and weaknesses will now be discussed separately for the two studies made, the pre study and the main study.

4.7.1 The Pre-study

The main strength of the pre-study is that all the discussions we have had were with people who spoke very freely on our topic. This has given us a large amount of valuable, relevant and up-dated information.

The weakness of the pre-study is that the majority of the people we have talked with are within the Schenker group. This leads to a risk that the information we have received might have been one-sided and leaves out certain aspects. We have been aware of this risk and, therefore, we tried to meet and speak to other more objective persons, such as logistic consultants and university professors.

4.7.2 The Main-study

We regard the strength of the main study to be the large variation of interviewed companies. With the help of the pre-study, we knew what relevant factors to look at in each company in order to get as large a variation as possible. This has resulted in our conclusions being valid for a large part of the customers in the TPL industry.

A weakness is that the number of interviewed companies might have been slightly too small to make any broad generalisations covering all existing TPL

[44] Eneroth B. 1994, p 59
[45] Neuman L. 2000, p 171

customers. We feel that a few more companies in other industries might have added extra strength to the conclusions. Since we had limitations, mainly in time, this has not been possible. Another weakness that is also related to the time limitation is that we have only been able to speak to one person in each company. Thus, a single person's view on logistics has come to represent the logistical requirements of the whole company. This might have lead in some cases, to us missing out on important information.

To avoid this, we should have considered speaking to more than one person in each company and maybe to people in different levels of the company. If we had done this, we would have received information that would have provided us with a picture closer to reality. Again, we were not able to do this due to time restrictions.

4.8 The Research Process

To conclude this chapter, we show a model that summarises and illustrates the line of work that has been described in this chapter. The model shows how the work with the thesis has been structured and what parts are based on others.

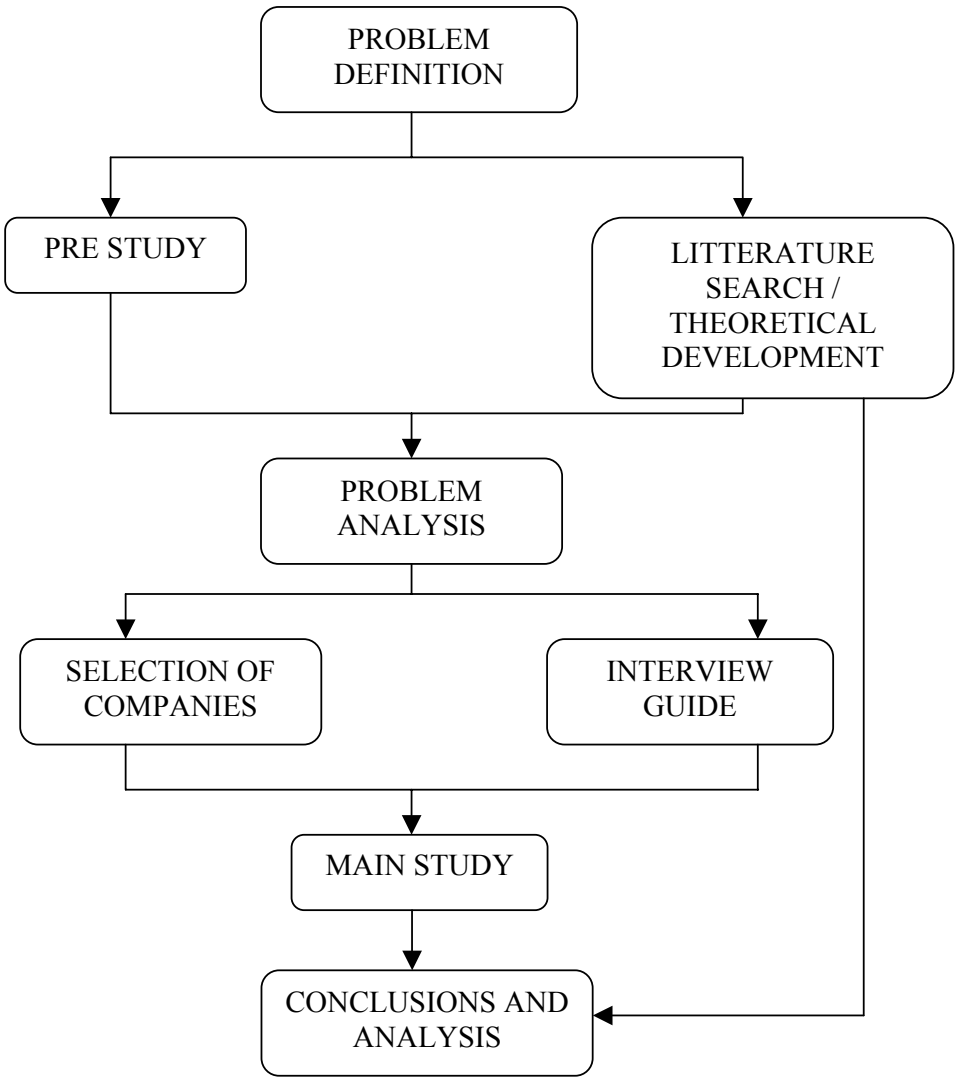

Figure 16: The Research Process

5 EMPIRICAL STUDIES

In this chapter, we present the information gathered at the interviews for the main study. Through these interviews, we received a large amount of information regarding the companies' logistical processes. We will, however, emphasise the important aspects and only retell the parts that are of relevance to the problem of this thesis. Likewise, it would not be relevant to go into too much detail regarding a specific company and, hence, we will not do this. This is because the interviewed companies are to be seen as representing a larger group and will function as a giving a generalised picture of similar companies.

5.1 Layout of Chapter

The chapter deals with one company at a time. First, there is a short presentation of the interviewed companies. Thereafter, the information gained at the interviews will be retold. The structure of this information will follow that of the interview guide (see Appendix 2) which in turn is based on the model "Development of Logistical Requirements" in Chapter 2 "Problem Analysis". The questions deal with both product requirements, as well as customer requirements. Hence, the information for every interviewed company will be divided into the following sections: product requirements and customer requirements. The short presentation of the companies is to give a picture of who they are and their business. The company presentation begins with a description of the product and how these products are sold, (i.e. the design of the supply chain). Thereafter, we state what market the companies are active in and also where the production takes place. Finally, we state what part of the product flow we have chosen to study more closely.

In the sections dealing with the product requirements, we state how the actual product is handled and what the product requires. First, we look at the product characteristics and see what distinguishes the product. Thereafter, the special requirements for the product will be stated and these can either be more or less non-negotiable, as determined by the actual product, or changeable requirements decided by the customers.

The section called customer requirements contains the logistical requirements and demands of the interviewed companies. There are demands and requirements that the product itself does not require, but the company does. The customer demands and requirements are of no less importance that the product demands. We have divided the section in three areas. The first area deals with how the *information flow/the order procedure* is carried out. Area number two states the *level of integration* between the different actors. The third area

discusses how *the production process* is performed. There will be a short summery of logistical awareness in the end of the chapter, which contains empirical observations of more general logistics issues made during the company visits.

5.2 Retail and Brands

Retail and Brands (RnB) is a large recently formed fashion-group, that consists of five different stores each with their own concept. The group RnB own, run and develop the store concepts: Polarn O. Pyret, Saks, Solo, Blombergs and NK/Varumärkesbutiker. All of these concepts are retail stores with strong brands that are aimed at fashion-conscious customers with an eye for quality. The price of the products is generally higher than the average in the fashion industry.

We received some information regarding all the five different stores but most of the information has been regarding Polarn O. Pyret (POP). Therefore, the main focus has been on these stores. Thus from now on, if nothing else is stated, POP is the concept referred to when RnB is discussed.

POP´s assortment consists of "Polarn" which is children´s clothing, "Pyret" consisting of baby's clothing and "O.", the collection of women´s clothing. The whole collection of POP is designed by POP´s own designers and only sold in the official POP stores. The retail stores are located in Sweden, Iceland and Åland. The main production, however, is situated in South East Asia, but some is also to be found in southern Europe.

As mentioned, when discussing RnB we will almost exclusively look at POP's flow of goods, which consists of products designed by POP themselves. This means that there is no purchasing of finished goods but rather of raw material and fabrics for production. In this case, we look at the outbound flow of goods. The logistics of the physical flow as well as the information flow from production to distribution out to the retailers will be discussed.

5.2.1 Product requirements

Product characteristics:

Clothes can generally be seen as a product with low level of complexity since it does not consist of a large amount of different components. This is also true for the products of RnB. The value of the product is rather low and clothes can be classified as bulky cargo since it demands large space during transportation and storage in relation to the low weight of the product.

The life cycle of the products varies. Polar'n O. Pyret has a basic collection, which does not change much from year to year. The life cycle of these products can be seen as quite long, up to several years. However, the stores also have more fashion intense clothing that changes from season to season and the life cycle of these products is considerably shorter.

The demand structure is characterised by having three main seasons: autumn, spring and Christmas. In the beginning of each season there is a peak of sales. The basic collection, though, has a more steady demand, as does baby clothing, which is not as strongly connected to each season. Other store concepts with a more "trendy" niche like Solo, have a much higher degree of fluctuation in their demand.

Product Requirements:

No specific requirements are needed for handling, storing, packaging and transportation of the clothes. The exception is when it comes to garments that must be stored and transported hanging. Then special requirements in all the mentioned areas exist. The handling will be more time consuming, the storing and transportation more space demanding and the packaging more complicated. All products are transported by sea or from Europe by road vehicle. The products are to some extent consolidated at the central warehouse.

Barcode labels are sent down by POP to the production site where the labels are placed on the boxes that are to be delivered. In the future, this routine will hopefully also be applicable for the other store concepts in RnB. The labels are produced in a small workshop owned by POP and they considering also producing the woven labels inside the garments in the future.

5.2.2 Customer requirements

Information flow/order procedure:

The information exchange between the suppliers and the company is performed in a very traditional way, with representatives visiting suppliers and plants. Other conventional ways of communicating are with fax and telephone, and, to some extent, also e-mail. 40% of the produced garments are stored in a central warehouse in a so-called filling up storage in Stockholm. Every store is on-line with the central warehouse, so the stores can observe what orders that are left, and order directly what they need. They are also working on being able to follow on-line what garments and what orders are left in each and every shop.

The order is placed at the supplier about a year to a year and a half in advance. What fabric and raw material that are provided by sub-suppliers are sometimes a decision that the company is involved in before the production process is

starting. Sometimes the garment fabric and material with long product life cycles (PLC) can be placed with the supplier in advance, with the purpose of shortening the lead-time between placing the final design and the production. All purchases and orders are placed centrally, and cannot be done by the retail stores. 60% of all the garments are delivered directly to the stores.

Level of integration:
The level of integration with the suppliers is not very high even though there is some co-operation in the R&D process. The focus is more on integrating the retailers, as explained in the section "Information flow/order procedure".

Production process:
The production is mainly performed in Asia and the exact procedure is not known. Due to the fact that the company finds the market demands to be more and more fluctuating, they are trying to shorten the lead times by buying fabrics and materials in advance. Since the lead times regarding ordering and delivering,are quite long from the factories that are mainly in Asia, the company is looking at suppliers in low-cost countries closer to its market. The production is mainly based on a push-strategy.

5.3 JC

JC is a chain of fashion retail stores consisting of four different brands with their own concepts and stores. First there is the brand Jeans & Clothes, which has an assortment that is aimed at young people between the ages of 19-25. Another concept is JC Boys & Girls´, which targets children between the ages of 6-13. These two brands are usually located in the same stores, which is not the case in the last two concepts. Brothers is also part of the JC group and these stores have an assortment of men's fashion clothing aiming at men between the ages 20-45. Finally, there is the brand and concept of the Sisters' stores, which were just recently opened. These stores can be seen as the female equivalent of the Brothers concept.

In the interview we almost exclusively discussed the first two concepts, JC Jeans & Clothes and JC Boys & Girls and only on some occasions did we relate to the logistics of the other two brands, Brothers and Sisters. In the continuing text we will, therefore, focus on the first two JC concepts. They are referred to as simply JC.

JC' s collection consists of both clothes of their own design, which only can be found in their own stores, and clothes of large global brands such as Levi's, Lee and Diesel, which many different retailers sell. The geographical market JC is acting on and where their retail stores are located is Sweden, Norway,

Denmark, Finland and Germany. The main part of the collection is produced in the Far East.

The flow we have focused on is the flow of the products that are of JC's own design. The products that are bought as finished products will not be discussed. Further, we look at the logistics in the part of the supply chain that consists of everything from the production up to the distribution to the retailers.

5.3.1 Product requirements

Product characteristics:
Garments can be seen as products that are not very complex, which is true. There are, however, different levels of complexity within the product garments. A winter jacket can be seen as more complex than a basic t-shirt since the jacket has many small details such as zippers, hoods, water repellent material, etc. Generally, however, the products can be considered as uncomplex. The value of the goods is also relative, of course, but can on the whole be regarded as rather low value. The goods can also be classified as bulky cargo due to the low weight. The goods gets even more bulky if they has to be handled and transported hanging. Hanging garments is only the case in 1% of JC's goods flow, but rather common for the products of Brothers and Sisters.

JC has divided their products into three different groups all with different product life cycles (PLCs). The so-called trend products stand for 10% of the assortment and have the shortest PLC. These products are bought by so-called early adopters and are quickly replaced by new trend products. The fashion products, 50% of the assortment, are bought by the large mass of consumers and the PLC of these goods is somewhat longer than the trend products. Finally, there are the basic products, 40% of the assortment, with the longest PLC, which can stay on the market at least 4 seasons. Examples of basic products are classic models of jeans and basic sweatshirts.

There are two main seasons for JC, spring and autumn plus an extra season at Christmas. Each main season is then divided into two sub-seasons and this is further complemented with shorter temporary "seasons" when certain themes pervade the stores. The demand structure is unstable and hard to predict, since it can change fast and greatly. The collection of basic products has, to some extent, a more stable demand than the rest of the products.

Product Requirements:
There are no special requirements for handling, storing, transporting or packaging the goods. JC has developed guidelines for their suppliers on how to pack the garments in a way that they will stay fresh and not become wrinkled.

This makes hanging garments almost non-existing in the goods flow. The transportation mode is by boat from Asia and by road vehicles from Europe.

All products are transported to the central warehouse where they are consolidated and delivered to the stores. For the trendy and fashion products, the warehouse is supposed to function more or less as cross-docking site where the goods are merely redistributed. Products in the basic collection, however, are stored in the warehouse ready to be distributed when an order is placed.

Barcode labels are placed on the boxes directly at the suppliers. The barcode labels are sent down by JC and the barcodes states the name of the supplier, what order number the box belongs to, and what type of assortment the box contains. At the distribution central, an extra bar code label is added with information regarding which store is the destination of the box.

5.3.2 Customer Requirements:

Information flow/order procedure:

The information exchange between the suppliers and the company is performed by visiting the plant, suppliers and sub-suppliers and also by telephone, fax and e-mail.

The company also has three productions offices which are located in; Hong Kong, Turkey and Italy. These offices have personnel from the company, which also have much of the direct contact with the affected actors. The production offices do the quality control of the products and the packaging before the cargo is being transported.

The retailers can communicate through the company's Intranet, with each other and also buy and sell products directly without the administration offices' involvement. The products are being sent between the sellers with a specially developed cardboard box, which is prepaid. It is also possible for the company to see how much has been sold down to SKU level in every store. This is also the base for forecasting the next collection.

The order procedure is different regarding the type of product that is to be ordered. There are four different types of product with 25% share each.

They are:

- *"Drop"* The products that are meant to be sold during special campaign week, or special topic weeks.

- *"Volume"* Products sold during a whole season.

- *"Supplementing"* Products that will be sold for at least four seasons, and that will be continuously replenished in the stores. These products are stored at the central warehouse, and the lead time to the retailer is 48 hours.

- *"Open to Buy"* 25% of the procurement budget is saved to do repeat-purchases of products that did have a higher demand than expected.

The following order procedure is relevant regarding the "Drop" and the "Volume" products. In October 2001 they were working with purchasing for the Autumn collection 2002 and the Spring collection 2003. In December, the Purchasing department will visit the Far East suppliers, and together with them settle the basic collection for Autumn 2002 and also process the first "trial" collection. The procurement for the Spring collection 2002 is discussed and minor changes can also be done. In this order process they work with three garment collections at the same time.

When the order is settled, what amount every retailer will receive is also decided. The "Drop" and "Volume" products are ordered in specific pre-decided sizes and colour assortments. The supplier will mark the boxes with the bar-coding tags that the company has delivered to them. The responsibility for the garments will be JC's as soon as the products leave the plants.

Regarding the "Supplementing" products, they have a somewhat different order procedure. The garments are bought continuously and stored in the central warehouse, where the retailers can order on-line directly from the warehouse. It is also possible for the retailers to follow what has been sold during a specific time in the past and to see last week's orders.

Level of integration:

The integration between the suppliers and the company is not very high, but it is very important for JC to have as few suppliers as possible and at to have long term relationships. In cases of claims, refilling orders, etc., long-term relationships are very important. The importance of suppliers' routines, acting and confidence during specific circumstances is considered more valuable than always having the lowest product costs. One way of increasing the flexibility is

to buy fabric and garment materials to the suppliers in advance. This is done in order to give the plant the final order as late as possible before the productions process is due.

Production process:
The production process is mainly a push-strategy. This strategy regards the "Drop" and "Volume" garments that are produced long before the market has a demand. The "Supplementing" garment has another kind of push-strategy. They are also produced a long time in advance, but since the PLC is longer than other garments it turns into a pull-strategy. When a specific type of garment is delivered to the retailer from the central warehouse, an impulse goes to the producer to start up the production process for this type of garment.

5.4 Ericsson & Saether Shoes AB

This company was founded a decade ago and today it has almost 20 employees. Their products consist of shoes for children, women's shoes and boots and also a minor collection of men's shoes. The main part of the collection is made up of their own design, but a small proportion of the assortment consists of shoes of a large American brand. The latter shoes are bought as finished products. Recently, handbags have become a part of the collection to match the shoes and boots for women and these are also bought as finished products. All products are sold to individual and freestanding retailers who, in turn, sell them to the consumers.

The market for these products is the Nordic countries, Sweden, Norway, Denmark and Finland. The products are mainly produced in the Far East, but a large part are also made in Italy and also some in Portugal.

We will discuss the whole product assortment of Ericsson & Saether and will deal with the logistics from production up to delivery to the retailers.

5.4.1 Product requirements

Product characteristics:
Shoes and boots can be regarded as products of rather low complexity. Admittedly, shoes consist of many different parts that have to be combined. Compared to technology products, shoes are not complex. The value is also rather low and the products can be seen as bulky goods due to their low weight in relation to the relatively large space taken up by a shoebox.

The life cycle of the products are rather short, approximately 6 months. Then a new season begins and the products become difficult to sell. The year is divided into two main seasons, autumn and spring, with an additional middle-season at

Christmas. The demand is characterised by large fluctuation and greatly dependent on the weather. Some years ago the demand was more stable and followed the seasons. In the autumn, it was predicable to have a high peak of winter shoes. Now the demand does not reach this peak if it is a warm autumn and winter. Thus, the demand peaks can be said to have become flattened, while at the same time the demand has become more dependent on the weather and consequently more difficult to predict.

Product Requirements:
There are no specific requirements for handling storing, transportation or packaging. The goods are transported by boat since their low value would not allow higher transport costs. The shoes are packaged in boxes that serve both protection and marketing purposes. The shoes are stored and consolidated at a central warehouse. The suppliers at the production site label the shoeboxes with barcodes. This is only done for E&S's largest retail-customers and it is the EAN-barcode system that is used.

5.4.2 Customer requirements

Information flow/order procedure:
According to the company, the shoe business is very conservative. The information between the retailers and E&S is very traditional. A sales representative present every shoe model to every retailer, and takes up an order manually. The order is then transferred to the company either by phone, fax, mail or to a very limited extent by Internet. The company has a homepage, and some of the retailers place additional orders on the Internet. Regardless of how the order arrives at the company, they manually punch in the information and send it by Internet to their central warehouse. The information exchange between the suppliers and plants is performed in a traditional manner as well. To be electronically on-line line with a factory demands high volumes of sales, for which the Nordic market is considered to be too small.

The company has to send their base orders to their suppliers and plants with about 9 months of notice. The products are not sold when they are ordered, but in 9 months when the shoes are at the market, about 85% of the total orders are sold and delivered directly to the retailers. 15% of the orders are stored at the warehouse and are available for the retailers' additional orders.

Level of integration:
The level of integration between the suppliers and the company is not very high. The most integrated part is in the R&D level, before the production process. The level of integration between the retailers and the company are more in focus. In the future, the company hopes to get more of their orders

from the retailers on the Internet, and the orders will then go to the warehouse where they will fulfil the order without it passing through the company.

Production process:
Due to the long lead times, the production is based on a push-strategy. It takes 90 days after placing an order at a supplier before they can start the production process. Transportation time from Asia to Sweden is about 5 weeks, and terminal handling and documentation at the destination is not included in that time period. One option for turning the production around from a push-strategy to a pull-strategy could be to have a higher number of seasons. Flexibility and quick action will have to increase to be able to reach the right market at the right time. It will probably lead to higher sales figures, but smaller quantities for each and every product.

5.5 Estrella

Estrella is a part of the Kraft group and they produce, sell and market snack food products such as crisps, popcorn, peanuts, etc. They are also responsible for selling and marketing El Paso´s Mexican food products, but they do not produce this brand. Estrella sell their products to wholesalers who, in turn, sell them to retail stores, petrol stations, kiosks, etc. The market for their snack food is mainly in the Nordic countries, and they have production sites located in Denmark, Norway, Sweden and Finland.

In the following discussions we will only deal with the product category food snacks, which are produced by Estrella. We will discuss the inbound and outbound logistics to and from the production site in Göteborg.

5.5.1 Product requirements

Product characteristics:
The products are of low complexity and also of low value. The products can be classified as bulky cargo since it has a very low weight but requires a lot of space for handling and delivering. The volumes produced and delivered can be regarded as very large, due to the fact that the goods are of low value and very bulky.

The lifecycle of the products can vary greatly. The basic products such as salted peanuts or salted crisps have always been a part of the assortment and will probably continue to be so. Thus the life cycle for these products is very long. On the other hand, there are products that are released as news, and are only estimated to be out on the market for a certain period of time. Consequently, these products have a considerably shorter life cycle.

The demand structure of the products can be seen as rather volatile with some large fluctuations. New Years is the largest sales peak of the year and the production to cover this peak gradually starts in November. Other peaks occur whenever large events take place. Examples of this are the winter Olympics or a TV broadcast of the Eurovision Song Contest. Campaigns of various kinds at the retail stores are also done continuously to improve the sales. The size of the extra sales is, however, often difficult to predict. This is also the case of the other peaks, which are more or less possible to forecast, but the size of the peak can vary greatly.

Product Requirements:
The products do not demand any special treatment regarding handling, storing, packaging or transport. The finished products are stored at the production site and no other warehouses are used.

5.5.2 Customer requirements

Information flow/order procedure:
Information is mainly sent and received by the use of EDI messages. The aim is to exclusively use EDI as the information standard. The orders from the customers are done more or less automatically. When the stock level reaches a certain level at the wholesaler, they place an order with Estrella. The order is sent by EDI and automatically received and processed through the systems at Estrella, who then distributes the ordered goods.

Level of integration:
The integration level between Estrella and their customers can be regarded as high. Estrella has a few large customers with whom they are closely integrated. Also, the integration with their suppliers is high even though it can vary. The highest integration level they have is with their potato-suppliers, which are subcontractors to Estrella and only grow potato for them. Then there are suppliers who supply smaller volumes and work on shorter time-agreements. In these cases, the level of integration is not as high.

Production process:
When a new product is to be produced request bids are done to check several different suppliers. This procedure is also done occasionally for existing suppliers. For new products, it is also common that the suppliers are a part of the research and development phase and they can come with suggestions for new flavours and shapes, etc.

The order procedure for raw material into production is done from the production site and based on the production plan of what and how much is

going to be produced in the factory. The production plan is, in turn, based on sales forecasting that states the estimated sales for a certain time period. The estimated sales are then reduced by the amount existing in stock, and the net value equals the volume to be produced.

The suppliers are constantly provided with forecasts that have the aim to indicate in what direction the production is heading. When the actual order is placed with an exact quantity required, the suppliers have been more or less warned in advance. The production is done to forecast. There is a safety stock of both raw material and finished products.

The lead-time towards the customers is between 2-3 days depending on the geographical location of the customer. The lead-time is calculated from the time the order is received to the time the products are delivered at the customer's location. Demands on time windows exist even though they are not common, but there are customers who require the goods within the time span of one hour. The lead-time from the suppliers varies depending on the location. The suppliers overseas have an approximate lead-time of two weeks, mainly due to the slow boat transports.

5.6 Atlet AB

The company was founded in 1958 and is a family owned and managed company. The products they produce are customised and specialised trucks, and today they are the fourth largest producer in Europe. The production sites are located in Sweden and in Germany. Semi-finished components are bought and the main work done at the production sites is assembly of these components. There are 900 employees and the company is represented in over 30 countries, but the head office as well as the R&D division is in Mölnlycke. The main parts of their products are being leased out, not sold.

The suppliers are from Europe and low wage countries and the customers are mainly in distribution and commodity companies and are located in most parts of the world.

The logistical flows we have focused on are the information and product flow from the different suppliers to the assembly in Mölnlycke.

5.6.1 Product requirements

Product characteristics:

Trucks can be considered as products of rather high complexity level with a high value. Atlet, however, purchases all their components by their suppliers and the main work done in the factory is assembly of the trucks, welding and

painting. Both the value and complexity of the products, of course, varies within a certain range since a large number of different models of trucks are provided. The trucks are heavy and require a large amount of space when transported.

The life cycle of the products is relatively long, and completely new models with new platforms are produced every 7^{th}-10^{th} year. New upgraded versions of old models are, however, developed almost every year. A new truck is not bought because a new model has entered the market. It is not until the old truck is worn out that a new one is bought. This depends to a great extent on how much the truck is used. Normally a truck lasts for 10-15 years.

The demand for trucks can be seen as fairly stable without any large fluctuations between high and low peaks. It is though quite dependent on the state of the global market.

Product Requirements:

Due to the high weight of the trucks certain special requirements exist for the handling of the trucks. The loading and unloading are critical points in the handling when scratches and other damages easily occur on the trucks since they do not have any covering during the transport. There is no storing of finished goods; the trucks are transported directly from the production site to the buyers. The direct transport is a requirement decided by the manufacturer who wants to remain in control of the products all the way until it reaches the end consumer.

For some components in the truck there are demands on the ability to trace back the products to the original batch.

5.6.2 Customer requirements

Information flow/order procedure:

A customer order to the truck company is carried out through an Atlet sales person. The order is not allowed to be more than two days old before it is transferred to the affected suppliers via the truck company's MPS (Material Planning system).

The company has about 200 suppliers and 100 of them are so called active suppliers. Today they have 20 suppliers connected with EDI. The Odette standard is being used since many of the suppliers also are suppliers to automotive companies. The Odette standard is well adapted among the suppliers and sub-suppliers to the automotive companies, so other industries are being affected of this choice of standard as well.

A goal for Atlet is to use EDI communication with 70 of their suppliers, and to use the Internet with the remaining. The order will be sent off in both of the mentioned possibilities, and thereafter be converted into the variant the suppliers are processing.

Level of integration:
There are two levels of integration between the truck company and their suppliers. The first level is before production. During that phase the affected companies have a careful research and development process.

The second level is during production. During that period they have a lower degree of integration. The truck company gives instructions via EDI, and is very particular to keep the total responsibility and the full control over the total process, (i.e. the total process from the suppliers to the end customer).

Production process:
The truck company works with a pull strategy, where production is made exclusively to order. This means that nothing is produced unless there is an order for the product. A lot of what is being produced is specially designed for a specific customer. There is really nothing being stored before customer delivery. There are safety stocks on the material that are due to production line.

5.7 Husqvarna AB

The history of Husqvarna goes back to 1689 when the company was founded. They started by producing rifles, but today they produce "Professional Outdoor products" such as saw & clearing machines, lawnmowers and cross cutters. Since 1978 the company is a part of the Electrolux group, and has about 2000 employees. The production lines as well as the R&D department are situated in the city of Husqvarna. There are about 2500 different kinds of Outdoor products being produced for the different geographical markets.

The products are focused on professionals and reach the markets through the companies own retailers, and about 95% off the produced products are exported. The products are sold in most places of the world, but a big export market is the USA.

We have focused on the logistical flow between the suppliers and the production facility, but also on the flow between the retailers and production.

5.7.1 Product requirements

Product characteristics:

The products are of high complexity and the value of the products is also rather high. The chainsaws are not considered as bulky cargo while the cross cutters is more bulky since the shape is such that it does not allow an optimal way of storing and, thus, takes up much space.

The life cycle of these products have been shortened during the last years, from being used for ten years to a shorter and shorter time. This is partly a result of stricter regulations regarding the emissions and partly due to the fact that chainsaws are more and more becoming a consumer product that is replaced if a new model is released on the market.

The demand structure is relatively even throughout the year without any major fluctuations. A contributing factor to the even demand is the large amount of exported goods, which means that seasons are levelled out in a positive way.

Product Requirements:

The chainsaws are easily stored in the production plant and do not require any special handling. The cross cutters, on the other hand are bulky and, therefore, difficult to store within the production plant since it requires quite a large space. The cross cutters are also more sensitive to damages during transport and a special corrugated cardboard had been implemented as wrapping to reduce the damages, which has turned out to be successful. For the inbound transports, Husqvarna provides the transportation vehicles that drive around to both the nearby suppliers on a fixed schedule and suppliers outside the country to pick up deliveries to the factory.

A users manual always comes with the product and these are printed at the production site. The company that prints the manuals is located in the production area. One day in advance instructions are given regarding what model the instructions are for and what language is to be used. The short advance notce is to reduce unnecessary printing. The labelling of the finished goods is done automatically at the time of packaging.

5.7.2 Customer requirements

Information flow/order procedure:

The information exchange is carried out mainly through EDI, Odette standard, fax and sometimes through e-mail. These ways of communicating are used for subsidiaries, retailers and suppliers.

Every piece of an order that is being produced can be followed during the process like a track and trace system.

The order procedures can be followed in five steps:

1. The sales representatives gives a market analysis with a 12-month forecast.
2. A sales plan is developed based on the market analysis.
3. A main plan for production during the next coming month is done according to a rolling schedule.
4. The main plan leads to a production plan.
5. The production plan is the base for the delivery plan. The suppliers will get the production plans and two weeks in advance the order is finally locked. The delivery plan is updated continuously.

Level of integration:

The majority of the 290 suppliers are from Sweden, and it is mainly Husqvarna that has demands and give directions for development of a product. The supplier can come up with suggestions and advice after that. The development of a product is made in co-operation between the development, the logistical and the purchasing departments.

The tendency is to co-operate more with suppliers in low-cost countries, and this will probably affect the lead times and the level of quality in the future. It is also a challenge for companies to develop new ways of co-operating and delivery solutions.

Production process:

Production is based on a push-strategy and the products are produced to be stored at the different retailers. The end product is bought by a consumer on the spot, so the sales representatives needs to have the products in store. The different products are stored at the plant for packaging and transport consolidation to different customer in the same geographical areas. The minimum production for a specific product might also be higher than the order, which will lead to a consignor stock. There is a safety stock of components that are due to production line.

5.8 Nolato Gota AB

Nolato Gota AB is a supplier to Husqvarna, and the company produces polymer products (plastic products). They produce industrial components and no consumer products. Last year the Nolato group, which is a Swedish group of companies, acquired the company. Nolato Gota AB is situated in Götene where

the plant is situated, and there are about 100 people working there. The company is a supplier and a sub-supplier to several large Swedish exports companies.

Every detail that is produced is customised for a specific customer. Most of the customers are a few hours away, which is necessary since the company delivers to production lines. We have focused on the inbound and outbound logistics from the production plant.

5.8.1 Product requirements

Product characteristics:

The complexity of the actual products produced is low, while the equipment used for the production is very sophisticated. The value of the products is generally low, between 10-35 SEK a piece. Since the products are used for different purposes and comes in many different shapes and sizes, it is not possible to give a general view if whether the products are bulky goods or not. Boxes produced for refrigerators and freezers are extremely bulky and take up very large space related to the weight, while other products are much less bulky and not to be classified as bulky cargo.

Also, the life cycle of the plastic components is dependent on the life cycle of the products in which they are to be installed. In general, parts produced for the automotive industry tend to have shorter and shorter life cycles due to the constant changes in colours and models demanded.

The demand for Nolato Gota's products is relatively stable without any high peaks. The reason for this might be that they produce for different types of industries, which among themselves have different demand structures that result in an even demand for Nolato Gota. Another reason could also be that they do not produce and sell directly to consumers and, therefore, the changes in demand go through another actor before it reaches Nolato Gota.

Product Requirements:

There are no special handling requirements of the products, neither do the storing, transportation or packaging impose any special requirements. Some of the products, mainly the ones delivered to the automotive industry, have requirements that the articles should be traceable down to batch sizes of 5000 articles.

5.8.2 Customer requirements

Information flow/order procedure:

The communication between both suppliers and customers is performed in different ways through fax, letters and EDI. Since a lot of the providers and customers to the company also are providers to the automotive industry, the Odette standard is being used. EDI is being used but it is difficult to decide on one format, since quite a few versions are being used among customers and suppliers.

Orders from customers are being sent differently. The large customers have a continuously on-going base order. Some customers send EDI-files every night to up-date and confirm the base orders, while other customers do not send their order as frequently.

For infrequent products, they have to place a new order at the supplier every processing time. For high frequent products, a base order is placed and continuously up-dated. The orders the company sends to their providers are transferred at the end of every month. They inform the suppliers how much raw material they have used during that month, and the provider then knows how much material they will need in the coming month.

Level of integration:

The integration between the suppliers and the company is quite high. Most of the suppliers are in Sweden but might have their production process abroad. They have long-term relationships with their suppliers, and the 15 largest suppliers provide the company with 73% of their procurements. The integration between the suppliers and the company are, of course, different. In some cases, it is the suppliers responsibility to make sure that the level of material in stock always is satisfactory. When the supplier knows that the material for production is below the limit for safety stock, they automatically refill.

The level of integration between the company and their customers are increasing. The company has, for example, invested in a CAD-system in order to design and draw in co-operation with the customers. The company is also now involved in their customers R&D in an earlier stage than before. A reason for this is that the customers' products seem to have shorter PLC now than before.

Production process:

Production is based on a pull strategy. Nothing is being produced if it is not ordered. The press forms are quite costly and are owned by the customers, so nothing can be produced unless it is ordered. The turnover between two productions processes can take from ten minutes to several hours. It is only in

the case of small production order, that it might be more economical to produce more quantities than ordered.

The products that are produced are mainly delivered directly into a production line, and the deliveries can be as often as twice a day due to the volume of the products.

5.9 Shell

This is a global oil company, with R&D divisions in both England and France. The part of the company that we are looking at is the Nordic division for lubricates. There are about 1300 different articles. This is due to the many different areas were the oil is used (i.e. industrial use, aircraft's, passenger cars). Most of the lubricate oils are shipped from Helsingfors in Finland where it is refined, and are to be delivered to the Nordic countries. The raw material from the oil wells is shipped from the Nordic seas, as well as from other oil wells.

We look at the outbound logistical flow from the production plant, as well as the flow from the distribution centre to the customers.

5.9.1 Product requirements

Product characteristics:

The product itself is not of high complexity and the value is also low, 8-9 SEK/litre. The goods can be regarded as bulky cargo since the oil takes up large spaces when transported and stored.

Lubricating oil consists of many different types and Shell's total assortment consists of approximately 1300 different article numbers divided into 20 product groups. All articles can have three different wrappings and are also classified according to frequency. The A and B products are the most frequent and also the most strategically important. Therefore, these should always be kept in stock. The C products, on the other, hand have a low and unstable demand and are not to be stored. But if an order is placed of for example 20 litres, a purchase has to be made of a much larger quantity for example 4000 litres and this means that the abundance will be kept in stock.

The life cycle of lubricating oil is rather long. The oil can be stored for up to four years before it has to be tested again before being sold. External demands in the form of more strict environmental regulations forces a constant development of new products that can keep up with the regulations.

The total demand for lubricating oil has been more or less constant for the last 20-25 years in Europe. It is a product that the customers need to have, since all machine parts that are moveable do need lubricate. The demand for the different types of lubricate, however, has some peaks. During spring, the demand goes up for oils used within industries since they want to "buffer up" for the summer. A new peak occurs after the summer. During the summer, there is a peak of oil sold through the retailers at petrol stations, which consumers are buying lubricate for their cars.

Product Requirements:

There are no special requirements for the handling of the products. If, however, the package should breake and the oil leak, there are carefully designed instructions on how to deal with this. Recently they have been stored oil drums but now a specially designed packaging called "Fluid bags" is used as a complement. These bags contain 1000 litres.

An ability to trace the products down to the batch level is a requirement. This is also applicable for the oil that is bottled from an oil drum or fluid bag into smaller quantities. All products are also, as mentioned, required to be labelled with instructions for appropriate handling.

5.9.2 Customer requirements

Information flow/order procedure:

The company has a computer system that is homogeneous in all parts of the world where the company is represented. Each employee has a smart card that can be used in every company computer. The smart card transfers all files and information to the actual computer where the smart card is used. Many of the customers request to have one contact person, which puts a lot of demands on the computer system. The contact person will need to have access to all the different databases where all facts regarding the customer are available.

The customers gives the company one year preliminary order forecast, which is also based on historical orders. The customers send their orders via the Internet. The order goes straight to the distribution centre for sorting and delivering, and a copy of the same computer file goes to the company. There is one common distribution centre for the Nordic market.

When the company is ordering a product from the refinery, a duplicated file is automatically sent to their distribution centre. The order to the refinery is based on the customers forecasting orders and history.

Level of integration:
The level of integration between the customers and the company is rapidly progressing. Since their product is a fossil fuel, the external demands and changing requests put quite high pressure on the company and their customers. The demands from the society for R&D are forcing the actors to integrate and develop together. All machine parts that are moving or adjustable need lubricate, so the actors are mutually dependent on each other.

New techniques or new machinery might also request a new kind or a modified kind of lubricate. Many actors are involved in this product, and the environmental demands are increasing.

Production process:
Most of the products are produced with push-strategy with delivery to the distribution centre. It is only the least frequent products that are produced and delivered from a pull-strategy. The lead time depends on what product it is, but generally the lead time between the production start and time of delivery is about 6-8 weeks. The lead-time is measured from order point to delivery, but it is sequenced in different parts of lead-time. These different lead-time sequences are valuable in the creation of building up a customer profile as a platform for a distribution pattern. The customer profile is used for recommendations on the customer's delivery and procurement behaviour.

5.10 Logistical awareness

In addition to the empirical information stated so far, we have also gained some information that is of a more general logistical character. These observations are not stated in the interview guide and are more of non-measurable values, but as we still consider them as quite important and relevant for the outline of this paper we will briefly mention them here.

While interviewing and talking to the different companies, we noticed that the logistical awareness among the companies is widely spread. By logistical awareness we mean the companies' way of being an active part in the logistical activities and their awareness of their potential impact on the different logistical flows. The range between the companies varies from a very operative approach and seeing logistics as merely a necessary range of costs, to a more strategic way of approaching logistics and seeing logistics as a large marketing and competitive factor with high developing possibilities.We consider the logistical awareness to have an important impact on the company's logistical requirements and demands. The higher awareness, the higher demands and requirements a company has.

The automotive industry is an industry known to have developed and implemented most supply chain solutions and logistical developments. This also seems to have affected other industries, both directly connected and indirectly connected to the automotive industry. Our observation is that companies that are partly or directly related to the automotive industry tend to have a higher logistical awareness and also a higher developing intention.

6 ANALYSIS, CONCLUSIONS AND RECOMMENDATIONS

In this chapter, we analyse the empirical facts we have collected and present the conclusions of our research. The conclusions are presented in the form of a segmentation model. In connection to the model, we also have some explanatory text. Finally, we give some recommendations based on the information gained in the pre and main study, as well as in our theoretical research.

6.1 Background to Segmentation

As stated in the problem analysis, logistical requirements consist of different areas, outer requirements, product requirements and customer requirements. The outer and product requirements are seen as basic logistic requirements and the customer requirements are seen as value adding. We have seen that the basic logistics have to be fulfilled in order to be able to satisfy the value added logistics in the form of customer requirements.

Hence, the basic logistics are to be seen as the basis of the customers' requirements and this base is then extended with the value-added logistics in the form of customer requirements. The basic logistics are just as important as the value-added logistics, since the fulfilment of these are the prerequisite for any chance of being able to fulfil the value-added logistical requirements. The value-added logistics/customer requirements are, however, more interesting to look closer at in our case and it is these requirements that will be used as a basis for the segmentation we will make.

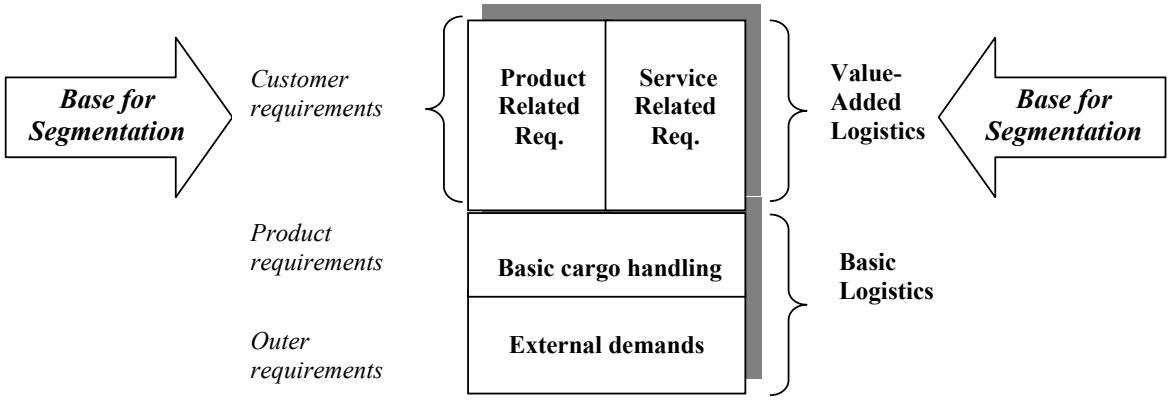

Figure 17: Focus on Customer Requirements/Value-Added Logistics

There are several reasons for the concentration on customer requirements. To begin with, we can see that the basic logistical requirements are most often fundamental and rather obvious. The TPL provider is more or less expected to be able to fulfil these demands and, therefore, it is more interesting to look at the value-adding requirements. Secondly, we can see that the largest development potential is in the value-adding requirements and we believe that this area will grow in importance in the future. Finally, it is with the value-added services that the TPL providers have the possibilities of positioning themselves and competing.

6.2 The Segmentation Model

We have now decided on what area of logistical requirements to focus the segmentation, now we move on to describe the model that is used for the segmentation. This will be done in two stages: first by showing the two axes of the model and explaining the meaning of them. Thereafter, we place the interviewed companies in the model and they will form segments. First of all, we look at how the model is meant to be used.

6.2.1 The Use of the Segmentation Model

When developing the model, our aim has been to find the right balance between making a too generalised model and a model that is too detailed. The result is a segmentation model that we believe has the right level of standardisation to make identification of different segments possible.

The segmentation model is meant to be used as a tool to be better able to structure and analyse the TPL customers' logistical requirements. The model helps us to see the focus of the requirements. If it is on the product related requirements, one can expect that special competence related to the product might be needed. If the focus instead is on the service related requirements, a more general logistics competence is likely to be needed. Special logistical knowledge about the company and its industry is needed to be able to provide the logistical services that add value for that particular company. The service related requirements are also often what creates a competitive advantage for the customer. It is, therefore, important that a TPL provider has a good competence and good knowledge of the industry and its special requirements to be able to provide the right services that creates this competitive advantage.

The model is created in a way that is applicable for all companies and it can be used for placing other potential TPL customers, in to the segments.

We do not, however, try to give a complete view of all existing TPL customers' requirements with our segmentation model. That would be impossible. The

result of the segmentation is based on the study made for this thesis. Therefore it is influenced by the prerequisites and the scope of the study. So, due to the restraints in the scope and time of the study, there might be existing segments that we did not find in our study and that are not shown in the model.

Further, the model does not show the logistical requirements that consist of the basic logistic requirements in form of outer and product requirements, as discussed earlier. These are the requirements that are more or less non-negotiable and set by the external environment and the product itself. Thus, companies that are placed in the same segment in the model due to similar customer requirements might have different underlying outer and product requirements. One needs to be aware of this fact when studying the model.

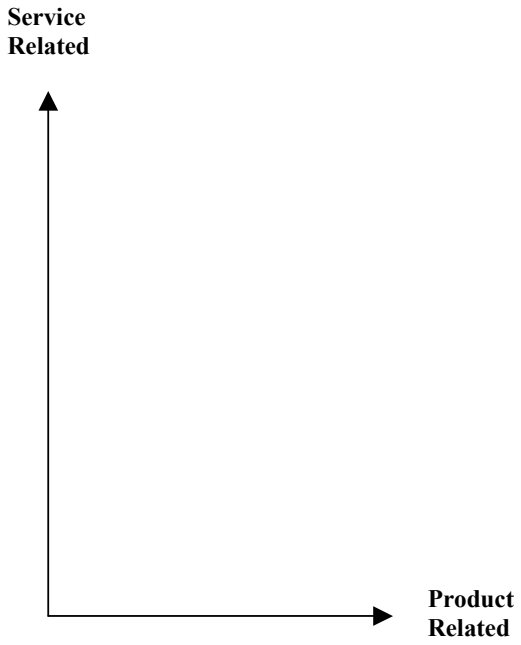

Figure 18: The Axes of the Segmentation Model

6.2.2 The Axes

In the segmentation model, the customer requirements are illustrated with two different axes, one representing the product related requirements and the other the service related requirements. The axes also show the existence of different levels of complexity of the product and the service related requirements. Furthermore these two axes come to represent different aspects of the customer requirements, operational and tactic aspects.

The product related requirements correspond to the operational aspect. In our case, this aspect deals with the physical concrete handling of the products. It can contain everything from simple activities, such as basic terminal handling,

consolidation of products and change of wrapping, to more complex activities that require a higher degree of competence, as for instance the final assembly of the product.

The service related requirements correspond to the tactic aspect. In this model, this axis represents the part of the customer requirements that include all the activities that add value, but not by handling or refinement of the product. Examples include everything from control of information flow and inventory management, down to quality controls and conventional carrier handling.

There are also strategic aspects of the customer requirements. The strategic issues are the more abstract aspects of the customer requirements and can, for instance, be design of the logistical structure and decisions on what processes are to be part of the system. Pro-activeness in the form of a constant effort to achieve development and improvements can also be seen as a strategic aspect. These aspects are important to consider but are not included in the segmentation model. In our study we have not covered this area enough to be able to draw any conclusions.

6.2.3 The Arrows

In the second model, each segment has arrows included in the circles. These arrows have the purpose of illustrating the possible direction of development for the segment. The wide arrows are to illustrate that there is a large potential for development in that particular direction. The narrow arrows show that there is potential for development in that particular direction, but that the potential is small.

6.2.4 The size of the Segments

As can be seen in the model, one of the circles is larger than the other two. This is just to illustrate the dispersion of the companies in the research. Using our research as the basis, one segment is larger than the other two since it contains four companies while there are only two companies each in the other segments.

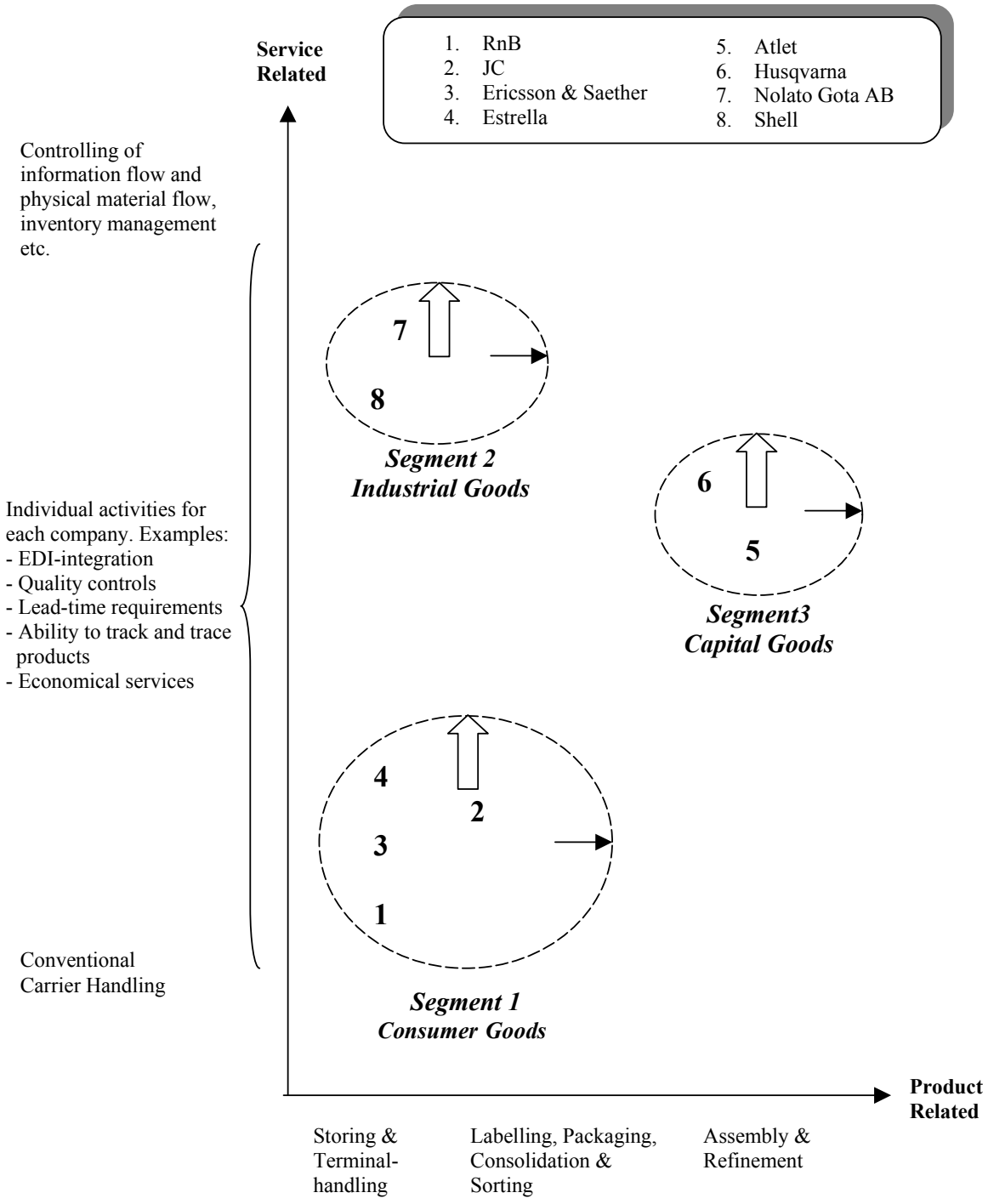

Figure 19: Segmentation Model

6.3 Characteristics of the Segments

The model serves as our tool for a segmentation of the companies we have interviewed. The companies are placed in the model according to their different levels of product related customer requirements and service related customer requirements.

As we can see in the segmentation model above, the companies can be grouped into three different segments, each with different characteristics. We shall now describe these three segments and look at what characterises them. The discussion is done based on the customer requirements that are used in the model and the product related requirements and the service related requirements are dealt with separately. In connection to each segment we also mention the development potential for the segment. The main characteristics for each segment are shown in the table below, which is followed by a further description and discussion related to each segment.

Segment	Product Type	Market	Product Related Requirements	Service Related Requirements
Consumer Goods	Low Complexity Low Value	B2C	Terminal Handling Storing Consolidation Sorting	Conventional Carrier Handling
Industrial Goods	Low Complexity Low Value	B2B	Terminal Handling Storing Consolidation Sorting	Conventional Carrier Handling EDI Communication Automatic Ordering Lead-time Requirements Consignor Stock
Capital Goods	High Complexity High Value	B2B & B2C	Terminal Handling Storing Consolidation Sorting Consignor Stock Assembly	Conventional Carrier Handling EDI Communication Quality Controls Kan-Ban Deliveries Lead-time Requirements

Figure 20: Characteristics of the Segments

6.3.1 Segment 1 – Consumer Goods

The first segment we have chosen to call Consumer Goods and it mainly deals with outbound logistics. Except for the characteristics mentioned in figure 20

most of the companies are also dealing with large sales volumes. This is especially the case for Estrella. Further, all the companies in this segment are also working according to a push-strategy, i.e. they are producing to forecast without knowing the exact demand when starting production.

Since the products are of low complexity and low value, it is neither possible nor worth refining the product or packaging to any larger extent. Therefore, the product related requirements on the operational axis are not very high. JC, as we can see, is placed further to the right on the axis and the reason for this is that they have developed their requirements for sorting the goods. The demands on sorting the goods varies depending on the length the product life cycle (PLC). The high fashion goods with a short PLC are sorted directly at the production site and then more or less sent directly out to the retailers, while the products with long PLC are sent in large batches to the central warehouse, where they are dispatched and stored waiting a refill order.

On the vertical axis, which shows the service related requirements, this segment is located rather low and the requirements are quite basic. Companies in this segment demand basic conventional carrier handling of the cargo, which can include issuing and handling of transport documents, such as bill of ladings and customs declarations. The companies placed higher on the axis, Estrella and JC, have developed their service related requirements somewhat more. Estrella is the only one within this segment that is using EDI communication. They also have demands on being able to trace back sold products and they have a high level of integration with their customers, which also is true for JC. JC has, for instance, developed an intranet for their retailers, where they can buy and sell online amongst themselves without any extra administration. JC has also realised that products with different PLC demand different supply chains and therefore uses different procedures for different products. This makes them more advanced than the other fashion companies.

This segment clearly shows that companies from different industries can have the same logistical requirements, at least regarding the customer requirements. Here we can see Estrella placed together with three fashion companies and all of them have similar requirements.

Further, the segment shows that companies within the same industry can have different requirements. JC and RnB are both fashion companies but in the figure are located at different borders within the segment. Thus, they have differences in their requirements, even though they are not very large.

6.3.1.1 Potential Development of the Consumer Goods Segment

This segment has the potential to develop and grow on both the operational level as well as on the tactical level. The development possibilities of the operational activities focusing on the handling of the product are, however, limited. JC has reached furthest in this development and other services are possible. To reach to the far right and have requirements on assembly and actual refinement of the product might be difficult, since the products are of low value and often produced in low-cost countries. It would simply not be cost efficient to postpone the production to the Nordic countries where labour costs are higher.

The main potential for development is, therefore, in service related activities. Since these activities are loosely connected to the type of product and not dependent on product type, they can be developed greatly with no actual limits. The only limit we have found is the logistical maturity within the company and the willingness to develop. As we have seen, a company with a low maturity often sees logistics merely as a cost and is, therefore, unwilling to put money and effort in developing the logistic processes. A company with high maturity, on the other hand, sees logistics as an opportunity to reach competitive advantage and is open and willing to invest in development of the logistics. It is important to be aware of this fact.

6.3.2 Segment 2 – Industrial Goods

This segment we have called Industrial Goods and this is partly due to the fact that these companies are acting mainly B2B (Business to Business). The main focus for the companies in this segment is on inbound logistics.

Just like the first segment, these companies have low requirements regarding the product handling and it is difficult to find ways to add value by refining the product. Therefore, this segment is located far left on the horizontal axis. In the case of Shell, activities such as dispatching into smaller units are demanded and, therefore, they are placed further to the right.

When it comes to the service related requirements, this segment differs greatly from the segment of consumer goods. The companies in this second segment have more developed requirements than the conventional carrier handling of transport documents and orders.

Also, this segments contains companies from different industries, Shell being in the chemical industry and Nolato Gota AB in the polymer industry.

6.3.2.1 Potential Development of the industrial Goods Segment

Also, this segment has the largest possibilities for development of the service related activities. The companies in this segment already have well developed service related requirements, but they can still be further expanded. Integration can, for example, be extended and the information flow can be improved and made more efficient. The logistical maturity is not of as high importance here since if a company is part of this segment it is most likely that they have a high maturity and consider logistics as an opportunity rather than a cost.

As in the first segment, development of the operational activities related to the actual product are more or less restricted. It is difficult to add value by product handling It is, for example, not possible to assemble or refine the oil Shell is providing. Nolato Gota can, however, pass over one level and reach to the right end of the operational axis by having assembly requirements. The pre-requisite for this assembly to be possible is that the products of another sub-supplier are used for assembly together with Nolato Gota's product.

6.3.3 Segment 3 – Capital Goods

The third and last segment is named Capital Goods and these products are sold both B2B and B2C. Atlet sells their trucks only to companies but Husqvarna is working both B2B and B2C. The main part of their products are sold through special retailers who focus on professionals in the industry but a small part is also sold to "regular" private consumers. Unlike the two other segments, the products in this segment are characterised by having a high level of complexity and also a high value.

The high complexity and value of the product leads to high product related requirements. A complete refinement of the product might be difficult due to the high and specialised competence that is needed, but it is possible. Requirements on assembly is more likely.

Atlet, has passed over one level on the axis by not having requirements on sorting and packaging of the product, which is the case for Husqvarna. Husqvarna requires special packaging for their products and they also require a special manual to go with each and every package.

The segment also reaches high on the vertical axis since the demand on the service is rather developed. Both companies in the segment have high service related requirements but they are somewhat different. Atlet is a company with a stable demand that only producess directly to order and delivers relatively small quantities per year. Their customers do not have any demands on quick lead times but instead they are very demanding regarding high quality of the

products. This, in turn, means that Atlet's requirements consist of quality controls and a close integration with their suppliers. Time is not of as high importance. For Husqvarna, on the other hand, lead-time is of high importance and the requirements are therefore focused on time reduction. A high integration with suppliers is also required here, but for the reason of shortening lead times. Further, there are requirements on Kan-Ban deliveries into production.

6.3.3.1 Potential Development of the Capital Goods Segment

This segment is located rather high on both axes, but still has potential to develop. Like the other two segments, the main possibilities for development are on the tactic axis by extending and improving the service related activities. It is possible to refine the product, but this demands high and specialised competence of the specific products, which makes it difficult. After refinement there is a definite limit. No further activities are possible.

The service related activities, on the other hand, have no actual limit in development possibilities. The logistical maturity within this segment resembles that of segment two; it is generally high and logistics are seen as a competition tool. The main area with the highest development potential thus is also the service related requirements.

6.4 Conclusions

In this section we shall return to Chapter 1 and tie together the problem, purpose and goal with the outcome of the study. Have we found answers to the main- and sub problems? Is the purpose fulfilled? Have we reached our goal? These questions will now be given answers.

To refresh our memory, we will again state the problem definition, the purpose and the goal of this thesis and, thereafter, state the conclusions we have been able to make.

Main problem: *The need for better knowledge and understanding, regarding the TPL customers' logistical requirements in the different traditional industries.*

Sub problem 1-3:
1) *What are the main logistical demands and requirements the customers have?*
2) *Are there customer similarities in the logistical requirements in the different industrial areas?*
3) *Are there customer dissimilarities in the logistical requirements in the different industrial areas?*

Answers to sub problems:

1) It is difficult to determine the most important logistical requirements. We have made a division of logistical requirements into outer, product and customer requirements and our opinion is that all the requirements are integrated and have equal importance.
2) Our study shows that customers in different industries can have similar logistical requirements. At least regarding the customer requirements.
3) Our study also shows tendencies that customers in the same industry can have different logistical requirements.

Answer to main problem:

By proving that factors other than industry belonging can be used for segmentation, we consider this thesis to contribute to a better understanding of the different industries.

Since we have been able to deal with the main problem, we also have fulfilled the purpose of this thesis "*to gain a better understanding of the different industries that exist"*. The purpose was further to "*map the logistical requirements of the TPL customers"*. This purpose is also fulfilled since we have been able to map the logistical requirements by structuring them into three different areas and by creating a model for segmentation.

Finally, the goal of this thesis has been as follows: "*to create a tool that will help Schenker to segment their existing and potential TPL customers"*. We have been able to accomplish this. The segmentation model can, as mentioned, be used on all types of TPL customers, existing as well as new and potential.

6.5 Recommendations

To conclude this thesis, we make two main recommendations that are important to remember when working with the requirements of a TPL customer. First, we discovered that the main area for development is the service related requirements. Secondly, we make some recommendations on how to build the trust of TPL customer and the best way to a approach the requirements of a TPL customer.

6.5.1 Focus Development on Service Related Requirements

After analysing the result of the segmentation, we can see that depending on product type, the product related requirements could be limited and more or less impossible to develop further. This axis also has a definite end-point. Instead, we see the service related requirements as the main area for development. All the companies in the study, independent of industry, product

type, company size and location in supply chain, have been shown to have the potential to develop the requirements of the service activities.

This conclusion that the focus of development is on the tactic axis is in line with the studies made by Andersson. He predicts that, in the future, the tactical and strategic issues will grow in importance and that higher demands will be put on the TPL providers in these areas. Today, the main focus is seen to be on the operational level and it is the customers themselves who to a great extent take responsibility for the tactic and strategic activities.

We have also seen Tarkowski et al emphasising the importance of seeing the operational, tactic and strategic issues as interdependent and not as isolated parts. Thus, we can conclude that all the three different aspects of the customer requirements are of importance and that it is more than just the operational aspects that need to be fulfilled. Instead the future mainly lies in the development of the tactic aspects, but also in strategic development.

6.5.2 Build Trust from the Base

In our study, we experienced some reluctance to outsource activities other than operational ones that deals with the physical handling of the products. We have seen that there is a tendency that companies fear they will lose control if the more complex activities on a tactic and strategic level are outsourced to a TPL provider. Further, the companies are sometimes sceptical of, and question whether the competence of the TPL provider is sufficient and if the TPL provider can perform the activities just as well, or better than the company itself.

To overcome this scepticism and reluctance to outsource we believe that it is of high importance to build confidence in the TPL providers with the customers. A good way of doing this is to follow the way described by Coyle. He claims that the TPL provider needs to start building the confidence at a base level by performing basic services well and thereby establishing a trust between the parties. This trust then opens up the way for expanding the services with more complex services, step by step. We very much believe in this reasoning. In our opinion, it is difficult to overcome the TPL customers' scepticism at once by trying to fulfil a large scope of their requirements at once. First, a relationship needs to be established where the TPL provider can assure the customer of having the right competence and, thereafter, the more complex activities, such as tactic and strategic issues can be performed.

If we relate this discussion to the segmentation model, we can see that it is more complicated for a TPL provider to enter into a relationship with

customers in Segment 3, than if they enter into a relationship with a company in Segment 1. We believe that it is difficult to try and fulfil all the requirements of Segment 3 at once. Instead, the relationship has to begin with providing some of the required activities. Then, when a mutual trust is formed and the TPL provider better knows the customer, the relationship can expand.

To become a TPL provider to a company in Segment 1 is easier. The requirement of the customer are possible to fulfil at an early stage and then the TPL provider can grow and develop together with the company. This way the two parties will become highly integrated since they grow together.

6.6 Further Research and The Future

We have in our thesis illustrated one way of segmenting the TPL market and this gives a good base for further studies and researches. One development possibility is to extend our segmentation model on page 73 by adding one axis and turning the diagram into a cube with three dimensions. The operational, and tactic axes will then be completed with a strategic axis.

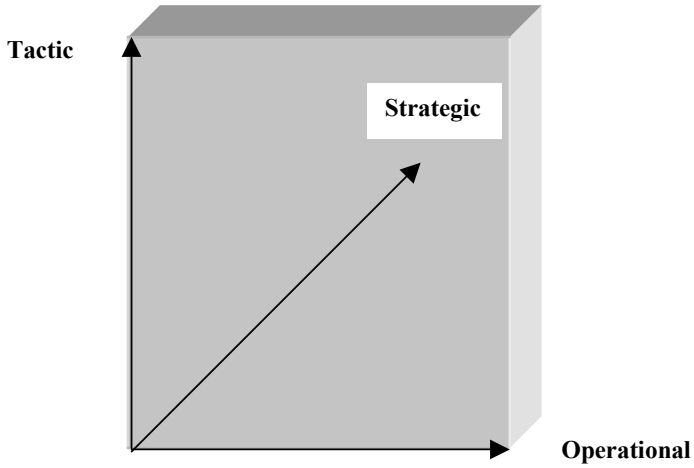

Figure 21: Development for Further Research

The strategic axis will stand for the designing and development of the total logistical flow or parts of the logistical flow. When the logistical awareness will increase among companies their logistical requirements will also be increased. We think the strategic requirements will be a possible development in the TPL market, and that it, therefore, is a good subject for further research.

The TPL industry is still in an introductory and developmental stage. A lot of thoughts and theoretical aspects are still only thoughts, and are not implemented on either the tactical or operational levels. There are many actors

that need to be on the same level of awareness to develop and perform logistical solutions.

It is our belief that there will be new and interesting developments and solutions in the TPL industry in the future and this will result in new thoughts and solutions.

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Appendix 1 - Explanatory notes

The following definitions are used in this thesis.

Bulky Cargo	When the dimensions (cubic meters ex.1 m3 = 250 kg.) of the cargo is of higher weight than the actual gross weight of the cargo.
CAD-system	Computer Aided Design
Consignor Stock	(In Swedish konsignations lager) An outsourcing term, which means that the supplier has a stock at the customer's premises, but the owner, is the supplier until the product goes into the customers production line.
Core Competence	set of skills that are important for a company's long-term competitive ability
Cross-Docking	A term for minimising the terminal handling of the cargo when changing transport vehicle.
EAN-barcode system	Barcoding refers to the placement of computer readable codes on items, cartons, containers, and even railcars. The primary purpose for these barcodes is to uniquely identify a product and manufacturer for retail checkout and tracking purposes. EAN stands for: The European Article Numbering System.
EDI	Electronic Data Interchange is identified as an intercompany computer-to-computer exchange of business documents in standard formats.
JIT	Just In Time. Focuses on moving materials and components in the exact quantity, at the exact time, to where the material is required.
Kan-Ban	An information system materialized in cards that are used as orders of material between the different production stages.
Lead-Time	Can be defined as the time between identification of a demand to satisfaction of that demand.

MPS	Manufacturing Planning System, manufacturing requirements determine the master production schedule and manufacturing requirements plan (MRP).
Odette Standard	The automotive industries electronic data interchange standard (Organisation for Data Exchange by Tele Transmission in Europe)
Outsourcing	A trend to let a supplier do some or a part of a company's production.
Push Strategy	A push-system presses on prognosis based orders to production through the production line.
Pull Strategy	A pull-system sucks the material through the production.
R&D	Research & Development
SC	Supply chain, a chain of providing activities.
SCM	Supply Chain Management, The systematic & strategic co-ordination of the traditional business functions within the supply chain for the purpose of improving the long-term performance of the company & the supply chain.
SKU	Stock keeping Units
Time-Window	Delivery in a time-window means delivery between specified hours and minutes. E.g. 14:45-16:15. Not before or after this time.
Value-Adding Services	Services that add extra features, form or function to the basic service

Appendix 2 - Interview Guide

Product Requirements

- Product Characteristics
- Complexity of product
- Value of product
- Bulky Cargo
- Life Cycle of product
- Volumes/quantities produced
- Demand Structure

Product Requirements/ Customer Requirements (Product Related)

Special requirements for:

- Handling
- Storing
- Transport
- Packaging
- Documentation
- Labelling
- Consolidation
- of articles
- of boxes

Customer Requirements (Service Related)

- Information Flow
- How is information sent and received?
- How is the communication with the providers performed?
- What is the level of integration with suppliers and distributors?

Order Procedure

- How are the orders placed? Manually from production site or automatically or directly from retailers?

Suppliers

- What is the level of integration? How close is the cooperation? Do suppliers take part in R&D?
- Time of working agreement.

Production

- Push or Pull strategy?
- Production to order or production to stock?
- Production with safety stock or direct deliveries in to production?
- Lead time
- Reliability
- Flexibility
- Precision
- Short or long
- Coordinated
- Accessibility, need of close location of suppliers, supplyparks.

Logistical Research & Development

- If outsourcing to TPL provider, what is the main reason for this?
  (Cost savings, improved logistics, focusing on core competence?)

- How large part of the business is the company prepared to outsource?

- Do they prefer one provider of outsourced activities or do they accept several?