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Third-party logistics as a strategy to redesign distribution networks

- A case study of a healthcare company

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Master of Science Thesis in the Master Program of Supply Chain Management

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Preface

This master thesis has been written in cooperation with a Swedish healthcare company and been a part of the company's project to redesign their distribution network. The assignment has been to investigate if the company should outsource their European distribution to a 3PL provider or if they should keep the activities in-house. The case company has been the main focus of this thesis, but the arguments and methods that were developed could be used by other companies and contexts.

This thesis would not have been possible if it had not been for the help of our supervisor at the case company. Moreover, the examiner at the case company as well as other employees has been very helpful by answering our questions. We will also give a special thanks to Nikolai Kolderup-Finstad, who has given us of his own time and made an effort to help with a large part of this thesis. Last, but not least, we want to thank our supervisor and examiner Linea Kjellsdotter Ivert, who have been very helpful and given us motivation to make this thesis as good as possible.

Gothenburg the 8th of May 2014

Erik Claesson David Sandelind

Abstract

Companies are nowadays exposed to greater risks due to the globalization of the market, shorter product and technology life cycles and the increased use of partners within the manufacturing, distribution and logistics field, which on the whole result in complex international supply network relationships (Christopher *et al.*, 2002). Due to the continuous changes in the market, companies need to constantly review the design of their distribution networks to stay competitive (Chopra & Meindl, 2012). Distribution networks are defined by Chopra & Meindl (2012) as the different solutions a company have access to for *moving* and *storing* a product from their own facilities to the customer's location. As an alternative to redesigning a distribution network in-house, there is a possibility to outsource all, or a part, of the distribution to a logistics service provider. When outsourcing logistics operations, companies often turn to third-part logistics (3PL) providers. Lieb (1992, p. 29), states that 3PL involves "*the use of external companies to perform logistics functions that have traditionally been performed within an organization"* and that *"the functions performed by the third party can encompass the entire logistics process or selected activities within that process*". Mello *et al.* (2008), Andersson (1998) and Diabat *et al.* (2013) argues that the motives to outsource logistics services to 3PL providers are mainly cost reductions, improved service and a reduction of investments.

The purpose of this report is to develop decision support for a Swedish healthcare company, which is currently involved in a project that aims at redesigning their distribution network to decrease cost and tied up capital, regarding if their outbound distribution should be outsourced to 3PL providers or performed in-house. Moreover, the report provides knowledge on how to make a 3PL relationship successful.

In order to fulfill the purpose of this thesis, two research questions were formulated. The questions are:

1. *Which* company specific aspects affect the case company's decision to outsource or perform their outbound distribution in-house, and *how* are these aspects affecting the decision?

2. If the case company chooses to outsource their distribution, what can they do to make the 3PL arrangement as successful as possible with regard to their specific situation?

To be able to reach the purpose of this thesis, data have been collected from articles and books with the aim of obtaining information about logistics outsourcing. Moreover, an empirical study has been made by conducting interviews and sending out questionnaires to selected companies. The data from this study were analyzed to build up arguments in order to discuss the two research questions. The results from the arguments were that the company's distribution network contains too small warehouses to be able to reach the same economies of scale as a 3PL provider can. Moreover, no major risks with logistics outsourcing were found for the company. Therefore,

the case company is recommended to outsource their European distribution since it will reduce distribution costs. The result from the arguments did also indicate that if the company decides to outsource their distribution they are recommended to do it in the form of a partnership with one, or a few, 3PL providers. Further, the company is recommended to put a lot of effort into the supplier selection process, and to use long contract with built-in flexibility for the 3PL relationships.

Keywords: 3PL, third-party logistics, logistics outsourcing.

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1. Introduction

This chapter will cover the reason why this thesis will be performed both from an academic point of view, where the main problems regarding redesigning of distribution channels and outsourcing logistics services to a third party will be brought up, and a practical point of view, where the case study will be briefly introduced. Moreover, this section will state the purpose of the thesis, research questions will be formulated and the scope of the thesis will be described.

1.1 Background

The success or failure of a company is strongly dependent on the way its supply chain is designed and operated (Chopra & Meindl, 2012). Supply chain management is defined by Stadtler (2005, p. 11) "as *the task of integrating organizational units along a supply chain and coordinating material, information and financial flows in order to fulfill (ultimate) customer demands with the aim of improving the competitiveness of a supply chain as a whole"*. According to Christopher & Lee (2004), managing these supply chains are becoming increasingly challenging. Companies are exposed to greater risks due to the globalization of the market, shorter product and technology life cycles and the increased use of partners within the manufacturing, distribution and logistics field, which on the whole result in complex international supply network relationships (Christopher *et al.*, 2002). These trends are important for companies to consider when designing their supply chains and distribution networks. Distribution networks are defined by Chopra & Meindl (2012) as the different solutions a company have access to for *moving* and *storing* a product from their own facilities to the customer's location. Thus, the distribution network will in this thesis be defined as the part of the supply chain that handles outbound logistics from a company to consumers.

Due to the continuous changes in the market, companies need to constantly review the design of the distribution networks to stay competitive. Moreover, continuous development in technology within the logistics field has affected the way distribution networks could be composed (Chopra & Meindl, 2012). According to Chopra & Meindl (2012) the aim for companies to redesign distribution networks is to supply customers with products in the most efficient way possible. The way of doing this, is to try to fulfill the customers' needs while keeping the cost of meeting these needs as low as possible. The number of facilities, e.g. warehouses, that exists in a distribution network has a great impact on both of these dimensions. For example, if the customer requires a fast response time the need for more warehouses is greater. The number of warehouses also affects costs, in particular inventory costs, transportation costs and costs for the physical warehouses and associated handling. Abrahamsson (1993) adds a fourth cost that is affected by the number of warehouses in the distribution network. This one is called cost of lost sales, and is the direct revenue loss as well as the long-term cost for the company that is incurred when products cannot be delivered to the customers.

As an alternative to redesigning a distribution network in-house, there is a possibility to outsource all, or a part, of the distribution to a logistics service provider. According to Andersson (1998) and van Weele (2010), outsourcing in general is increasing, and has been for the last decades. Moreover, van Weele (2010) and Chopra & Meindl (2012) states that one part of companies' businesses that has been outsourced to a large extent is distribution, as a strategy to increase competitiveness. There are different events that can make a company consider logistics outsourcing. These are, for example, change in management structure or changed customer requirements (Mello *et al.,* 2008; Gadde & Hulthén, 2009).

Mello *et al.* (2008), Andersson (1998) and Diabat *et al.* (2013) argues that the motives to outsource logistics services are mainly cost reductions, improved service and a reduction of investments. The reason that the logistics service provider could do the job cheaper and better than the shipper is due to economies of scale and superior knowledge within the field, since it is their core business. Furthermore, Mello *et al.* (2008), Andersson (1998) and van Weele (2010) state that another motive to outsource parts of a company's business is to be able to focus on core business and outsource parts that another company could do better. Moreover, Andersson (1998) mention that another reason to outsource logistics services is to achieve a fast and radical restructuring of the supply chain. When a company is redesigning their distribution network, one alternative that should be investigated is therefore to outsource the distribution operations to a logistics service provider.

As discussed above, the distribution network has to be redesigned on a regular basis for a company to stay competitive. This creates a lot of work for the company and if the knowledge does not exist in-house, outside help will have to be bought. Moreover, van Weele (2010) states that an outsourcing decision could be a strategic decision that companies uses for a long time. Therefore, the option of outsourcing distribution is important to evaluate. The author also states that there are some risks that needs to be taken into consideration when taking an outsourcing decision, e.g. the risk of losing control or that the supplier fail to reach the contracted goals. Therefore, the outsourcing decision needs to be evaluated thoroughly, especially if it is a strategic long-term decision.

When outsourcing logistics operations, companies often turn to third-part logistics (3PL) providers. Lieb (1992, p. 29), states that 3PL involves *"the use of external companies to perform logistics functions that have traditionally been performed within an organization"* and that *"the functions performed by the third party can encompass the entire logistics process or selected activities within that proces*s". Chopra & Meindl (2012) state that some 3PL providers are supplying even broader services that goes beyond logistics. One example is 3PL providers that perform final assembly or manufacturing for their customers.

Outsourcing to 3PL providers has been increasing rapidly since the 1990s (Srabotizc & Ruzzier, 2012) and logistics outsourcing grew to a 390 billion USD business in 2007 with a double-digit growth (Mello *et al.,* 2008). However, the decision to outsource has been shown to not always be

done in systematical ways (Mello *et al.,* 2008). Instead personal factors, such as experience and self-interest, are often employed in the outsourcing process, resulting in rushed decisions (Mello *et al.,* 2008). Moreover, the decision to use a 3PL provider could be a consequence of companies that do not want to deal with logistics (Mello *et al.,* 2008). Many companies thereby underestimate the effort that 3PL relationship takes (Gadde & Hulthén, 2009), and fail as a result of improper management of the outsourcing relationship (Sahay & Mohan, 2006). An equally important phase in logistics outsourcing is to choose the right 3PL provider to work with. Sahay & Mohan (2006) mention that many 3PL partnerships fail as a result of improper provider selection. It is important that the choice of 3PL provider is adapted to the company's context (McGinnis *et al,* 1995) and that the values and the company culture of the supplier match the buyer's (Weiskott, 1999). Thereby, the characteristics of the product and the current design of the distribution network should be important factors in the selection phase (Marasco, 2008).

1.3 Case description

The case company is a Swedish healthcare company that is currently in a project that aims at redesigning their European distribution network to decrease cost and tied up capital, and at the same time be able to keep, or preferably increase, the service level. One option in this project is to outsource the whole distribution network to one or more 3PL providers. This is the option that this thesis will analyze. More information about the case study will be presented in section 4.1.

1.4 Purpose

The purpose of this report is to develop decision support for the case company regarding if their outbound distribution should be outsourced to 3PL providers or performed in-house. Moreover, the report should provide knowledge on how to make a 3PL relationship successful.

In order to fulfill the purpose of this thesis, two research questions have been formulated. The questions are:

1. *Which* company specific aspects affect the case company's decision to outsource or perform their outbound distribution in-house, and *how* are these aspects affecting the decision?

2. If the case company chooses to outsource their distribution, what can they do to make the 3PL arrangement as successful as possible with regard to their specific situation?

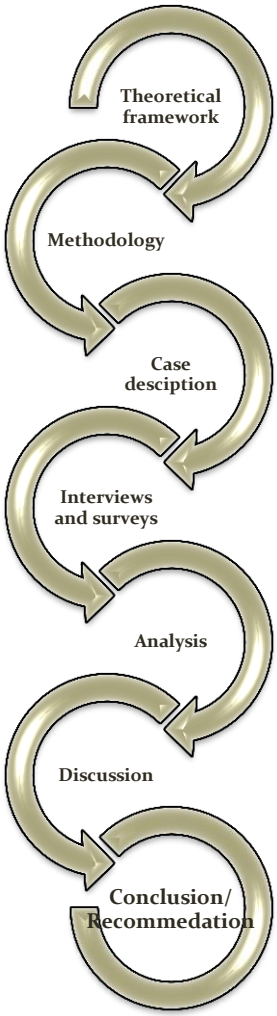
1.5 Scope & Limitations

The scope of this thesis is to develop decision support for the case company regarding the decision to outsource their outbound distribution instead of creating an in-house solution. The decision support will be in the form of a recommendation whether the company should evaluate the 3PL alternative more thoroughly or not. Hence, a 3PL solution ready for implementation will not be created. Moreover, the study will only focus on the European market, since the case company only wants to redesign their distribution network in Europe. The thesis will only focus on 3PL providers and no other logistics service providers. Furthermore, the thesis will focus on

outbound distribution network, i.e. the distribution from a company to their customers. Therefore inbound logistics and production logistics will not be taking into consideration.

1.5 Disposition

The first chapter of this report has introduced the subject of logistics, distribution and logistics outsourcing, as well as presented the purpose, the research questions and the scope of the thesis. The outline for the remaining part of the report will be presented below.



2. Theoretical framework

The theoretical framework will cover a literature review of distribution network design and logistics outsourcing, including the outsourcing process and the management of the relationship between the customer and the 3PL provider.

3. Methodology

The third chapter in this thesis will describe the methodology that was used during the work to reach the purpose, both by discussing the research strategy and by describing the work process. The way that data was collected and analyzed will also be presented.

4. Case description

In chapter four the case company will be described in more detail. Moreover, the case assignment, and input needed to analyze it, will be described.

5. Interviews and survey

Chapter five will present results from interviews and surveys. The data collected from the interviews and surveys consist of information from both a 3PL provider and companies experienced in outsourcing logistics services.

6. Analysis

Chapter six will analyze the collected data. The analysis will develop arguments to be able to answer the research questions.

7. Discussion

In the discussion the main findings from the analysis will be discussed by using the finding from the theoretical framework with regard to the case assignment. In this chapter the research questions will be discussed.

8. Conclusion and recommendation

This chapter will answer the purpose of this thesis. Moreover, recommendations will be given to the case company of how they should proceed.

2. Theoretical framework

The theoretical framework will include the topics of distribution network design, logistics outsourcing and the outsourcing process. Moreover, last in the chapter the analytical framework will be presented.

2.1 Distribution network design

This section will cover the design of the distribution network, i.e. the number and location of warehouses, as well as how the products themselves affect the distribution design.

2.1.1 Distribution network

When designing distribution networks, the aim is to supply customers with products in the most efficient way possible. According to Chopra & Meindl (2012), this is done by meeting the needs of the customers at the same time as keeping the cost of meeting these needs as low as possible. Chopra & Meindl (2012) mention that the customer needs that are affected by the distribution are; response time, product variety, product availability, customer experience, time to market, order visibility and returnability. The term product availability is more commonly expressed as the stock service level, which is defined by Jonsson & Mattson (2009) as "*the extent to which products can be delivered to the customer directly from stock*". Customers do not always need the highest service for all these factors, but it is up to the company to understand which needs that are important in their specific situation.

According to Mourits & Evers (1995), companies need to make a trade-off between the level of service offered and the associated cost of the distribution. The associated costs of the distribution are primarily fixed facility cost and transportation cost (ibid). The goal is therefore to determine the most cost efficient location and allocation of facilities such that all geographical customers are served satisfactorily. Chopra & Meindl (2012) go a step further and argue that the distribution network design and the number of warehouses affect mainly four types of supply chain costs. These are cost for inventories, transportation, facilities and handling. These supply chain costs are interrelated, which makes it crucial for companies to choose the solution that result in the lowest total distribution cost (ibid). For example, an increased number of warehouses result in that inventory cost, the cost for the physical warehouse and cost for associated handling increases. The reason why the inventory cost increases is because more inventories are needed to achieve the same stock service level (Chopra & Meindl, 2012). Further, more facilities result in higher cost for facilities and associated handling costs. So, for firms that target customers who can, for example, tolerate a long response time require only a few locations that may be far from the customers and can therefore also put more focus on increasing the capacity of each location. However, if the customer require fast response time the need for more warehouses is greater. An increase in warehouses also decreases transportation cost, since the customers can be served from a location closer to them which reduce the costly last mile delivery.

Abrahamsson (1993) adds an additional cost that affects the number of warehouses in the distribution network. This cost is called cost of lost sales and is the direct revenue loss as well as the long-term cost for the company that is incurred when products cannot be delivered to the customers. This cost decreases with the number of warehouses due to shorter distances from the warehouses to the customers. By adding all costs together a total distribution cost can be calculated which determines the optimal number, in theory, of warehouses in a distribution network. These arguments are illustrated in Figure 2.1.

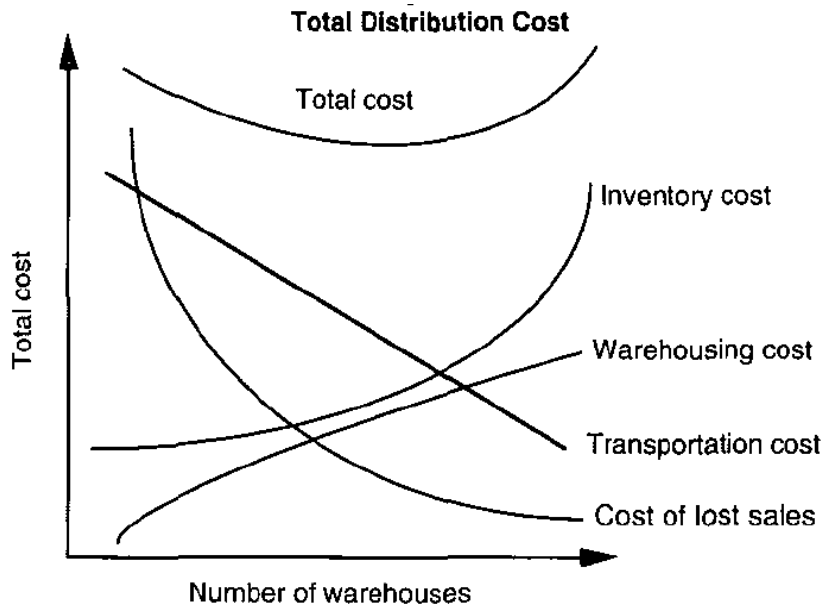


Figure 2.1 Distribution cost. Source: Abrahamsson (1993).

The traditional view of distribution design that was explained above seems to have changed to what is called "time-based distribution", where information technology has been an important driver (Abrahamsson, 1993). "Time-based distribution" has changed how the supply chain costs are related to the number of warehouses in the distribution network. Starting with the cost of transportation, which according to Figure 2.1 is decreasing proportionally with the number of warehouses, Abrahamsson (1993) shows that this cost does not have to be much higher when the number of warehouses is reduced. The reason for this is that fewer larger warehouses can achieve higher stock service level and thereby, to a higher extent, keep a complete assortment of products at all times. With several smaller warehouses, the possibility is greater that some products will be out of stock and this will be solved by sending express deliveries from a central warehouse or from the place of production. Express deliveries result in high transportation cost in relation to if smooth flows of shipments are made. The cost for transportation is also affected by the fact that the replenishment transportation to a central warehouse is more efficient than to smaller local ones. This is due to that it is easier to achieve a good fill rate in those shipments, according to the author. Moreover, due to the higher stock service level, the cost of lost sales will not have to increase if the distribution design is changed to fewer warehouses, since the customers will more likely receive the products they demand within the defined lead time (Abrahamsson, 1993). In

addition, centralization of stockholding commonly results in that the local sales functions and the centralized physical distribution are separated, and the customers can continue to be served by sales personnel locally (Abrahamsson, 1993). The new model for the distribution costs in relation to the number of warehouses is illustrated in Figure 2.2.

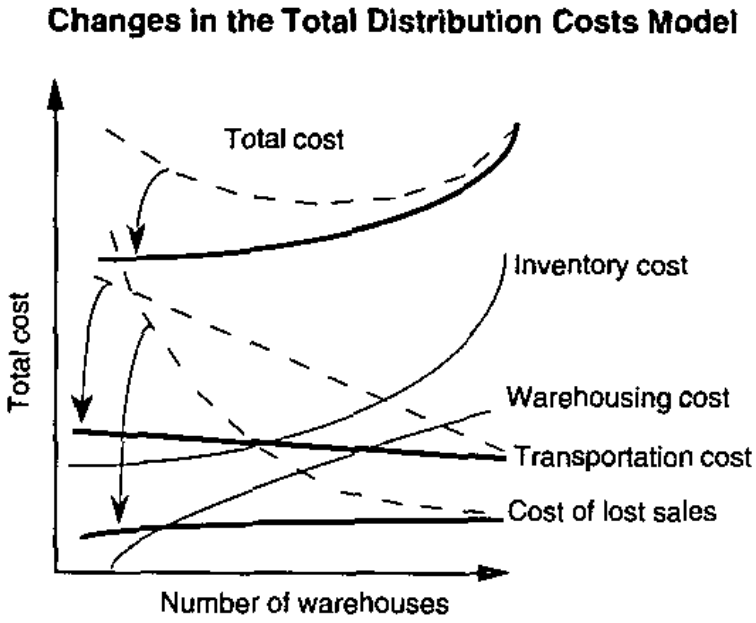


Figure 2.2 "Time-based distribution". Source: Abrahamsson (1993)

2.1.2 Product environment

The context of a company affects the design of their outbound distribution network. Fisher (1997) mentions that the distribution performance of many companies is low due to that their supply chains are not adapted to the characteristics and demands of the products they are producing. The author further mentions that the negative consequences of this are stock-outs and/or oversupply, both resulting in increased cost. Therefore, to be able to decide the distribution design, it is crucial to know the requirements imposed on the distribution. Fisher (1997) have developed a framework for deciding which supply chain that fits in which context. This framework takes into account, for example, the product life cycle, the demand predictability, the demand fluctuations, the product variety and different types of market standards, such as lead-time and service level. Chopra & Meindl (2012) add that the price and the rate of innovation in the product are also affecting the design of the supply chain. According to Fisher (1997), is it possible to divide all products in either primarily functional or innovative products. An example of a functional product is salt, which is sold in a wide range of retail stores and have stable demand, due to that it fulfills a basic need (Chopra & Meindl, 2012). Functional product generally do not change much over time and have long product life cycles, which result in that the demand is stable and predictable. However, this fairly stable environment invites competition, since the business can quite easily be copied by other companies. The competition also results in low profit margins.

To avoid low profit margins, many companies try to add innovative offerings to their products and thereby transforming it to an innovative product, resulting in less competition and higher profit margins (Fisher, 1997; Chopra & Meindl, 2012). However, Fisher (1997) mentions that innovative products also come with challenges. Due to the newness of the innovations, the unpredictability in demand increases. Moreover, the high profit margins will also attract competitors, resulting in that the companies need to invest in continuously introducing new products to the market. As a result, the life cycle of the products decreases and the unpredictability increases even further (Fisher, 1997). The characteristics of functional and innovative products are summarized in Table 2.1.

Table 2.1 Functional versus innovative products: Differences in demand. Source: Fisher (1997)

Aspects of demand	Functional (Predictable demand)	Innovative (Unpredictable demand
Product life cycle	More than 2 years	3 months to 1 year
Contribution margin	5% to 20%	20% to 60%
Product variety	Low (10 to 20 variants per category)	High (often millions of variants per category)
Average margin of error in the forecast at the time production is committed	10%	40% to 100%
Average stock-out rate	1% to 2%	10% to 40%
Average forced end-of-season mark down as percentage of full price	0%	10% to 25%
Lead time required for made-to-order products	6 months to 1 year	1 day to 2 weeks

According to Chopra & Meindl (2012), depending on whether the product is functional or innovative the supply chain should be either efficient or responsive, respectively. Furthermore, Fisher (1997) mentions that companies with innovative products should choose suppliers for speed and flexibility and firms that produce more functional products should focus more on cost. Thereby, for functional products with low profit margins, long product life cycles and low demand uncertainty, an efficient supply chain is the right choice. The company can then focus on decreasing the physical supply chain costs, including the cost for, for example, production and transportation. For supply chains with innovative products the focus should primarily be to decrease market-mediation costs, such as cost for obsolesce and that products need to be marked down. However, Chopra & Meindl (2012) mention that higher responsiveness contributes to increased costs, which requires a balance between responsive and efficient supply chains.

2.2 Logistics outsourcing

This section will cover the history and definitions of logistics outsourcing, third-party logistics, drivers for and against logistics outsourcing, as well as advantages, disadvantages, risks and opportunities with logistics outsourcing.

2.2.1 History and definitions

According to Deepen (2007), a company has three main options when it comes to logistics. These are to perform the activities in-house, to set up a logistics subsidiary, or to outsource the activities to an external supplier. Outsourcing refers to when a company agrees a contract with another company to provide services that was previously performed in-house (Rajesha *et al.*, 2013). Moreover, Logozar (2008) state that *"Outsourcing means transferring certain activities to specialized providers who can perform on a higher level"*. Logistics outsourcing, which originated in a larger scale in the 1980's, is defined by Lambert *et al.* (1999, p. 165) as *"the use of a third-party provider for all or part of an organization's logistics operations"* and mentioned by Gadde & Hulthén (2009) as a mean for companies to increase the efficiency of their supply chains. Therefore, logistics outsourcing will in this thesis refer to when all, or a part of, a company's logistics activities are outsourced to gain increased supply chain performance.

The most commonly outsourced logistics activities are transportation, warehousing and material handling (Deepen, 2007; Sahay & Mohan, 2006). However, today's globalized economy has resulted in more complex logistics activities, which are becoming too complex for many companies to handle (Deepen, 2007; Daim *et al.*, 2011). Logistics outsourcing have therefore grown in complexity and now includes even more services, e.g. value adding activities that have been bundled together (Azzi e*t al.*, 2010; Logozar, 2008; Selviaridis & Spring, 2008). Globalization has not only led to that more complex logistics services have been outsourced, but also to that more companies are outsourcing in general (Mello *et al.*, 2008; Anderson *et al.*, 2011). Moreover, Azzi e*t al.* (2010) argues that the increased competitive pressure for many companies today have led to that more companies have turned to logistics outsourcing. Other reasons that have resulted in an increase in logistics outsourcing are deregulation of the transportation industry, rising customer expectations on superior logistical service, growing focus of companies on core competencies, increasing popularity of just-in-time (JIT), and revolution in computers and communication technology (Marasco, 2008). The increased use of JIT and build-to-order strategies has also made logistics a more important and strategic issue (Gadde & Hulthén, 2009). Therefore, logistics outsourcing have become a strategic issue, as well.

Since the 1990s, the increase in logistics outsourcing has been great (Srabotic & Ruzzier, 2012). For example, Gadde & Hulthén (2009) and Azzi e*t al.* (2010) state that logistics outsourcing have been increasing 5-8% annually between 1996 and 2004. In 2002, logistics outsourcing was purchased for 56 billion USD (Onge, 2012), which can be compared to 2007, when logistics outsourcing was a 390 billion USD business with double-digit growth expected (Mello *et al.*, 2008). Further, in 2012, the global expenditures of logistics outsourcing services were about 670 billion USD (Langley *et al,* 2014). Regarding logistics outsourcing in Western Europe, 57% of all logistics expenditure was outsourced in 2005 (Deepen, 2007). This number rose to 66% in 2009, according to Langley Jr. *et*

al (2009). According to Deepen (2007), these numbers are expected to grow, although with a slower pace then what have been for the last decade. The author argues that the growth of outsourcing will probably stabilize soon, since the underlying logistics activities is not growing more than the global economy. This has already been shown in Europe, where logistics outsourcing have declined about 2.5% both 2010 and 2011 (Langley *et al,* 2014). Even though logistics outsourcing has grown in popularity, the actual benefits that result from it is not well documented (Gadde & Hulthén, 2009). The authors also state that the pitfalls of logistics outsourcing have not been the subject of that much research.

According to Deepen (2007), there are five types of logistics service providers. These are carriers, freight forwarders, courier & express & parcel/postal providers, 3PL providers and 4PL providers. 3PL providers, which are the focus in this thesis, will be discussed in more detail below.

2.2.2 Third-party logistics

3PL providers emerged in the early 1990s when companies such as DHL, UPS and TNT expanded their operations from transportation and warehousing to more complex logistics services (Gadde & Hulthén, 2009). That means that 3PL providers nowadays are usually associated with the offering of multiple, bundled services, rather than just isolated transport or warehousing functions (Leahy *et al.*, 1995). Today, 3PL providers can take care of a company's entire logistics process and perform services such as inventory management, warehousing operations, consolidation and packaging, transportation, logistics information systems and value adding services (Azzi e*t al.*, 2010; Xiu & Chen, 2012). According to Deepen (2007), 3PL providers can offer solutions that are customized to the specific customer. Moreover, Daim *et al.* (2011) states that *"large 3PL providers can essentially provide anything than can be thought of within the area of logistics management"* and that *"at a price, anything could be outsourced."* This is also the opinion of Deepen (2007), who argues that services which the 3PL provider cannot provide on its own is bought from another service provider to make sure that they are able to provide anything the customer asks for. Moreover, Power *et al.* (2007) argues that the 3PL industry nowadays offer more management oriented services than before. Burnson (2012) also states that the best 3PL providers use the latest management tools and IT systems such as Six sigma, Lean, warehouse management systems and transport management systems.

2.2.3 Drivers for and against logistics outsourcing

There are many different reasons, in this thesis referred to as drivers, why companies are turning to outsource logistics. The two most commonly cited drivers are cost reductions and improvements in logistics service levels (Mello *et al.*, 2008; Andersson, 1998; Diabat *et al.*, 2103; Rajesha *et al.*, 2013; Deepen, 2007; Sahay & Mohan, 2006; Logozar, 2008; Selviaridis & Spring, 2010; Xiu & Chen, 2012; McGinnis *et al.*, 1995; Anderson *et al.*, 2011), i.e. companies outsource logistics activities to 3PL providers because they think that the supplier can do the job both cheaper and better. Yet, another commonly cited driver to outsource logistics is that companies want to focus on their core business, and outsource the remaining activities (Mello *et al.*, 2008; Andersson, 1998; Diabat *et al.*, 2103; Azzi *et al.*, 2010; Rajesha *et al.*, 2013; Solakivi *et al.*, 2011; Deepen, 2007; Weiskott, 1999; Logozar, 2008). Apart from these three main factors there are numerous of other

drivers that motivate companies to outsource logistics. Andersson (1998), Rajesha *et al.* (2013), Weiskott (1999), and Logozar (2008) argue that one reason to outsource logistics is to turn fixed costs into variable costs. The argument is that the company that outsource do not need to own, for example, warehouses or trucks for their logistics activities, but instead pay a volume dependent fee to the 3PL provider. Furthermore, access to modern expensive IT capabilities is a large driver for many companies (Mello *et al.*, 2008, Diabat *et al.*, 2103; Rajesha *et al.*, 2013; Logozar, 2008; Anderson *et al.*, 2011). Anderson *et al.* (2011) even states that access to IT capabilities might have become the largest driver for some companies today, as opposed to costs reduction that have been seen as the largest driver in the past. Power *et al.* (2007) have a similar view and state that cost alone is diminishing as the main driver of logistics outsourcing.

Apart from the aforementioned drivers to consider logistics outsourcing, there are some specific events that can trigger a company to start an outsourcing investigation. Mello *et al.* (2008) and Rajesha *et al.* (2013) mention that events, such as change of CEO, new management and new customer requirements, can make companies look at their distribution in a new way. Rajesha *et al.* (2013) further points out that mergers and acquisitions are contributing to the choice of outsourcing, since these strategic actions will contribute to new possibilities and difficulties in how to arrange the distribution network. Lastly, the choice of using a 3PL provider might be necessary when a company is expanding and does not have sufficient knowledge within the new market (Weiskott, 1999).

Even though logistics outsourcing has been on the rise the last couple of decades, there are still many companies that choose not to outsource. The most cited reason not to outsource logistics is loss of control over the logistics function (Mello *et al.*, 2008; Diabat *et al.*, 2013). Mello *et al.* (2008) also mention that companies could be reluctant to outsource logistics since the 3PL provider cannot meet their special requirements and that the people working with logistics in the company do not want to lose their jobs. Besides, it is argued that there could be an uncertainty in the actual cost of outsourcing (Mello *et al.*, 2008). At last, Diabat *et al.* (2013) conclude that companies could have a negative view towards 3PL providers since they think that it will be difficult to connect the shippers', the 3PL providers' and the customers' IT systems. A complete list of the different drivers for and against logistics outsourcing found in the literature can be seen in Table 2.2.

Table 2.2 Drivers for and against logistics outsourcing.

Drivers to outsource	Drivers not to outsource
• **Cost reductions** (Mello *et al.*, 2008; Andersson, 1998; Diabat *et al.*, 2103; Rajesha *et al.*, 2013; Deepen, 2007; Sahay & Mohan, 2006; Logozar, 2008; Selviaridis & Spring, 2010; Xiu & Chen, 2012; McGinnis *et al.*, 1995; Anderson *et al.*, 2011)	• **Loss of control** (Mello *et al.*, 2008; Diabat *et al.*, 2013). • **Special requirements cannot be met by the 3PL** (Mello *et al.*, 2008) • **Preserving jobs** (Mello *et al.*, 2008) • **IT connection problems** (Diabat

• **Service improvements** (Mello *et al.*, 2008; Andersson, 1998; Diabat *et al.*, 2103; Rajesha *et al.*, 2013; Deepen, 2007; Sahay & Mohan, 2006; Logozar, 2008; Selviaridis & Spring, 2010; Xiu & Chen, 2012; McGinnis *et al.*, 1995; Anderson *et al.*, 2011) • **Focus on core competencies** (Mello *et al.*, 2008; Andersson, 1998; Diabat *et al.*, 2103; Azzi *et al.*, 2010; Rajesha *et al.*, 2013; Solakivi *et al.*, 2011; Deepen, 2007; Weiskott, 1999; Logozar, 2008) • **Upgrade IT capabilities** (Mello *et al.*, 2008, Diabat *et al.*, 2103; Rajesha *et al.*, 2013; Logozar, 2008; Anderson *et al.*, 2011) • **React to changes in the regulatory environment** (Mello *et al.*, 2008, Rajesha *et al.,* 2013) • **Complexities in operating in just-in-time** (Mello *et al.*, 2008, Azzi *et al.*, 2010, Rajesha *et al.,* 2013) • **Rapid growth** (Mello *et al.*, 2008, Rajesha *et al.,* 2013) • **Limited resources to apply logistics activities in-house** (Mello *et al.*, 2008, Rajesha *et al.,* 2013) • **Transfer fixed assets into variable costs** (Andersson, 1998; Rajesha *et al.,* 2013; Weiskott , 1999; Logozar ,2008) • **Reduce the risk of owning capacity in assets** (Andersson, 1998) • **Reconstructuring of supply chain** (Andersson, 1998) • **Reducing inventory** (Diabat *et*	*et al.,* 2013) • **Filling idle capacity on equipment** (Mello *et al.*, 2008) • **More authority** (Mello *et al.*, 2008) • **Corporate advertising on trucks** (Mello *et al.*, 2008) • **Uncertainty in service levels and the actual cost of outsourcing** (Mello *et al.*, 2008) • **Lack of qualification of the employees at the 3PL** (Diabat *et al.*, 2013) • **Fear of retrenchment by employees of the firms** (Diabat *et al.*, 2013)

al., 2013) • **Penetrating markets** (Diabat *et al.*, 2013) • **A need for expertise** (Rajesha *et al.*, 2013) • **Enhance flexibility** (Azzi *et al.*, 2010, Sahay & Mohan, 2006 • **Negotiating guaranteed service levels** (Onge, 2002) • **New management** (Mello *et al.*, 2008; Rajesha *et al.*, 2013) • **New customer requirements** (Mello *et al.*, 2008; Rajesha *et al.*, 2013) • **Mergers and acquisitions** (Rajesha *et al.*, 2013)	

2.2.4 Effects of logistics outsourcing

The most commonly cited advantages of logistics outsourcing are cost reductions (Andersson, 1998; Diabat *et al.*, 2013; Rajesha *et al.* 2013; Deepen, 2007; Marasco, 2008). There are two main reasons for why a 3PL provider can achieve lower cost for handling logistics than the shipper. First of all, 3PL providers can achieve greater economies of scale and scope due to that they combine the volumes from all their customers they provide similar services for (Andersson, 1998; Azzi *et al.*, 2010; Deepen, 2007). This also means that they can even out demand variations between the different customers to be able to achieve high resource utilization (Barve *et al*, 2008). According to the author, this makes a 3PL provider especially efficient for companies that have high demand fluctuations and high uncertainty with regard to the geographical spread of the demand, since the 3PL provider's ability to even out these fluctuations and uncertainties then becomes a great advantage. Secondly, the 3PL provider can be more cost efficient due to that they have more knowledge in the area of logistics since logistics is their core business (Andersson, 1998; Azzi *et al.*, 2010). Deepen (2007) argues that a 3PL provider is also subject to competitive pressure, which is not present in an in-house solution. This is due to that since the shipper will change 3PL provider once the contract expire if they are not happy with the way the provider perform, the 3PL provider have an incentive to always strive to achieve the best possible performance. The reduction in cost have been measured by Langley *et al.* (2014), who state that cost reductions are about 11% for logistics costs and 6% for inventory costs.

Another advantage of logistics outsourcing is that it can improve logistics service performance (Andersson, 1998; Deepen, 2007; Marasco, 2008). As stated above, a 3PL provider can be more cost efficient since logistics is their core business, and thereby have access to more knowledge about logistics. The same is true for service performance, which is positively affected by the 3PL

provider's knowledge base (Andersson, 1998; Deepen, 2007). Burnson (2012) further argues that a 3PL provider can react quickly to changes and generate ideas for improvements since they have great knowledge about the business. Moreover, a 3PL provider also have access to more advanced technology and can, due to economies of scale, make more investments in IT and infrastructure, which result in the ability to enhance service performance (Deepen, 2007). Deepen (2007) states that outsourcing turn fixed costs into variable costs since the 3PL provider gets paid depending on the volume, whereas an in-house solution have certain fixed costs for facilities and employees. Furthermore, the author argues that outsourcing reduces both the strategic and operative risks of the company. Strategic risks is reduced since decision about investments in logistics related assets do not have to be made, and operational risk is reduced since logistics performance can be negotiated into a contract.

Loss of control of the logistics function is stated above as a driver not to outsource logistics. However, outsourcing increases the control of the cost of logistics, according to Andersson (1998), since it becomes a direct cost in the form of an invoice instead of indirect costs. Azzi *et al.* (2010) and Deepen (2007) also argues that logistics outsourcing reduces complexity in the organization, since all distribution activities is reduced to one, or a couple of, 3PL relationships. There are also some disadvantages related to logistics outsourcing. The main disadvantage is that costs arise due to the outsourcing relationship. Azzi *et al.* (2010) state that there are costs in negotiating and creating the contract, as well as costs of managing the ongoing relationship. This is also the opinion of Logozar (2008), who states that there might be a need for special staff to monitor the relationship. Moreover, Andersson (1998) also states that these transaction costs increases when outsourcing. Other disadvantages is given by Deepen (2007), who argues that even though outsourcing can reduce complexity of a company in one way, it could also increase complexity by adding the 3PL relationship. The author also states that it is a disadvantage that the shipper depends on the 3PL provider to perform according to the contract. Another disadvantage is, according to the author, that the data required to evaluate the 3PL provider is actually provided by the 3PL provider themselves.

The most commonly stated risk of logistics outsourcing is to lose the logistics knowledge that exists within a company (Azzi *et al.*, 2010; Srabotizc & Ruzzier, 2012; Deepen, 2007; Onge, 2002). Since knowledge has been accumulated in a company that have performed logistics activities in-house for a long time, the loss of that knowledge could be a big waste. Moreover, Onge (2002) argues that if the company loses its logistics expertise, it will also be harder for them to keep up with available improvement technologies on the market that the 3PL provider might not be inclined to invest in. Deepen (2007) also state that a loss of logistics knowledge makes it harder to evaluate the 3PL provider, which the 3PL provider might take advantages of. Moreover, the author claims that there are additional costs that need to be taken into account if the company wants to keep the knowledge in-house. Other risks are given by Srabotizc & Ruzzier (2012) and Weiskott (1999), who states that logistics outsourcing can lead to reduced contact with the final customer and loss of control over the logistics function. Moreover, Srabotizc & Ruzzier (2012) and Daim *et al.* (2011) argue that innovative improvements in logistics could disappear if the function is

outsourced. A complete list of the different advantages and disadvantages of logistics outsourcing found in the literature can be seen in Table 2.3.

Table 2.3 Effects of logistics outsourcing.

Advantages of logistics outsourcing	Disadvantages of logistics outsourcing
• **Reduced logistics costs** (Andersson, 1998; Diabat *et al.*, 2013; Rajesha *et al.* 2013; Deepen, 2007; Marasco, 2008) • **Increased logistics service performance** (Andersson, 1998; Deepen, 2007; Marasco, 2008) • **Increased flexibility** (Power *et al.,* 2007) • **Better cost control** (Andersson 1998) • **Control of service performance** (Andersson, 1998) • **Turn fixed costs into variable costs** (Deepen, 2007) • **Access to know-how and fresh ideas** (Burnson, 2012) • **Reduced complexity** (Deepen, 2012) • **Reduced need for investments** (Deepen, 2012) • **Access to advanced technology and infrastructure** (Deepen, 2007) • **Reduced strategic and operative risks** (Deepen, 2007) • **A 3PL can react quickly to changes and generate ideas for improvements** (Burnson, 2012)	• **More transaction costs** (Azzi *et al.,* 2010; Logozar, 2008; Andersson, 1998) • **Employee resistance** (Azzi *et al.,* 2010) • **Adds relationship complexity** (Deepen, 2007) • **Dependence on 3PL provider** (Deepen, 2007) • **Problems with evaluating 3PL provider** (Deepen, 2007) • **Need for special staff to monitor the relationship** (Logozar, 2008) • **Loss of internal skills and knowledge in logistics** (Azzi *et al.*, 2010; Srabotizc & Ruzzier, 2012; Deepen, 2007; Onge, 2002) • **Reduced contact with the final customer** (Srabotizc & Ruzzier, 2012; Weiskott, 1999) • **Loss of logistics innovative capacity** (Srabotizc & Ruzzier, 2012; Daim *et al.* 2011) • **Hidden costs** (Srabotizc & Ruzzier, 2012) • **Dependence on the third party logistics provider** (Srabotizc & Ruzzier, 2012) • **Conflicts of culture** (Srabotizc & Ruzzier, 2012) • **Loss of control of the logistics function** (Weiskott, 1999) • **Service level commitments not realized** (Daim e*t al.,* 2011)

2.3 Outsourcing process

This section covers the outsourcing process in three steps, adapted from van Weele (2010); the make or buy decision, the supplier selection process, and the management of the ongoing relationship with the 3PL provider.

2.3.1 Make or buy decision

Several authors are mentioning the importance of top management commitment when deciding if to outsource distribution (Mello *et al.*, 2008; Sahay & Mohan, 2006; Logozar, 2008). Logozar (2008) and Azzi *et al.* (2010) mention that outsourcing is a strategic decision that affects the whole company, which the top management therefore should be a part of. Of the same reason, Sahay & Mohan (2006) state that it is important that the decision receive support from all the departments within the company and that the outsourcing selection group is cross-functional with representatives from different departments, such as purchasing, logistics and sales. However, Mello *et al.* (2008) has shown that these types of decisions are commonly not taken on a strategic level, but more on a tactical level. The author further describes that personal factors, such as experience and self-interest, and cultural factors, such as organizational values and norms, are usually present in the outsourcing process instead of only systematical methods. This theory thereby extends the traditional view of outsourcing strategies , such as the views by Sink & Langley (1997) and Bagchi & Verum (1998), which does not consider the personal and cultural factors in the outsourcing decision and when selecting the right supplier.

When deciding to use a 3PL provider it is important to know what you want to achieve and what you already have (Weiskott, 1999). The goals and objectives of the outsourcing decision need to be clear and the company also has to know their current costs and service levels for future evaluation. Moreover, Solakivi *et al.* (2008) mention that all companies need to consider their own specific context to know if outsourcing is appropriate in their environment. Marasco (2008) state that there are three characteristics that is important to consider when deciding to outsource logistics. These are network complexity, which comprises both the geographical complexity and the intensiveness of contact with the company's trading partners, process complexity, referring to time and task compression, and product complexity, including how the products characteristics affect the distribution. By further doing a careful risk analysis potential risks and opportunities might be foreseen (Srabotic & Ruzzier, 2012). Azzi *et al.* (2010) have identified four main topics for evaluating the trade-offs between logistics outsourcing and logistics self-management. According to the author, these four topics are; pros and cons related to cost, competences, personnel reactions and behavior, as well as benefits and risks concerning relationship management.

Transaction cost economics (TCE) is mentioned as the core of almost all make-or-buy decisions (Rajesh *et al.*, 2013). Several authors have pointed out the importance of conducting TCE calculation to understand the consequences of outsourcing (Andersson, 1998; Azzi *et al.*, 2010; Logozar, 2008; Deepen, 2007). Andersson (1998), for example, mentions that it is important to not only consider the direct cost of distribution and the service level, but to consider the indirect effects from transactions. Deepen (2007) describes transaction cost as the cost for each transaction, for example negotiations and contracting. The author divides the cost into four;

search costs, contracting costs, monitoring costs and enforcement costs. Search costs include the costs of gathering information to identify and evaluate potential trading partners and thus consisting of travel and communication expenses. Contracting costs refers to the costs associated with negotiating and writing an agreement. Monitoring costs are those costs associated with monitoring the agreement to ensure that each party fulfills the obligations in the contract. Enforcement costs are costs that are incurred when a party must renegotiate with trading partners that does not perform according to the agreement.

Van Weele (2010) suggests a three-stage model for the outsourcing process; the strategic, the transition and the operational stage. In the strategic phase, the company should decide why it wants to outsource, what activities to outsource and which qualifications a potential suppliers should have. In the transition phase the suppliers are picked, contracts are negotiated and the outsourcing project is executed. The last stage, operational, includes the management of the buyer-supplier relationship and is, according to the author, the most critical part for success. The first stage can start by using the outsourcing matrix (van Weele, 2010), which can be seen in Figure 2.3. The matrix gives a company an indication of what type of outsourcing strategy to use depending on the company's level of competitiveness relative suppliers and the strategic importance of competence. If the activity that is under consideration for outsourcing is important strategically and the company have a high competiveness relative suppliers, the company should keep the activity in-house and invest further to enhance competitiveness. If the opposite is true, the company should outsource. If the strategic importance is low but the company still has a competitive advantage, the activity should stay in-house as long as the company's competitive advantage remains. On the other hand, if the strategic importance is high but the company does not have any competitive advantages relative suppliers, the activity should be outsourced in the form of, for example, a partnership, an alliance or a joint venture.

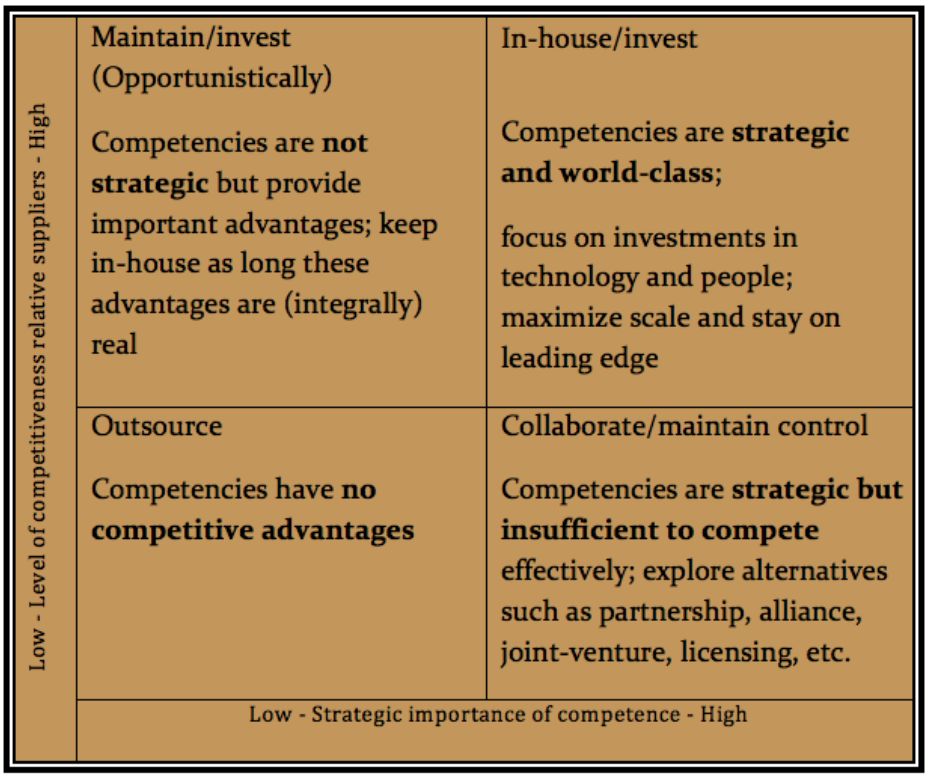


Figure 2.3 The outsourcing matrix. Source: van Weele (2010).

2.3.2 Outsourcing selection strategies

When a company has taken the decision to outsource logistics services to a 3PL provider, the next phase is to find the right supplier(s) to work with. This is a vital phase, since failed partnerships is commonly a result of lack of proper selection of 3PL providers (Sahay & Mohan, 2006). TCE is mentioned by Rajesh *et al.* (2013) to be a useful tool in this stage as well, but need to be supplemented by a thorough investigation of the capabilities and embedded knowledge of the different suppliers. If only one 3PL provider are chosen the transaction cost decreases. However, the bargaining power, which could have been used by contracting several suppliers, decrease as well. Moreover, according to Anderson *et al.* (2011), TCE is also used to choose the provider with least planning, adaption and monitoring cost. The evaluation of suppliers can be supplemented by using another commonly used theory called the resource-based view (RBV) (Azzi *et al.*, 2010). RBV, unlike TCE, focus on capabilities and knowledge that the supplier can contribute with (Anderson *et al.*, 2011). According to de Grahl (2011), RBV explains how companies can achieve competitive advantage by using resources that they have access to in the best possible way. These resources could be physical, human and organizational and the company can own these by themselves or have access to them through relationships with other actors. However, the author points out that access to resources is not self-evident for increased performance, but the company needs capabilities to get use of these resources in a good way. Therefore, a company needs to take the resources of the potential supplier into account and also find a supplier that will invest in a good relationship with them, and thereby allowing them to take advantage of these resources.

Daim *et al.* (2011) and Xiu & Chen (2012) mention that when deciding which partner to work with it is important to first develop selection criteria, such as cost, quality and delivery performance. McGinnis *et al.* (1995) gives a different view and argue that companies should choose a supplier that is financially stable and has the appropriate industry knowledge. Moreover, the choice of 3PL provider must be adapted to the company context and hence, a case-by-case approach will have to be taken when selecting the right supplier. Weiskott (1999) has summarized all these thoughts into six key characteristics that need to be considered when choosing 3PL providers. These are; "*the knowledge and expertise of the supplier*", where the amount of services are included, "*the financial stability of the supplier*", "*the current performance of the supplier*", where it is investigated if the supplier meets the current requirements, "*the suppliers culture*", which takes into account if the supplier's philosophy matches the company's, "*the suppliers flexibility*", where the suppliers ability to adapt to changes in demand are included, and the "*compatibility of the supplier*", which takes into consideration if the suppliers strategic goals and corporate values matches the company's.

The next step after the selection criteria have been developed is to make a first screening over potential suppliers, where a couple of candidates should be selected (Daim *et al.*, 2011). These candidates will then receive a request for information (RFI), or also called a request for quotation (RFQ) (Rajesh *et al.*, 2013). The RFI should be as detailed as possible and should include a description of the activities that should be outsourced. The author mention that a RFI to a 3PL provider should at least include the scope of the contract, including facilities, departments, locations, shipment volumes, number of deliveries, number of items, the activities to be performed, such as warehousing and transportation, and the required performance level. All candidates should take part of the same information in order to make a fair assessment. The answers from the different candidates might not be comparable at first, which also makes it important to normalize those (Daim *et al.*, 2011). That means that all answers, in numbers or statements, should be in the same format to be able to compare them against each other. The bids should then be evaluated by a cross-functional group within the company to obtain a holistic view of the performance of the suppliers. According to Xiu & Chen (2012), the selection of the candidates can be done both qualitative, e.g. through previous experience and benchmarking, or quantitatively, by using mathematical models and statistics. A way of quantitatively select the right supplier is to use a method called the Analytical Hierarchy Process (AHP), where the suppliers are ranked after how well they meet specific quantifiable criteria (Daim *et al.*, 2011). These criteria should be the same as the criteria developed in the first stage in the selection phase. Each criterion receives a corresponding weight. After that, the answers from the RFQs are normalized and each criterion receives a value depending on the answers. These values are multiplied by the corresponding weight and the total score is calculated. If the weighting of the criteria is done correctly, the supplier with the highest total score will be the best fit for the outsourcing company (Xiu & Chen, 2012).

2.3.3 Managing 3PL relationships

When outsourcing services in general, there are certain issues that need to be taken into account (Selviaridis & Spring, 2010). One of these is, according to the authors, the development of specifications and contracts. The buying company should try to have as clear specifications as possible and create detailed contracts to control service performance and avoid supplier opportunism. However, the authors argue that in logistics outsourcing it is much harder to specify service requirements in detail, and that this result in a need for flexibility to be built into the contract. Hence, a detailed contract cannot be made, which result in more demands on the business relationship. This is also the opinion of Gadde & Hulthén (2009) and de Grahl (2011), who argue that even though detailed contracts could be used for the shipper to gain control, they will constrain the 3PL provider and lead to disappointments.

Regarding relationship management, the design of the outsourcing relationship has a big impact on the outsourcing performance (Gadde & Hulthén, 2009; Deepen, 2007). Moreover, Lieb & Bentz (2005) argue that since 3PL relationships can be very complex, they are also difficult to manage for both the shipper and the 3PL provider. Deepen (2007) points out that even though partnerships can result in competitive advantages for both the shipper and the 3PL provider, many partnerships fail due to the design of the partnership. Therefore the design of the relationship is very important to be successful. Moreover, Andersson (1998) argues that since more and more companies are using 3PL providers, the competitive advantages from outsourcing will in the future come from knowing how to manage the 3PL relationship, instead of the actual outsourcing.

As it seems, the shipper-3PL provider relationship is a very important aspect in logistics outsourcing. However, Gadde & Hulthén (2009) state that many relationships fail due to poor understanding of all aspects of the relationship. Moreover, the authors argues that companies often underestimate the effort that have to be put into a relationship to make it successful, and that the relationships need time to mature. Hence, companies should give the relationships time to evolve and try to make them better, instead of terminating them too quickly if the result is not as expected. Partnerships also fail due to inefficient coordination during the integration process and most importantly improper management of the established relationship (Sahay & Mohan, 2006). Other reasons for failure in shipper-3PL provider relationships are given by Deepen (2007) and include, for example, over-promising of the seller or the inability to deliver, deliberate attempts of the customer's management to make the partnership fail or become unprofitable for the supplier, poor communication, lack of top management support for the partnership, poor planning, lack of shared goals and a missing strategic direction of the partnership. Furthermore, many companies do not see the 3PL provider as a partner and therefore do not communicate properly and share enough information (Sahay & Mohan, 2006). Instead, they see the relationship as just a contractual agreement. In those cases, the benefits of strategic collaboration disappear, according to the author.

According to Lambert *et al.* (1996), partnership is *"a tailored business relationship based upon mutual trust, openness, shared risk, and shared rewards that yield a competitive advantage, resulting in business performance greater than would be achieved by the firms individually"*. It seems to be the common view that a partnership is the most successful way to outsource large parts of logistic (Andersson, 1998). For example, Azzi *et al.* (2010) argue that benefits cannot be gained unless the relationship is long-term and the parties are interdependent. Moreover, Marasco (2008) points out that trust and commitment are important to manage 3PL relationships and Rajesh *et al.* (2013) state that working closely with the 3PL provider increase the efficiency of the relationship. Two reasons why partnerships enhances the outsourcing performance is given by Andersson (1998), who argues that a close relationship involving trust reduces transaction costs since the shipper do not have to monitor and control the 3PL provider to a large extent. Moreover, the author points out that if the relationship is on a long-term basis, the 3PL provider has incentives to make investments for the specific customer that increase both effectiveness and efficiency. The argument that trust lowers transaction costs is also the opinion of Deepen (2007), who state that trust lowers the risk of opportunistic behavior, which in turn reduces the need to monitor and control the 3PL provider.

Knowledge and information sharing are two commonly cited aspects of a partnership that enhances the outsourcing performance. According to Gadde & Hulthén (2009), the 3PL provider need knowledge about the shipper's products and operations, as well as regular information and data about, for example, demand and promotions. Furthermore, the authors argue that the shipper needs information about the provider's way of working and what resources the provider has. This is due to that the shipper should be able to evaluate the scope of outsourced activities, and also retain knowledge about the logistics flow. These aspects are important since both the shippers' requirements and the providers' resources change over time, and therefore the relationship and scope of outsourced activities should change as well. Sahay & Mohan (2006) discuss other important aspects of a collaborative partnership. These are mainly an open honest environment, mutual respect, and a commitment to financial and commercial arrangements. In Figure 2.4, a model of important aspects of a partnership developed by Deepen (2007) can be seen. The author argues that cooperation, proactive improvements, and functional conflicts have a direct effect on both the expected performance of the relationship, but also the exceedance of the expected performance. The other aspects in the model have an indirect effect on performance.

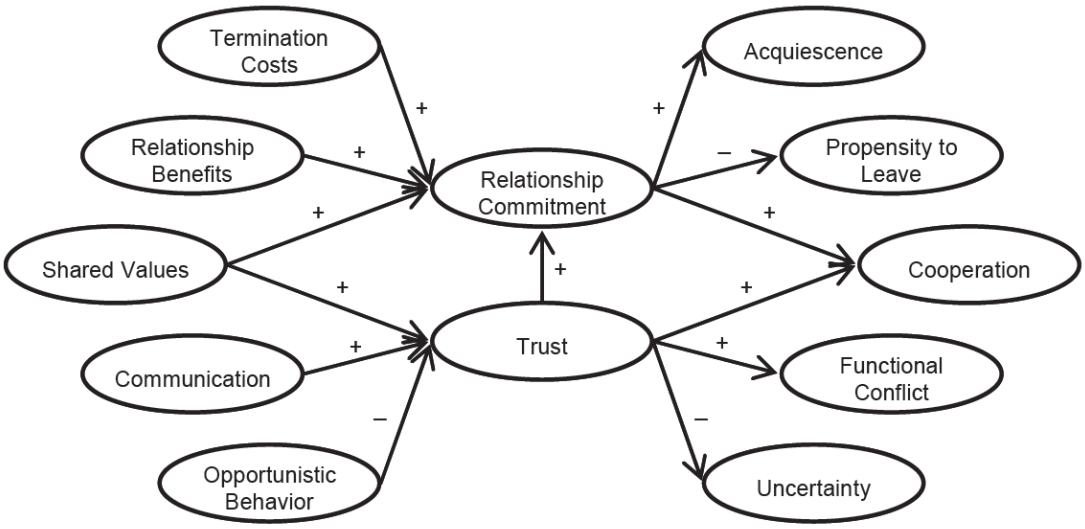


Figure 2.4 Model of aspect that affect outsourcing relationships. Source: Deepen (2007).

Srabotic & Ruzzier (2012) and Deepen (2007) present a model based on three elements to develop an effective partnership. These are drivers, facilitators and management components. Drivers are reasons why the two parties should enter partnerships and can be, for example, cost and service improvements or market advantages. There have to be one or more drivers for the partnership to be successful. Facilitators create an environment for the relationship to grow and be successful. These facilitators could be corporate compatibility, similar managerial philosophy and/or shared competitors. Drivers and facilitators are prerequisites for a partnership to be successful, but management components are what actually make the relationship a success. Management components include, for example, planning, joint operating controls, communications, risk and reward sharing, trust and commitment, contract style, and financial investments. The partnership develops by jointly planning the degree of the different management components, to tailor the relationship to the specific context.

2.4 Analytical framework

The analytical framework will be used as a tool in the analysis to be able to gain knowledge needed to discuss the research questions. The framework has been based on theories about the outsourcing process, described in the theoretical framework, which describes stages and important aspects to consider in the outsourcing process. The analytical framework consists of five phases. Phase one to three will be used for research question one, i.e. to gain knowledge about important aspects that affect the outsourcing decision. Phase four and five will be used for research question two, i.e. to gain knowledge about aspects that affect the success of logistics outsourcing. The complete analytical framework will be discussed below and can be seen in Figure 2.4.

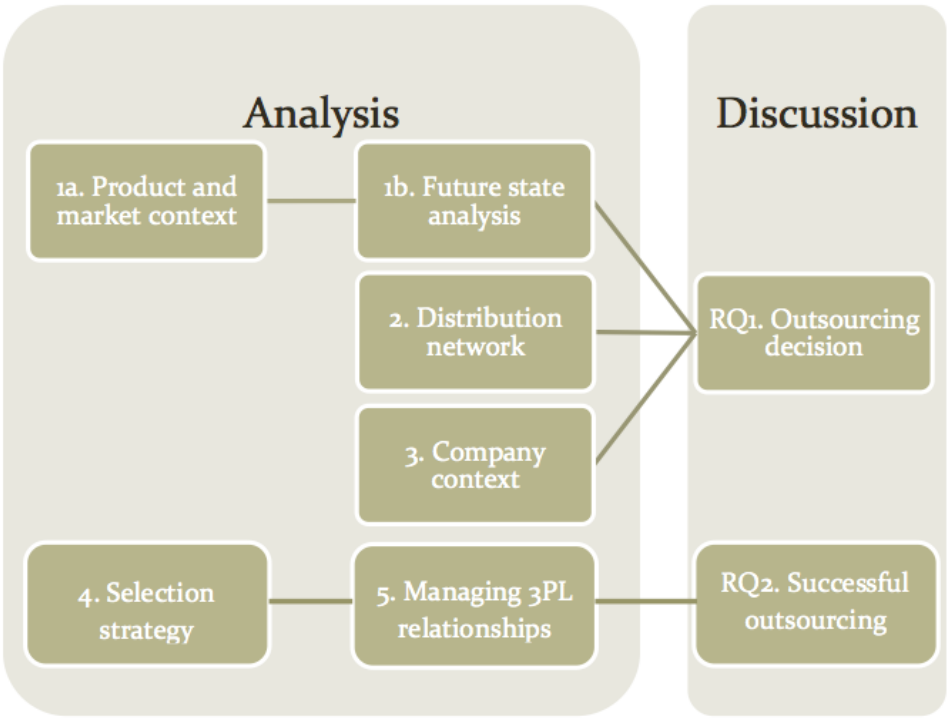


Figure 2.5 Analytical framework.

In order to discuss research question one, knowledge will be needed about how a future 3PL distribution network could look like for the case company, how a company's distribution network affect the decision to outsource logistics, and how a company's context affect the decision to outsource logistics. In the first phase, a future state model of the case company's distribution network will be developed. The future state model will be developed in cooperation with a 3PL provider to see how the distribution network could look like if outsourced to a 3PL provider. To be able to do this, knowledge is also needed about how the case company's product are characterized according to Fisher (1997) and how customer requirements, such as service level, lead time and specific requirements imposed on the healthcare industry, affect the distribution network. In phase two, a company's distribution network will be analyzed with regard to how it

affects the decision to outsource logistics. In phase three a company's context, e.g. a company's view of the logistics function, a company's logistics knowledge and the growth pattern of a company will be analyzed according to how it affects the outsourcing decision.

According to, for example, van Weele (2010), once the decision to outsource is done two important steps remains. These are to (4) select the right 3PL provider and (5) to manage the ongoing relationship. Therefore, the fourth and fifth phase will analyze aspects that will make logistics outsourcing as successful as possible once the decision to outsource has been made, which corresponds to research question two. In the fourth phase the 3PL provider selection strategy will be analyzed, i.e. if the company chooses to outsource distribution, what are the important aspects to consider and what criteria should be used to evaluate the possible 3PL providers to make the outsourcing decision as successful as possible? In the fifth and last phase a company's view of logistics as a business function and the output from the 3PL provider selection process will be analyzed with regard to how the 3PL relationship should be managed to make the outcome of logistics outsourcing as successful as possible.

3. Methodology

This chapter will describe how the thesis was conducted. The research strategy will be discussed and the work will be divided into phases, which facilitated the execution of the thesis. The method how the future state model was developed will also be described. Moreover, the methods that have been used to collect and analyze data will be described, and the validity of this thesis will be discussed.

3.1 Research strategy

In order to conduct the work in the thesis in a good way, it may be helpful to decide what type of research method that should be used when collecting and analyzing data. Research methods are commonly divided into quantitative and qualitative research approaches. Qualitative research is, for instance, case studies, theory studies or interview studies (Jha, 2008). In a case study a specific case, e.g. an individual, a group or a company, is observed to answer predetermined research questions (Gillham, 2010). Gillham (2010) further mention that the case is a human activity embedded in the real world, which can only be understood in context. Quantitative research on the other hand is often based on statistical studies and experiments. In qualitative research there is more room for interpretation of the data than in quantitative ones, i.e. the same data can give different conclusions depending on how the data is interpreted (Jha, 2008).

The research method that this thesis will follow is qualitative, due to that it is a case study mainly based on interviews. Moreover, a large part of the work in this thesis has been to interpret the answers from interviewees and connect them to their specific contexts. The reason to use a qualitative approach was because this thesis is supposed to derive reasons based on argument, regarding the decision to outsource logistics. Further, the literature study, the interviewees and the analysis have been conducted in parallel. That means that the researchers had to find out what questions to be asked at the interviews and the topics to be read in the literature continuously throughout the work of this thesis.

3.2 Work process

This thesis has mainly consisted of six phases to reach its purpose (Figure 3.1). These phases have been conducted in the order shown in Figure 3.1, but have been overlapped to a high extent. In the first phase a situational analysis of the case company was performed to analyze the company's current situation. This was done by performing interviews with personnel working at the case company, studying documents regarding the current distribution arrangement and by conducting study visits at the company's production site and their adjacent distribution center. In the second phase a theoretical study was conducted to obtain general knowledge needed to reach the purpose. The literature that was used in this phase have been read and summarized to give a picture of the general academic knowledge in the area of logistics outsourcing and distribution. The third phase consisted of performing interviews with a 3PL provider, as well as with representatives from companies that had previous experience of outsourcing logistics services. The information that was obtained from these interviews was then analyzed in the fourth phase,

the analysis, and in the fifth phase a future state model for the case company was developed with help of arguments from the analysis. The future state model was based on how the case company's European distribution network would have looked like if outsourced to a 3PL provider. The sixth and last phase of the thesis consisted of a discussion where the research questions were discussed to reach an answer to the purpose of this thesis. The work breakdown structure of the thesis can be seen in Figure 3.1.

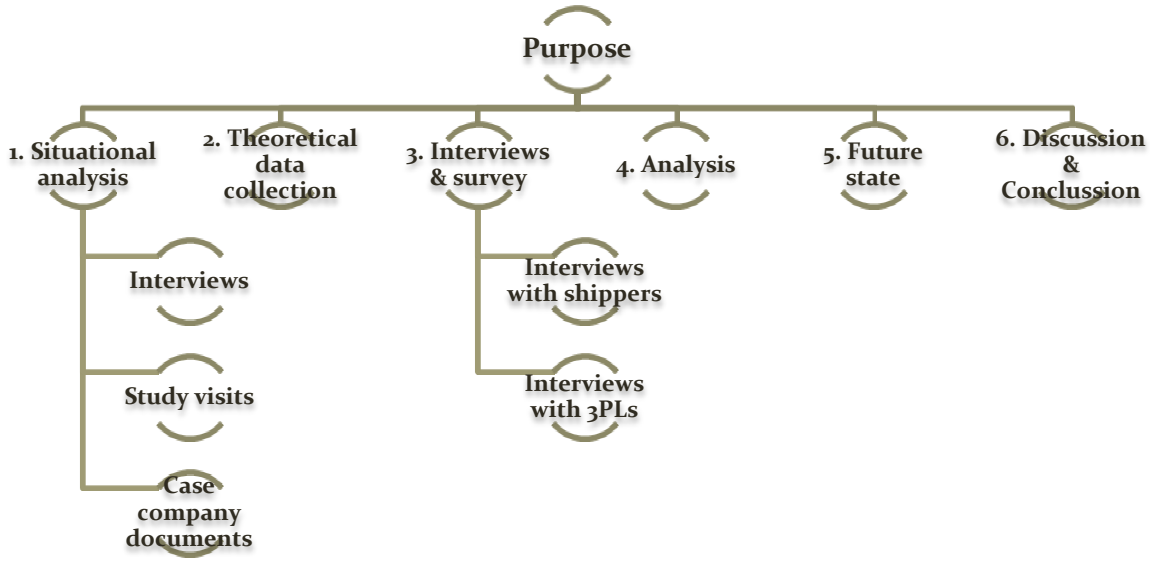


Figure 3.1 Work breakdown structure.

3.3 Interviews and data collection

In order to get a broader perspective of how the case company could structure their outbound distribution and to get hold of experiences from 3PL distribution, interviews were carried out and questionnaires were sent out to selected companies. First of all, interviews were conducted to collect information about how a 3PL provider alternative might perform compared to an in-house solution. Secondly, interviews with a 3PL provider were held to get an understanding of their view of a successful 3PL implementation. For companies that did not have time for interviews, but still wanted to be part of the study, did receive a questionnaire with question, see Appendix A, similar to the ones that were asked during the interviews. Apart from that, unofficial interviews and meetings were conducted with employees at the studied case company to obtain necessary information to perform the study.

The interviewed companies were selected with respect to the industry they operated in and the requirements that were put on their distribution. Therefore, most of the companies that were interviewed operate in the healthcare industry. The apparel and accessories company were selected due to that it were hard to find companies that had outsourced their entire distribution to 3PL providers. Moreover, the requirements that were put on this company's warehouse operations were similar to the ones performed within the case company. The 3PL company was

chosen according to their size and thereby their possibility to reach customers in all European countries. Most companies were contacted by e-mail and some by telephone. Generally, the researchers did not choose the interviewees within the companies, but the respective companies selected these as suitable. However, in the case of the interviewee from the 3PL company, this person was chosen as the researchers have had previous contact with him/her. Other companies, with similar characteristics as those mentioned above, were contacted with request for an interview, but these companies did not return with an answer. Therefore, all companies that returned with an answer, had previous experience from logistics outsourcing and had similar requirements for their distribution as the case company, were elected as participants in this empirical study. The companies that have been interviewed or have answered a questionnaire are summarized in Table 3.1.

Table 3.1 Interviewees and people responded to questionnaires.

Interviewee	Type of company	Position	Interview/ Questionnaire
A	Healthcare company (I)	EMEA logistics director	Interview
B	Apparel and accessories company	Warehouse and transportation manager	Interview
C	3PL company	Manager solution design	Interview
D	Healthcare company (II)	Supply chain director	Questionnaire
E	Healthcare company (III)	Transport manager	Questionnaire
F	Healthcare company (IIII)	Supply chain director	Interview
G	Case Company	Head of purchasing and supply	Interview
H	Case Company	Logistics developer	Interview

Collection of data is a critical part of the thesis for the credibility of the report. The data has here been divided into primary data and secondary data. Primary data is information that researchers gather first hand (Rabisnaki, 2003). In this thesis the primary data have been collected by means of interviews, questionnaires and observations, although interviews have been the main source. Two interviewers conducted the interviews, and they took about an hour to perform. The interviews was conducted as discussions were general questions was thought of beforehand to steer the discussion in the right direction. The interviews have not been recorded, but the interviewers took notes. There are divided opinions on whether tape recorders should be used in interviews (Bryman and Bell, 2007). When exactness of what people have said is important, then taping will be a benefit. However, if interviews are more focused in objective data, as in the case in this study, then the benefits of taping are reduce (ibid). Moreover, transcribing tapes is time consuming and it can be seen as a substitute for listening and may inhibit interviewees. The notes were summarized after the interview and sent to the interviewee for confirmation. Moreover, unofficial interviews have been conducted. In these cases, questions have been asked to employees of the case company whenever a question arise that needed a quick answer. According

to Rabisnaki (2003), secondary data is information from secondary sources. In this thesis, the main secondary data have been collected through articles and books with the aim at generating the theoretical framework. These articles and books have been downloaded from Chalmers library, and the search phrases that have been used to find them was, for example, "logistics outsourcing", "3PL", "third-party logistics" and "planning environment". Apart from that, some of the case company's internal documents have been studied, as well as websites, to broaden the empirical study.

In the future state analysis the 3PL provider received order statistics from the case company, containing data for each order sent to European customers including date, country, postal code, weight of the shipment and volume of the shipment. The 3PL provider then gave a suggestion of the number and location of warehouses by using a lead-time requirement. The number and location of warehouses was then changed through a discussion with the 3PL provider to find the best solution if some of the most remote customers would receive a longer lead-time. When the number and location of warehouses was set, the 3PL provider was given information about the flow of goods through each warehouse. This data was retrieved from the case company's IT system and compiled in a questionnaire that can be found in Appendix B. With that information the 3PL provider was able to estimate the cost for each warehouse.

3.4 Data analysis

In order to analyze the data the analytical framework, introduced in section 2.4, has been used. In the analysis primary data has mainly been used. In chapter 6.1 the primary data was from the interviews with personnel at the case company used together with secondary data concerning distribution network design, which was presented in chapter 2.1. In chapter 6.2-6.5, primary data from the interviews and questionnaires conducted with external companies was mainly used exclusively. Some of the primary data that was used in the future state analysis needed to be supplemented by calculations to match the data that was requested by the 3PL provider.

3.5 Validity and reliability

The main issue with validity of this thesis was the interviews. It is vital that the interviewees' answers, which have been the main input to the analysis, are interpreted correctly. The fact that there were always two interviewers performing the interviews made it easier to discuss the answers afterwards to assure correct interpretation. Moreover, the interviewers took notes during the interview, which was later sent to the interviewees for approval. However, there was still an issue with the interpretation of the answers afterwards regarding how much emphasis the interviewees put on each answers. Other issues with the interviews were that only one person at each company was interviewed. This was a problem since different employees at a company might have different views of the asked questions. Moreover, the interviews were performed more as discussions than just questions and answers. This was considered to be positive since the interviewees were given room to discuss everything they wanted, but there was also a problem that the interviewees did not receive the exact same questions. The researchers would have wanted to have more interviewees to obtain more empirical information, to be able to increase the validity of this thesis. Further, some of the interviewees was not interviewed in person, but

answered a questionnaire. The answers from these questionnaires gave much less knowledge than the interviews performed in person. This is the reason why some of the boxes in Table 5.2, which summarizes the result from the interviews and surveys, are left empty. Moreover, since the companies were selected with the respect of the industry they operate in and not with the aim of receiving equal amount of answers for all questions, some questions received a larger base of information than others. Another issue in this thesis was that only one case company was studied and analyzed. If more companies would have been studied the validity of the conclusion would have increased. However, a large part of the analysis did not include the case company, but rather information from interviews with representatives from external companies, which decreases the issue of having only one case company.

4 Case description

This chapter will describe the case company's current situation, the scope of the case, as well as the company's view of their logistics function and of the concept of third-party logistics.

4.1 Current situation

This section will describe the current distribution network and important requirements and characteristics of the case company, which will affect the decision to outsource logistics.

4.1.1 Current distribution network

The case company is a quite large Swedish healthcare company, which has more than 500 employees and produces healthcare products for customers globally. The company's largest market is Europe and they are at the moment considering redesigning their outbound distribution network for this part of the world to be able to decrease total distribution cost and tied up capital. The current design is a combination between an in-house solution and an outsourced solution, where the mayor part of the warehouses in Europe are owned or rented by the company, but also where different 3PL providers operate different warehouses. This is, according to interviewee G, quite messy and has an unsatisfactory level of transparency. Moreover, the warehouses that is owned or rented by the company have sales and marketing offices located in them. The company also owns a warehouse close to their manufacturing plant, where all products are stored before being sent to customers or intermediate warehouses. All transportation from the finished goods storage to customer is currently outsourced to different logistics service providers depending on the destination of the products. The future alternatives for the design of the distribution network is to centralize the storing of products to one, or a few, warehouses in Europe or to outsource the complete outbound distribution to 3PL providers. The future distribution structure will in the latter case be based on the 3PL provider's preferences, with the requirement that customer orders to Sweden, Denmark, Norway, Finland, United Kingdom, Austria, Nederland, Belgium, Luxemburg, Germany, France, Spain, Italy and Switzerland should be able to be delivered within 24 hours, see Figure 4.1. However, customers that are located in remote locations do not have to be supplied within 24 hours, according to interviewee H.

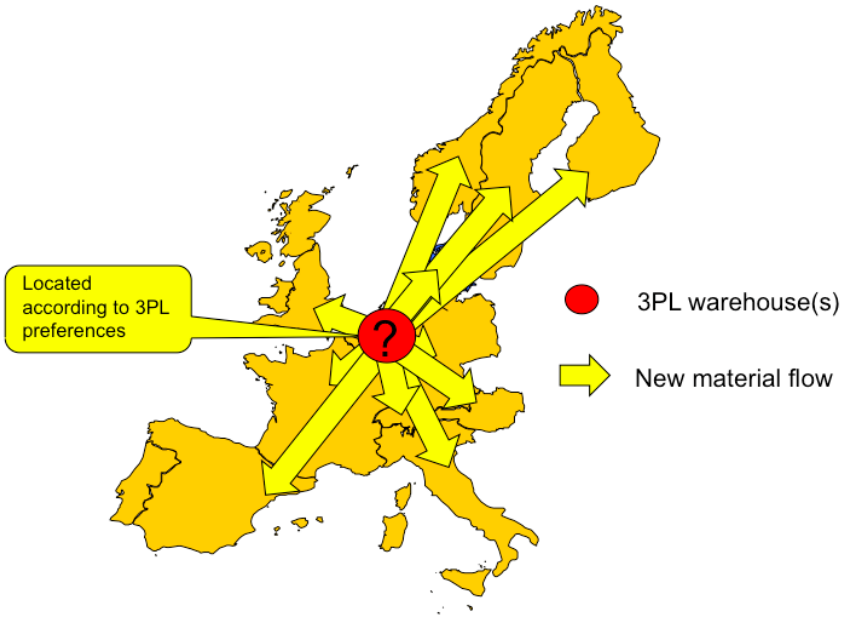


Figure 4.1 3PL provider distribution network solution.

4.1.2 Important requirements and characteristics

For the company to consider outsourcing distribution, and thereafter finding the right supplier to work with, it is important to know the characteristics of the products and the requirements placed on the distribution network. Although there are strict requirements of the cleanliness, humidity and temperature of the products, the requirements during distribution are considered low, according to Interviewee H. The reason for this is that the products are packed in aluminum bags directly after manufacturing intended as protection from environmental condition until use. The products have a very long lifecycle and the durability is determined to three years (Interviewee H). In the finished goods storage the products are placed in transportation cartons that are thereafter placed on pallets. The interviewee further mentions that an important requirement is that these pallets cannot be stacked onto each other, since this will damage the transportation cartons. The value related to the size of the carton is so low that the transportation has to be conducted by road, rail or sea freight to be profitable. Occasionally, in case of emergency, the products are sent with air transportation. Only pallets are sent in the transportation from the finished goods warehouse to the local warehouses. However, from the local warehouses to end customers, mostly parcels are sent.

The different warehouses, where the company stores their products at the moments, have compiled specific requirements from the customers in the respective countries along with activities that are performed in their warehouse. First of all, the lead times from the warehouses to customer are currently between one and three days. Overall, the competitors have longer lead times and it is uncertain how the customers would react if the lead times were increased. Therefore, the actual requirement for lead times is not determined, but for the sake of simplicity this thesis assumes that all customers should have a lead-time of 24 hours. Moreover, interviewee H mentions that the company has a goal of a stock service level of 99%. Repackaging is currently

performed in some of the warehouses. One reason for this is that some customers want to order other quantities than the number that are packaged in the finish goods warehouse in Sweden. The company does not know if this is a wish from the customers' side or an important requirement that cannot be changed in the future. However, the company sees this as an important option for customers and something that will remain in the future. Another common reason for repackaging is that customers want anonymous packages instead of boxes with the producers name on it. If repackaging is made, extra wrapping might be used to protect the product further during the last haul to customer. Moreover, in certain markets extra labeling is made for specific national requirements. Before the products are sent to customer, some of the warehouses are working as a distributor by consolidating other healthcare companies' products in the same shipment. In this way, the customer will receive one shipment with all their supplies. Again, it is uncertain if this is a wish from the customer or a requirement that would result in substantially reduced service level if removed. Another important aspect is that most products have different item numbers depending on which country they are to be sold in. There is no difference between products sold in, for instance, Spain or France, but due to differences in labeling and instructions the products gets different item numbers. This means that products that are meant to be sold in Spain cannot be sold in France. It should be noted, though, that 15-20% of the company's volume is sold without this country specific item number. The country specific item number therefore contribute to that the products becomes fixed to specific orders already when packed at the warehouse close to the case company's production plant. It should further be mentioned that the setup time for this packaging line is quite long, contributing to that the products for each country are generally packed and shipped once a week.

At the moment, the company's distribution costs is about 4,2% of revenue, according to interviewee G, and the cost for transportation is about 50% of that. Interviewee H states that the company is currently growing in a steady rate about 3% annually, which is expected to continue since the market is also growing. The company also wishes to grow from acquisitions in the future. The base demand for the company's product is very even since the customers consume the products with the same rate each day. The demand is even both on an aggregated level and on local markets. However, seasonal variations exist due to inventory build-up during the vacation periods of July as well as Christmas and New Year. The predictability of the demand results in that the company's forecast lies at the maximum 10% off on an aggregated level. The forecasts are much more off on low volume products or new products, however. The company's contribution margin is, according to interviewee H, just below 20%. Table 4 will summarize the above mentioned characteristics and requirements.

Table 4.1 Important characteristics and requirements of the case company.

Characteristics/ requirements	Comments
Requirements on cleanliness	High in general, but low during distribution
Transportation requirements	Pallets not stackable
Repackaging in the warehouses	Yes, due to different quantities sold to customers
Extra labeling in the warehouses	Yes, due to anonymity and special national requirements
Specific item numbers	Specific for products sold in different countries
Life-cycle	Long
Durability	3 year
Value/volume	Low
Demand variation	Very even, predictable seasonal variation
Demand growth	Approximately 3% annually
Forecast accuracy	Max. 10% off on an aggregated level
Distribution cost	4,2% of turnover
Service level	Goal of 99%
Contribution margin	Under 20%
Lead time	24 hours

4.2 Logistics as a business function

In the past, the supply function of the case company have not been prioritized, even though this seems to be changing to be a more recognized business function (interviewee G). According to interviewee H, the main goal of the logistics function is to ensure that the customer's requirements are met. It is hard to win new customers, but easy to lose those if the products cannot be delivered, according to the interviewee. The company's logistics performance is currently better than their competitors, which is a competitive advantage, and should be kept as it is. Basically that means to be able to supply customers within 24 hours and to have a service level of 99%. It should be noted, though, that the service level is also dependent on the output from production and currently varies between 95-100%. Furthermore, the interviewee states that the customers are satisfied with the logistics performance today, which means that the main goal for the company is primarily to reduce total logistics costs and secondarily to further improve service levels. The logistics function, therefore, is seen as a competitive advantage towards their competitors, but should only perform according to the current performance with as low costs as possible (Interviewee H). Furthermore, there is a lot of emphasis on tied up capital at the company to be able to invest money in other areas. Regarding investments, the owner requires a payoff time of five years. The company has enough logistics knowledge to be able to operate and develop distribution, as well as performing, for example, ABC classifications. However, when heavier system updates or calculations have to be done the company sometimes hires consultants. Interviewee G states, though, that the company has managed the whole logistics function on their own for a very long time and values the knowledge they have acquired.

4.3 Company's view of third-party logistics

The company has some 3PL warehouses today. According to interviewee G, this is because the company did not want to take the risk and make the commitment by having own warehouses in

local markets. Interviewee H argues that a 3PL provider is a specialist when it comes to logistics, and could therefore do the job very efficient. If a 3PL provider could perform the same task as the company do today to a lower cost that would be positive. However, the interviewee sees many negative aspects of logistics outsourcing as well. First of all, the interviewee states that it is harder to take part of process improvements, which the 3PL provider might just take themselves. Further, the company does not want to lose control over their material flows, which in the case of logistics outsourcing is in the hand of a supplier. There are also employees at the company with bad experiences of 3PL providers, which result in a negative attitude towards them (interviewee H). Apart from that, interviewee H states that it will be very hard politically to outsource the whole distribution network since the company will have to lay off personnel, which they have not had to do before. It should be noted, though, that the company's new owner does not consider this to be such a big issue. The resistance from local managers of the different sales companies will be hard to handle, however. All this means that the interviewee thinks that an outsourcing decision has to be well motivated to be able to be applied, and the 3PL provider will also have to show that they will make improvements that the company will be able to take part of.

5 Interviews and surveys

In this chapter, the result from the interviews and surveys will be presented. First, the interviewees will be presented. After that their view of drivers for and against logistics outsourcing, effects of logistics outsourcing, the outsourcing process and supplier selection strategy, as well as relationship management will be presented.

5.1 Interviewees

Interviewee A works as logistics director at a Swedish healthcare company and is responsible for the company's logistics in Europe, Middle East and Africa. The company have been outsourcing their distribution for over ten years, and have also redesign their distribution network in Europe from about 15 warehouses, outsourced to different 3PL providers, to three warehouses, managed by only two providers. Moreover, one of these providers takes care of most outbound transportation in Europe. The company has a standardized lead time of 48 hours to their customers, but when necessary they can reach them within 24 hours. Interviewee B works as warehouse and transportation manager at a Swedish apparel and accessories company. The company first outsourced their Swedish distribution in 2007 when the company got a new CEO. The 3PL provider took over the company's existing warehouse, but transportation was outsourced to another 3PL provider. In 2012, the company changed 3PL provider, as well as location of the warehouse, which was now located in the new 3PL provider's own distribution center. Interviewee C is manager of solution design at a large 3PL company, and is mainly involved with the company's warehouse activities. Interviewee D is supply chain director at a Swedish healthcare company. The company is quite small, with less than 500 employees. Moreover, they distribute their products in Europe with a customer lead time of about three days. The company currently manages their distribution in-house, but is planning an outsourcing study in the near future. Interviewee E is a transport manager at a Swedish distributor of healthcare products. The company has more than 1000 employees, and uses a 3PL provider for their national distribution with a customer lead time of 24-48 hours. Interviewee F is the supply chain director at a healthcare company. The company had outsourced their European distribution but decided to insource the warehouse activities again and only outsource transportation. All the interviewees and the type of company that they represent are summarized in Table 5.1.

Table 5.1 Interviewees and people responded to questionnaires.

Interviewee	Type of company	Position	Interview/ Questionnaire
A	Healthcare company (I)	EMEA logistics director	Interview
B	Apparel and accessories company	Warehouse and transportation manager	Interview
C	3PL company	Manager solution design	Interview
D	Healthcare company (II)	Supply chain director	Questionnaire
E	Healthcare company (III)	Transport manager	Questionnaire
F	Healthcare company (IIII)	Supply chain director	Interview
G	Case Company	Head of purchasing and supply	Interview
H	Case Company	Logistics developer	Interview

5.2 Drivers for and against logistics outsourcing

Interviewee B's company initiated the investigation to outsource their warehouse due to that they got a new CEO, who wanted change. Since the company owned their central warehouse and wanted to sell it to be able to free up capital, it was easy to also outsource the activities in the warehouse. This was also the opinion of interviewee A, whose company's decision to outsource one of their warehouses was initiated by the decision to sell the warehouse, to be able to free up capital for other investments. Moreover, interviewee B stated that the new CEO did not think that the company had either time or knowledge to do a better job than a 3PL provider. Interviewee B also stated that a companies' current situation is usually a driver to outsource. For instance, if the company has large distribution costs as a percentage of revenue or need to free up capital for other investments, logistics outsourcing is something that could be investigated. The interviewee suggested that if a company has higher logistics costs than 6-7% of revenue, logistics outsourcing should be looked at as an option. Interviewee E's company's driver to outsource distribution was firstly to be able to use the 3PL provider's infrastructure which meant that they could reach customers in the whole country rapidly, which they could not do on their own. Moreover, they found it positive that a 3PL provider could do value-adding services and also provide energy-efficient transportation. According to interviewee C, one aspect that drives companies to outsource logistics is lack of logistics knowledge. This is also related to the fact that many companies do not see logistics as a core competence, and therefore outsource it to a 3PL provider. Moreover, interviewee C stated that companies outsource logistics to gain better control of how big their actual logistics costs are, i.e. they get a number on an invoice instead of adding direct and indirect costs together. The interviewee also mentions that companies outsource logistics to gain flexibility and therefore does not have to plan the utilization of their resources for high and low demand periods. This is also the opinion of interviewee A, who argues that if a company grows, it is better to outsource logistics since investments becomes risks when the demand 5-7 years ahead is very uncertain. Interviewee C has a similar opinion, and argues that smaller companies should outsource their logistics operations so that they do not have to take the risk of

making infrastructure investments. The interviewee further argues that it is easier to put real demands on a 3PL provider than one's own organization due to that requirements can be put in a contract. Moreover, interviewee A argues that distribution is not their core competence and that they do not have, and do not want to obtain, the knowledge and infrastructure needed to carry out distribution in-house.

For interviewee D, whose company had not yet outsourced their distribution, the main drivers that could lead to an outsourcing investigation was to be able to decrease costs for warehousing and transportation activities. However, the requirements in the healthcare business were a driver not to outsource logistics. Other drivers not to outsource logistics are given by interviewee C, who argues that a 3PL provider cannot make investments in automatic storage technology, since they have to be depreciated over a longer period than the regular 3PL contract. The same is true for other long-term investments in technology. According to the interviewee, these technologies can otherwise improve efficiency in a warehouse to a large extent. The interviewee argues that if a company have invested a lot in their logistics operations and accumulated a lot of knowledge, there are also fewer motives to outsource the function, even though logistics is not the most complicated activity a company has to deal with. Interviewee A states that if the customers require special service or if the products are advanced to handle, it is less attractive to outsource distribution. Moreover, interviewee A's company have one product category that is so difficult to handle that they do it themselves. However, when that product matures, outsourcing will be an option, according to the interviewee. According to interviewee F, other drivers not to outsource logistics is that it is easier to perform value-adding and company specific services in-house, and that a 3PL provider will be quite expensive with regard to those services. Moreover, interviewee F considers that the daily contact with workers at an in-house warehouse is easier to handle than an outsourced. Further, personnel hired from employment agencies by a 3PL provider have low commitment towards the shipper, since they are only temporarily hired by the 3PL provider (Interviewee F). The size of the company is also important when considering logistics outsourcing, according to the interviewee. For small companies it is easier to motivate logistics outsourcing since they are too small to handle the function on their own. Furthermore, if the products require a high stock service level, it is better to keep distribution in-house since a 3PL provider is more competitive for standardized services. The opinion of interviewee B is that a 3PL provider cannot do the job much better than the company itself, especially if the company's products have quite stable and predictable demand and the company has logistics knowledge in-house. This is due to that it is easier to achieve high resource utilization in a warehouse if the product's demand pattern is stable and predictable. Another aspect that increases the productivity from an in-house logistics solution is the involvement of the personnel.

5.3 Effects of logistics outsourcing

The effect of outsourcing for interviewee B's company was not noticeable at first, since the 3PL provider just took over their warehouse and managed it very similarly. Moreover, when the company changed 3PL provider the productivity decreased at first, to increase after a year to the same level as before. The interviewee states that if the company would insource again they could

probably do the job at a lower cost, but with the same productivity. This is due to that no difference was seen between the 3PL provider's productivity and the productivity achieved in-house, but the company still pays for the 3PL provider's margin. Interviewee A states that at the 3PL warehouses where the 3PL provider had other companies, the operations were more efficient. However, at the warehouse where the 3PL provider only had the company's operations, the effect was not noticeable. Interviewee C, representing a 3PL provider, states that the most noticeable impact of a 3PL provider is that they can lower costs, and also create variable costs for their customers since they can charge per handled unit. A 3PL provider can achieve economies of scale at their warehouses, negotiate better deals with staffing agencies and also regulate the amount of staff much more often, as much as two times per day. They can also negotiate better deals with forklift suppliers, for instance.

None of the interviewees saw any big risks with logistics outsourcing. Interviewee B mentions that it could be a risk that the company loses logistics knowledge when outsourcing. However, interviewee F argued that the risk of losing knowledge is not that large, since there will always be employees at the company managing the 3PL relationship. These employees will therefore easily be able to retain logistics knowledge. Furthermore, if the company want to insource again, it is not hard to hire new personnel with relevant experience. Furthermore, interviewee B argues that it is possible to also gain knowledge from the relationship with the 3PL provider about logistics and distribution. This knowledge could be used if the company would insource again.

5.4 Outsourcing process and supplier selection strategy

According to interviewee F, it is important that the process of finding right 3PL providers is as detailed as possible. Moreover, the interviewee mentions that it is crucial to know how your company performs at the moment and to get a clear view of the requirements that are put on the distribution to be able to compare it with the potential outsourcing alternative. Companies must, at least, know important KPI's of their distribution, such as the current service level. At interviewee F's company, the potential outsourcing alternatives were weighted against the company's American warehouses' KPIs. This gave the company a way of measuring the performance of a warehouse operated in-house against the propositions collected from 3PL providers. Interviewee F also described that the selection strategy that was used when investigating the different 3PL provider alternatives was initiated by that 24 potential supplier was looked into. Of those, five 3PL providers received a detailed RFQ that was compiled to include all requirements that the supplier would need to fulfill. The answers from the RFQ were then compared with the in-house alternative by using a weighting matrix. In the matrix the most important aspects, such as cost, service level etc., was given a value, which in turn was multiplied with the respective weight to sum up a total score. In this case the in-house alternative had the lowest total cost and the highest score. Moreover, the investments that were needed to be made were planned to be paid off in one year.

The selection strategy for the companies that interviewee A and interviewee B represents looked quite similar to the one explained above. Interviewee A's company started by making a study where the objective was to centralize the warehouse structure for the distribution in Europe. The

result from this study was that the company would have three regional warehouses to cover the demand in the whole Europe. Detailed RFQ's were sent out to various suppliers that were then compared depending on how well they fulfilled the requirements that the company had compiled. The most important aspects in this case were price, the size of the 3PL provider, the service they could contribute with, but also how much the supplier would invest in a long-term relationship with the company. Interviewee A's company saw a great advantage with outsourcing to only one 3PL provider to be able to develop improvements together and a standardized way of working. Therefore, most transportation work was outsourced to the same company that took care of the largest part of the warehousing activities. According to interviewee A, this is an advantages since the 3PL provider can gain economies of scope by combining these activities. The selection process for interviewee B's company was not as detailed as for the two previously mentioned companies, but consisted of that 5-10 3PL providers were first looked into when the national warehouse in Sweden were first outsourced. Of those, three providers received a RFQ. The interviewee further stated that transportation was outsourced to another 3PL provider that had parcels delivery as their core competence, since parcels were the main type of consignment. Interviewee C, that represent a 3PL provider, mentions that it takes about 3-6 months implementation time to outsource these types of warehouse operations to a 3PL provider. This estimation only consists of operations in one warehouse and does not include multiple warehouses or the transportation in between. Therefore, interviewee C's company rejects half of the customers that come with requests, since each customer is a big investment.

5.5 Managing 3PL relationships

Interviewee C, representing a 3PL provider, mentions that contracts with buyers are commonly written on 3-5 years. These contracts often include how efficiency improvements should be divided between the two companies. Typically, according to the interviewee, efficiency improvements are divided 50/50. However, according to interviewee B, improvements are not divided equally between the two parties and the interviewee wishes that the contract that they have with their 3PL provider would be more transaction-based instead of the usual contract with surcharge of an agreed percentage. Interviewee C further mentions that the procurements are categorized by tough negotiations, even with previous customers. Furthermore, interviewee A, representing a company that work closely together with mainly one large 3PL provider, have longer contracts on six years to make it possible to develop mayor improvements. Interviewee A's company is also working together with some smaller 3PL providers, which they have shorter contracts with.

According to interviewee B, there is two possible ways when outsourcing logistics to a 3PL provider. Either a company outsources everything and do not interfere with how the 3PL provider work, or work really close with the supplier(s). Interviewee F mentions that even though a decision is taken to outsource the distribution to a 3PL provider, a company still needs knowledge about distribution within the company to manage the relationship with the supplier. The interviewee further mentions that if the knowledge is lost within the company it will be hard to evaluate the 3PL provider in a good way. Interviewee E also believes evaluation is important and

mentions that they evaluate the 3PL provider monthly through KPI's and yearly through larger supplier evaluations.

Apart from evaluations, interviewee E sees honesty and transparency as crucial to manage 3PL relationships. The desire to work with continuous improvements was also mentioned by interviewee E as a key aspect for successful relationships. Interviewee B agrees with these thought and mention that close collaboration is needed to succeed. Moreover, interviewee B points out that suggestions for improvements should come from both parties and not only from the 3PL provider. In the relationship that interviewee B's company has with their 3PL provider, it is even so that the 3PL provider has come with the least number of improvements and this was seen as a disappointment according to the interviewee. Interviewee C, representing a 3PL provider, argues that commitment and time from the customer is most important for successful 3PL relationships. Moreover, interviewee C also mentions that information needs to be shared so that the 3PL provider will be able to adapt to changes.

In order to conduct improvements, interviewee B mentions that an open dialog is needed. Aside from the standardized meetings that they have with their 3PL provider, the interviewee believes that daily concerns should be raised directly with the 3PL provider. From a 3PL providers point of view, interviewee C mentions that communication with buyers are standardized to weekly meetings between representatives from the production departments and larger meetings four times per year with the account managers. According to interviewee A, the relationship is based on long-term focus, trust and an integrated cooperation all the way up to the top management level. Furthermore, interviewee A mentions that the personal relationships between individuals within the two companies are crucial for the overall business relationship. Thus, the business relationship is dependent on many small events between individuals within the two companies. However, the interviewee also mentions that the business relationship cannot be built on only individual relationships since it then becomes more sensitive. A complete list of the interviewees' views of drivers for and against logistics outsourcing, effects of logistics outsourcing, the outsourcing process, supplier selection strategy and the management of the 3PL relationship can be seen in table 5.2.

Table 5.2 Result from empirical study

Interviewee	Aspects			
	Drivers	Effects	Outsourcing process	Managing 3PL relationships
A (Healthcare company)	**For:** Free up capital, competitive advantage if uncertain demand, not core competence **Against**: Advanced products that are difficult to handle	More efficient warehouse operations where the 3PL provider has more customers within the same warehouse.	Sent out detailed RFQ to potential suppliers. Important requirements were price, size of 3PL provider, services and future investment in the relationship	6 years contract to develop mayor improvements. Relationship based on long-term focus and trust. Personal relationships important!
B (Apparel and accessories)	**For:** New CEO, Free up capital, lack of time and knowledge, reduce logistics cost. **Against**: Involvement of personnel, 3PL have no competitive advantage if demand is stable and predictable	No direct effect, possibly more expensive since productivity is the same. Opportunity to gain logistics knowledge from the 3PL provider. However, could be a risk that logistics knowledge is lost.	5-10 potential suppliers for the central warehouse, where 3 received a RFQ.	Not receiving a 50/50 share of efficiency improvements. Wish to change to more transaction-based contract. Close collaboration and open dialog outside of standardized meetings is important for success.
C (3PL provider)	**For**: Lack of knowledge, not core competence, better control of logistics cost, flexibility, no need for infrastructure investments **Against**: 3PL cannot make dedicated investments, due to short contracts	Lower and variable costs, due to economies of scale.	3-6 months implementation time for outsourcing warehouse operations to one warehouse, half of the customers is rejected.	Contracts commonly 3-5 years, improvement efficiencies divided 50/50. Commitment and time most important aspects for successful 3PL relationships. Standardized communication.
D (Healthcare company)	**For**: Decrease total distribution cost. **Against**: Requirements in the healthcare business			
E (Healthcare company)	**For**: Access to 3PL provider's infrastructure.			3PL evaluation through monthly KPI's and yearly through larger supplier evaluations. Honesty, transparency and willingness of working with continuous improvements important for the relationship
F (Case company)	**For**: Small growing company. **Against**: Value adding and company specific services, easier contact with distribution personnel, high service level requirements.		Important to know the current state and KPI's, weight potential 3PL providers' performance against in-house alternative by sending out detailed RFQ.	Knowledge still important to have in-house after outsourcing, to handle the 3PL relationship and conduct good evaluation.

6 Analysis

This chapter will go through the five phases of the analytical framework introduced in section 2.4.

6.1 Future state (phase one)

This phase will analyze how the products and the market context affect the way the case company's distribution network should be designed. In section 6.1.1.1 the case company's products will be categorized according to Fisher (1997) and in section 6.1.1.2 their distribution network design will be analyzed. Further, in section 6.1.2, a future distribution network will be developed according to a 3PL provider's preferences. Phase one will then serve as input to the outsourcing decision, as illustrated in Figure 6.1.

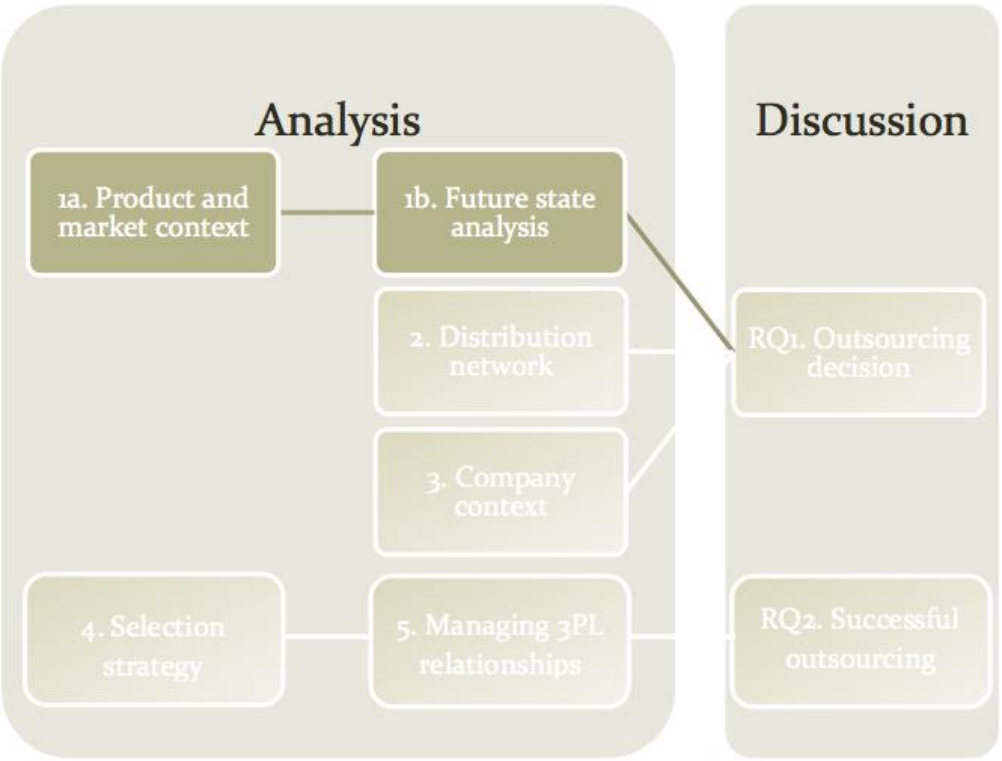


Figure 6.1 Phase one in the analytical framework.

6.1.1 Product and market context

This section will categorize the case company's products according to the model by Fisher (1997), and analyze the case company's customers' requirements impact on the distribution network.

6.1.1.1 Product categorization

In the theoretical framework a model to categorize products was developed according to Fisher (1997). The case company's products are, according to this model, functional due to that their products are standardized and the contribution margin for the products is between 5-20% (Table 6.1). The product variety was also found to be low, where each product category consists of a fixed set of product variants. Moreover, due to the standardized range of products and that the demand

for order specific products is low, the lead-time for time-to-order products are long. The product lifecycle was also found to be long and definitely longer than the two years that were mentioned as a limit in the categorization model. The stock-out rate were somewhere between 1-5% and the mark-downs were negligible, as a result of the standardized product assortment and the high product life cycle. As a result of all these characteristics the demand can be seen as predictable, where statistics from previous years were found to be useful. Furthermore, the demand was found to be varying during the year, due to of vacations and holidays, but these fluctuations are known to the company. The forecast error was therefore found to be at a maximum 10%. The complete product categorization of the case company can be found in Table 6.1.

Table 6.2 Product categorization of the case company.

Aspects of demand	Functional (Predictable demand)	Innovative (Unpredictable demand
Product life cycle	More than 2 years	3 months to 1 year
Contribution margin	5% to 20%	20% to 60%
Product variety	Low (10 to 20 variants per category)	High (often millions of variants per category)
Average margin of error in the forecast at the time production is committed	10%	40% to 100%
Average stock-out rate	1% to 2%	10% to 40%
Average forced end-of-season mark down as percentage of full price	0%	10% to 25%
Lead time required for made-to-order products	6 months to 1 year	1 day to 2 weeks

As a result of the functionality of the case company's products, their focus should be to make their supply chain as efficient as possible as long as the customer requirements on service performance are met. Further, this was also found to be the opinion of the case company, since interviewee H stated that the main objective of the logistics function is to meet the requirements of the customer at the lowest cost possible.

6.1.1.2 Customer requirements' impact on the distribution network

The most important customer requirements imposed on the case company's products are lead-time and stock service level, which are set to 24 hours and 99%, respectively. The lead-time will have a great impact on the distribution structure, since it will impose constraints on the location and the number of warehouses. This is especially true since the product's value compared to its volume is quite low, which result in that they have to be transported by road, rail or sea transportation since air transportation is usually not profitable for these kinds of products. If air transportation would be an option, it would be possible to have just one warehouse to supply all

customers in Europe within 24 hours. The exact lower limit of warehouses will have to be calculated. However, interviewee A's company strived to have as few warehouses as possible. With a customer lead-time of 48 hours they needed three warehouses to supply Europe with road transport. Therefore it is reasonable to assume that the case company needs at least three warehouses to be able supply Europe within 24 hours. Of course, this also depends on the ability of the freight forwarder, as well as the locations of both the warehouses and the customers. The appropriate number of warehouses for the case company will be discussed in section 6.1.2.1.

The stock service level limits the number of warehouses, due to that a high service level requires a large safety stock (Jonsson & Mattsson, 2009). This is due to that if a large safety stock is needed, it will be very expensive to have many warehouses since each warehouse will have to carry its own safety stock. With a required service level of 99%, as few warehouses as possible would then be recommended. However, in the case company's case, most products have a country specific item number. This result in that the number of warehouses does not impact the safety stock in the same extent as it normally would. Still, a part of the assortment is sold with the same item number, which will benefit from a centralized warehouse structure. Moreover, the cycle stock could be decreased if fewer warehouses were used since more frequent replenishment transportations could be carried out without having to transport less than full truck loads. So in total, the inventory levels could be decreased with a reduction of warehouse, although to a lesser extent than normally.

Other requirements that are normally put on the healthcare industry are requirements on the level of, for example, cleanliness, temperature and humidity. For instance, interviewee H states that the case company's products needs a certain temperature and humidity to keep their function, and some of interviewee A's company's products needed a clean environment as well. These requirements could benefit from a warehouse structure with few warehouses since it could be too costly to make investments in technology that is needed to keep the right ambient environment in many warehouses. Regarding the case company's products the products are not removed from their customer cartons. This results in that the products do not have these requirements during distribution. Hence, these requirements do not affect the distribution network design.

As discussed in chapter 2, distribution costs can be divided into transportation costs, inventory costs, warehouse and handling costs, and costs of lost sales. Transportation costs seems to be little affected by the number of warehouse, since few warehouses result in high last mile costs but low replenishment costs, and many warehouses result in low last mile costs but high replenishment costs. The inventory cost usually decreases when the number of warehouses is decreased. However, as discussed above, the effect for the case company is smaller than normal due to country specific item numbers. The inventory cost would decrease with decreased number of warehouses to some extent, though. Regarding costs of warehouses and handling it could be assumed to decrease with decreased number of warehouses. Costs of lost sales will probably be unaffected by the number of warehouse, as long as the lead-time and stock service level

requirements are met. This is due to that the local sale companies could be separated from the physical distribution. So in total, the distribution costs will probably decrease to some extent with decreased number of warehouses. Therefore, the distribution structure should contain as few warehouses as possible as long as the customers can be supplied by road transportation within 24 hours. Moreover, the warehouses should also be strategically located to be able to minimize the transportation distances and thereby the transportation costs. This is based on the conclusion from section 6.1.1 that the company should focus on reducing cost as much as possible as long as the requirements are met.

6.1.2 Future 3PL distribution network

This section will present how a future distribution solution for the European market could look like if it is completely outsourced to a 3PL provider with regard to the arguments developed in section 6.1.1. Moreover, a 3PL provider will give an estimation of the cost of operating the distribution network.

6.1.2.1 3PL distribution network analysis

The future distribution structure will be based on a 3PL provider's preferences, with the requirement that customer orders to Sweden, Denmark, Norway, Finland, United Kingdom, Austria, Nederland, Belgium, Luxemburg, Germany, France, Spain, Italy and Switzerland are delivered within 24 hours. However, for the most remote customers this lead time could be longer to be able to be closer to the majority of customers without having too many warehouses. The warehouses should be located in the 3PL provider's existing network, where they have other customer's inventories as well, to be able to take advantages of economies of scale and synergies. Moreover, the number of warehouses should be as few as possible.

The first suggestion from the 3PL provider can be seen in Figure 6.2. In total there are five warehouses. The warehouse located in Umeå will supply Finland, north of Sweden and north of Norway. The warehouse located in Oslo will supply south of Norway, south of Sweden and Denmark. In Brussels a warehouse will be located that supplies Germany, United Kingdom, France, Belgium, Nederland and Luxemburg. In Milan a warehouse will be located that supplies Italy, Switzerland and Austria, and in Madrid, there will be a warehouse that supplies Spain.

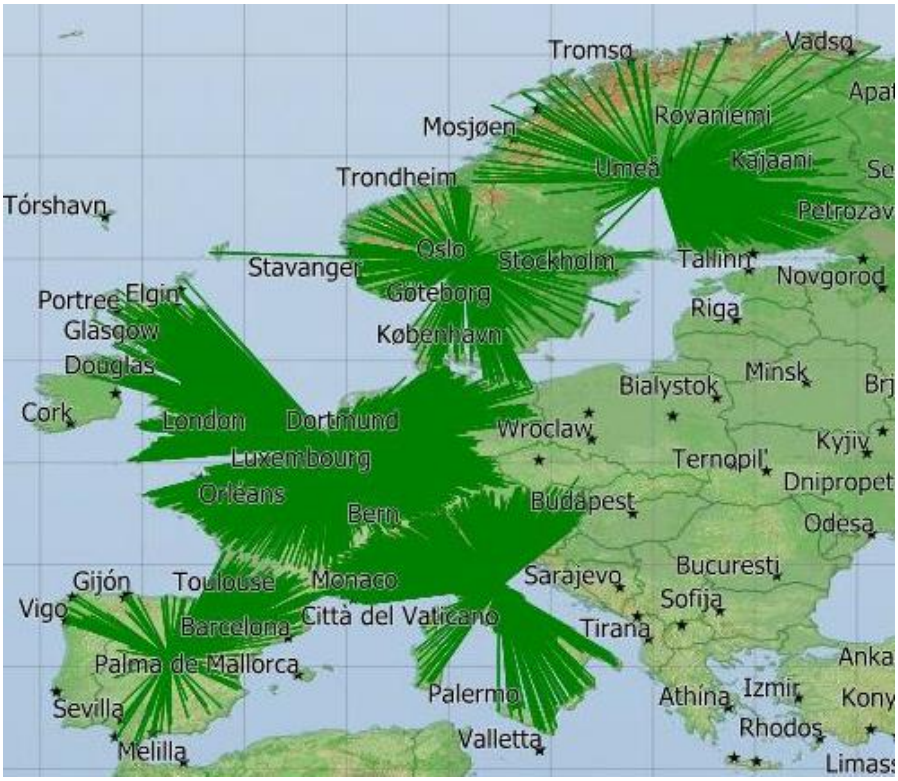


Figure 6.2 First distribution network design suggestion from 3PL provider.

The above mentioned distribution network have some issues. Firstly, some countries are supplied by more than one warehouse. This is an issue since the case company use country specific article numbers, and would therefore have to keep a safety stock for these articles in more than one warehouse. Therefore, in the future state, each country should only be supplied by one warehouse. Secondly, the warehouse in Umeå is located high up north to be able to supply some remote customers in northern Sweden and Finland within 24 hours. This warehouse will be located in Stockholm instead, resulting in that a few customers will receive a higher lead time but the warehouse will be closer to the majority of customers. This will increase the service for the majority of customers, and also decrease the last mile transportation costs. The suggested distribution network developed together with the 3PL provider can be seen in Figure 6.3, and contain five warehouses located in the 3PL providers current network.

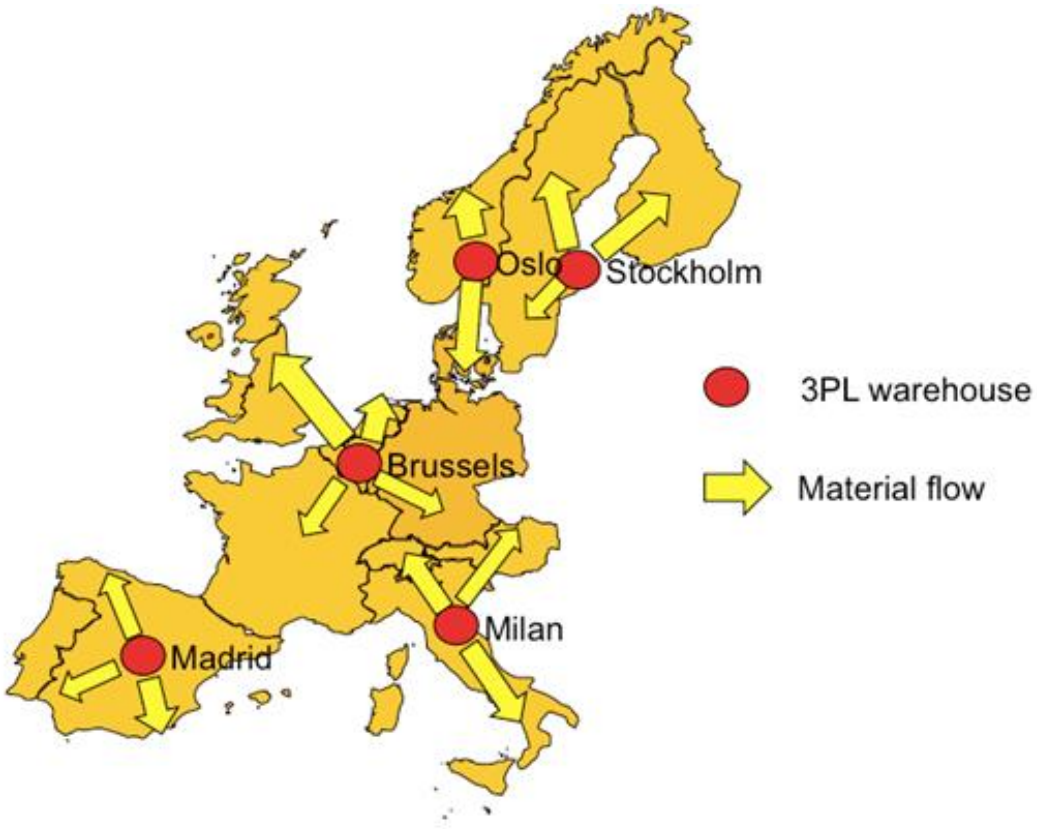


Figure 6.3 Future distribution network.

The warehouses are located in Oslo, Stockholm, Brussels, Milan and Madrid, and the countries that each warehouse will supply can be seen in Table 6.2.

Table 6.2 Warehouses in future distribution network

Location	Supplied countries
Oslo	Norway and Denmark
Stockholm	Finland and Sweden
Brussels	Nederland, Belgium, Luxemburg, France, United Kingdom and Germany
Milan	Italy, Switzerland and Austria
Madrid	Spain

6.1.2.2 Cost estimation

Considering the distribution network developed in the previous section, a cost estimate of the outbound distribution cost, excluding the transportation cost, was calculated by the 3PL provider to enable a comparison with the current cost for the case company's outbound distribution. In order to perform this cost estimate a number of assumptions had to be made. To begin with, the material cost for pallets, packaging material and labels was not included in the estimate. Moreover, the personnel cost for some value adding services, such as relabeling and stocktaking,

was not included in this estimate. The total cost was divided into a number of cost centers, to more easily display which activities that contributes most to the total cost. The result can be found in Table 6.3 and in Figure 6.4, where the cost centers for each warehouse is presented as a percentage of revenue. As can be seen in the table, the total cost for the distribution, excluding transportation, is almost one percent of revenue. The largest part of this cost comes from personnel cost (0,425%). Moreover, the warehouse that has the highest cost is the one located in Brussels (0,54%). This is not surprising, since the warehouse in Brussels is supplying more countries than the other warehouses. The costs for the remaining warehouses are quite similar.

Table 6.3 Distribution costs, excluding transportation, for each warehouse and in total.

Cost center	Stockholm	Oslo	Brussels	Madrid	Milan	Total
Blue collar cost	0,038%	0,034%	0,291%	0,015%	0,032%	0,41%
Facility	0,049%	0,028%	0,083%	0,009%	0,017%	0,186%
Material handling equipment	0,006%	0,006%	0,036%	0,006%	0,008%	0,061%
Depreciation	0,009%	0,006%	0,023%	0,004%	0,006%	0,049%
IT	0,014%	0,014%	0,031%	0,013%	0,016%	0,087%
Administration	0,018%	0,027%	0,071%	0,012%	0,012%	0,140%
Training	0,002%	0,002%	0,008%	0,002%	0,002%	0,016%
Total price	0,14%	0,12%	0,54%	0,06%	0,09%	0,95%

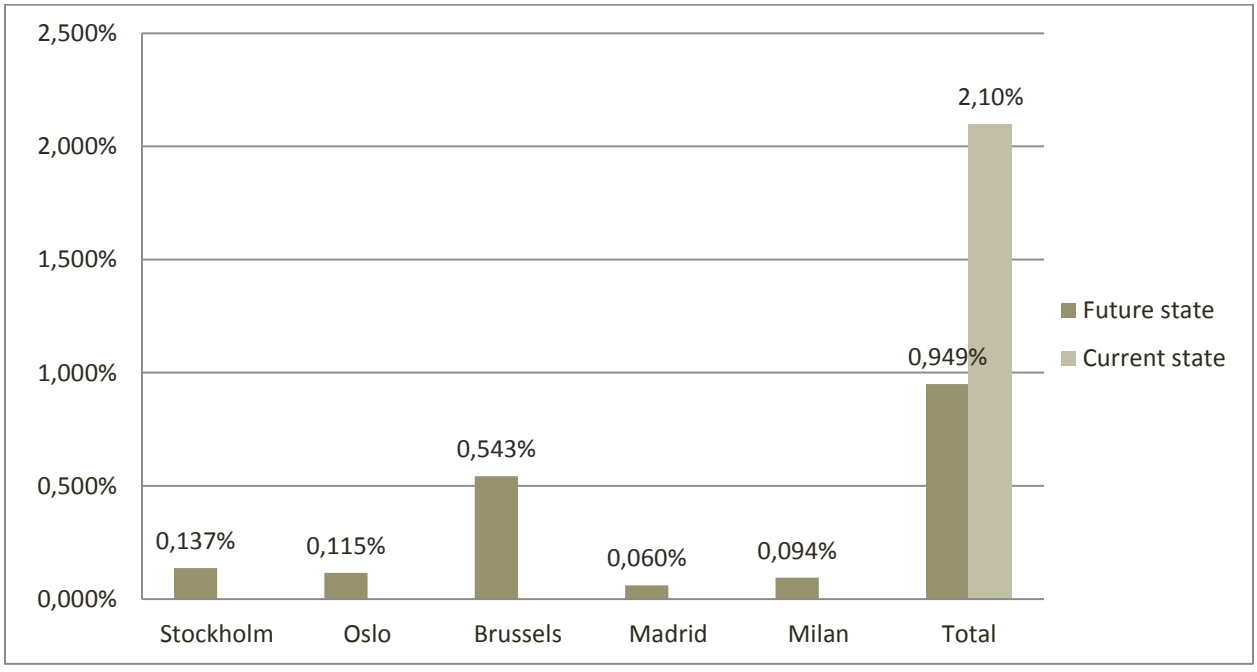


Figure 6.3 Distribution cost in percentage of revenue, excluding transportation, divided on the different warehouses

6.1.2.3 Future scenarios

If some aspects of the company would change in the future, the distribution network could have a different design than the one that was described above. The most important aspects are customer lead-time and the country specific article numbers. These aspects influence the distribution network design. The first future scenario would be to increase the lead-time. As stated in chapter four, the lead-time of 24 hours is not a requirement for all customers and even though it is convenient for the customers, it is not certain that the company would lose customers if the lead-time would be increased to 48 or 72 hours. The effect of an increased lead-time would be a decrease in the number of warehouses in the distribution network, since there is less need for the products to be stored close to customers. For example, interviewee A's company have a lead-time of 48 hours and need three warehouses to reach their European customers. As in section 6.2.1.1, a 3PL provider was asked to give a suggestion of number and location of warehouses if the lead-time is set to 48 hours. The result can be seen in Figure 6.5 and include two warehouses. One is located in Milan, and should supply Spain, Italy, Austria and Switzerland. The other one is located in Kolding, and should supply Sweden, Denmark, Norway, Finland, United Kingdom, Nederland, Belgium, Luxemburg, Germany and France.

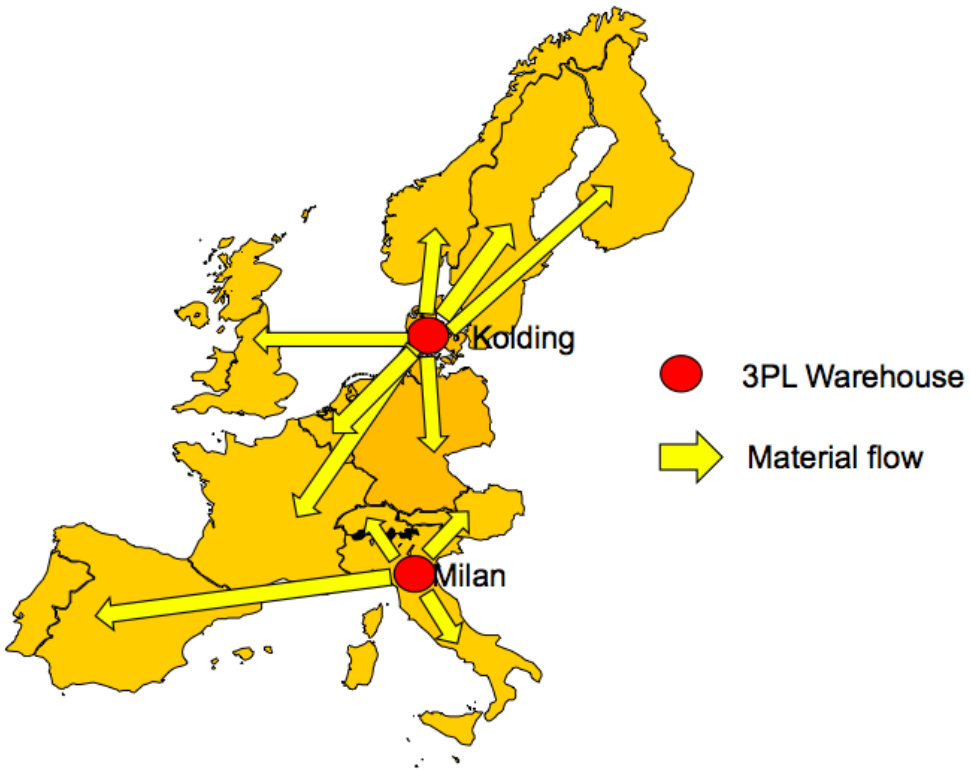


Figure 6.5 Future distribution network with 48 hours lead-time.

Another future scenario is to get rid of the country specific article numbers, and sell the products in the same form in all countries. The effect of that would be twofold. First of all, the safety stock

could be reduced much more when decreasing the number of warehouses. Secondly, it would be possible to send more frequent replenishment orders to the warehouses since there would be fewer setups in the packaging lines. This would therefore also decrease the turnover stock. The largest effect would come from combining the two above-mentioned scenarios. This is due to that a reduction in lead-time would only reduce the number of warehouses but not the inventory to a large extent, due to the country specific article numbers. Moreover, to get rid of the country specific article numbers without reducing the lead-time would not reduce the inventory to a large extent either since local inventories are still needed. There are issues regarding these future scenarios, though. First of all, the current lead time of 24 hours is seen as a competitive edge over competitors and it is therefore reasonable to believe that the company could lose some customers if the lead time is increased. Furthermore, the country specific article numbers are very good to use since different countries have different rules and regulations regarding the case company's products.

6.2 Distribution network (phase two)

In this phase, the attractiveness of a 3PL provider will be analyzed with regard to a company's distribution network. This phase will then serve as input in order to answer research question one, as illustrated in Figure 6.6.

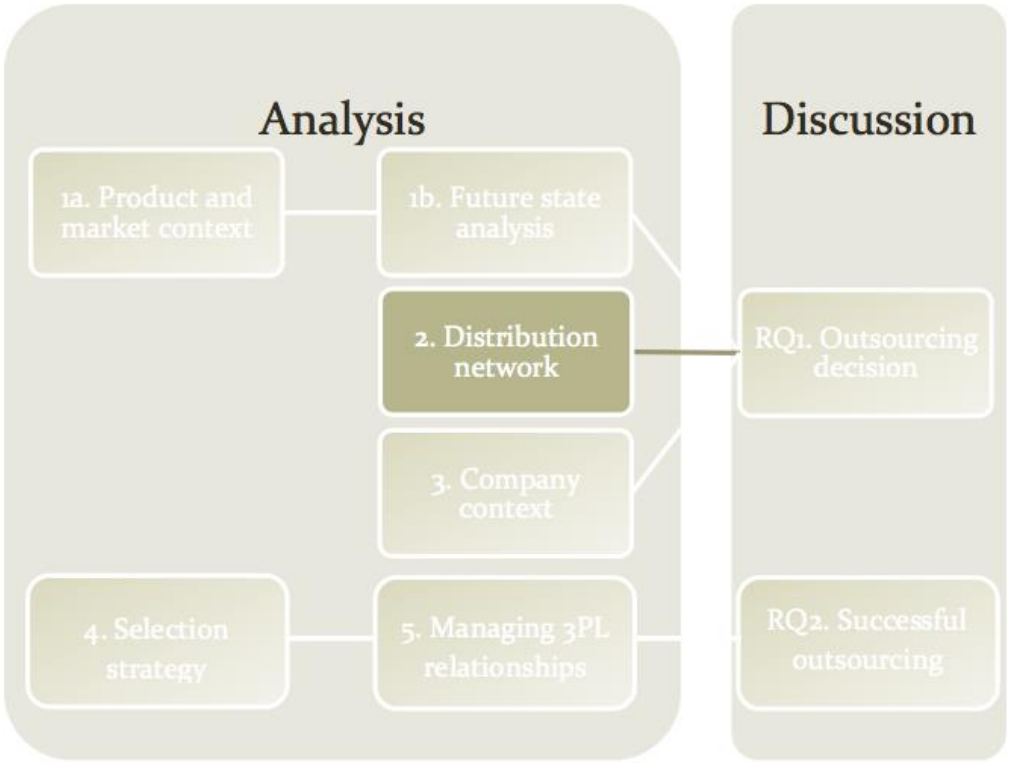


Figure 6.6 Phase two in the analytical framework.

From the interviews, it seems to be a common understanding that a 3PL provider can contribute to increased performance as a result of economies of scale and by obtaining synergies between different customers. For example, interviewee C argues that since 3PL providers often have a number of customers they can achieve economies of scale in terms of sharing the cost for facilities, warehouse equipment and personnel, resulting in higher resource utilization. However, if a company has large physical flows of products themselves the attractiveness of the 3PL provider becomes lower. Interviewee C mentioned that one of their previous customer decided to insource again when they became large enough to achieve economies of scale themselves. This is due to that when a company can achieve the same economies of scale as the 3PL provider can, it is less justified to outsource and thereby pay for the 3PL provider's profit margin. Moreover, if a company centralizes their warehouse structure it becomes cheaper to invest in technologies that improve the efficiency in the warehouse. As was mentioned by interviewee C, a 3PL provider cannot, due to the size of the investment and the short lengths of the contracts, invest in customer dedicated automation technology and special equipment in a way that a company can do in their own warehouses. However, a 3PL provider's ability to even out demand fluctuations

between different customers could make them more efficient in a distribution network containing local warehouses. This is due to that demand fluctuations are often larger in local markets than on an aggregated level. All in all, the above mentioned arguments result in that a 3PL provider can be more efficient than an in-house distribution solution if the distribution network consists of many small warehouses, compared to a few larger warehouses. If the distribution network have few larger warehouses, it is possible to achieve economies of scale and high resource utilization in-house due to large flow of goods through each warehouse.

By the same reasoning, the attractiveness of a 3PL provider reduces for companies selling products that require special handling. As in the case of interviewee A, where the products required a clean environment and vaccinated personnel, outsourcing would only be an option if the potential 3PL provider could invest in these special treatments. However, the scale advantages that advocate 3PL providers are decreasing since it is more difficult for a 3PL provider to find other companies that have similar requirements for the distribution. This was the reason why interviewee F mentioned that special services and value-adding services are commonly more expensive when performed by a 3PL provider as a result of the difficulty for the 3PL provider to gain economies of scale and synergies by combining assortments of other customers, and why interviewee D looked with skepticism on outsourcing the distribution of their healthcare products to a 3PL provider. Thus, some of the activities that are performed in the case companies' warehouses today, such as adding local assortment for customers in some markets, repackaging and relabeling can be seen as activities that are value adding and will probably require more than a standard solution from a potential 3PL provider.

From the interviews it was found out that to obtain an increased performance when outsourcing logistics to a 3PL provider, the future distribution design should be based on the suppliers existing network of warehouses. For example, in the case of interviewee B, the 3PL provider only took over the operation of the company's existing warehouse, resulting in that the performance was rather unchanged. Interviewee F's company had a similar outsourcing arrangement, where the 3PL provider only had interviewee F's company's operations in the warehouse. This was probably one reason why the company chose to insource again, since they could perform the job at the same cost and thereby avoid paying for the 3PL provider's profit margin. Further, in the case of interviewee A, it was a difference in performance between the warehouse that were only taken over by a 3PL provider and the warehouses that was located in the 3PL providers existing network. It is reasonably to believe that the reason for this is that the 3PL providers that only took over the operations of the warehouses could not achieve synergies in terms of sharing, for example, personnel and warehouse equipment between other customers in the facility to achieve higher utilization, and economies of scale, where the cost for the facility is shared between these customers. Therefore, the advantages of a 3PL provider are most profound when the warehouses are located in the 3PL providers existing network. The main arguments from phase 2 are summarized in Table 6.4.

Table 6.4 Aspects that affect the outsourcing decision.

Aspect	Comments
Number and size of warehouses	If the distribution network consists of many small warehouses, a 3PL provider is more attractive than if the opposite is true.
Value adding activities and special services	A 3PL provider will have a hard time performing value adding services and customer specific services at a lower cost than the outsourcing company.
Location of warehouses	A 3PL provider has the largest advantages if the customer's inventory is located in the 3PL providers existing warehouses, where the provider have other customers.

6.3 Company context (phase three)

This section will analyze how a company's context affect the decision to outsource logistics, as can be seen in Figure 6.7.

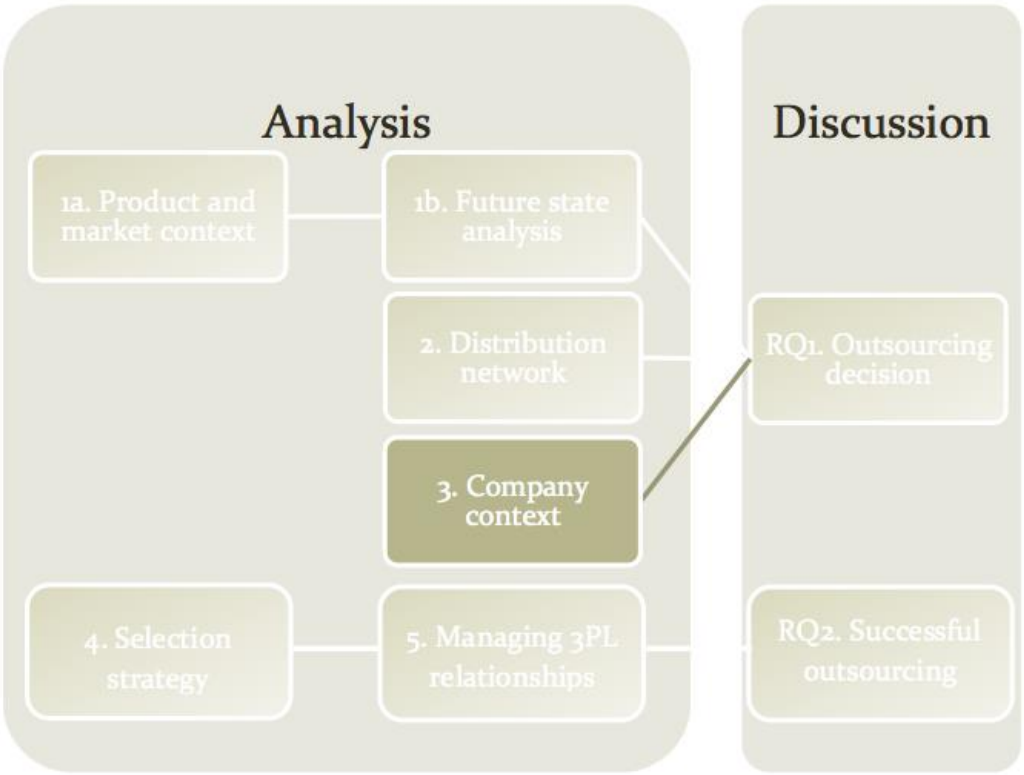


Figure 6.7 Phase three in the analytical framework.

If a company's logistics performance is seen as a competitive advantage, it is important that their current performance is maintained if logistics is outsourced to a 3PL provider. For example, if the function is outsourced to a 3PL provider, the company might lose control of the stock service level. The stock service level seems to be very important in the healthcare industry. For example, interviewee H, who represents the case company, mentioned that a low stock service level result in backorders, which in turn result in penalties and loss of customers. However, interviewee C argues that if companies outsource distribution, service level requirements can be agreed upon in a contract and the 3PL provider will then have to maintain the specified service level to avoid a penalty themselves. The risk of backorders is thereby transferred to the 3PL provider. Issues with this type of reasoning are, however, that since the service level is also dependent on the output from production, it is hard to decide which company is responsible for the backorder. Moreover, the 3PL provider might try to increase the safety stock as much as possible to avoid backorder penalties, which would unnecessarily increase the capital tied up in inventory. Therefore, it is important that the 3PL provider show that they can keep, or preferably increase, the service performance if the outsourcing company views logistics as a competitive advantage.

Lost logistics knowledge is a risk to consider when outsourcing distribution to a 3PL provider. For example, interviewee B mentioned that lost logistics knowledge could be a risk with logistics outsourcing since the outsourcing company stops operating the activities. However, as interviewee F argues, this knowledge is quite easy regain again by hiring new personnel if the distribution would be in-sourced again in the future. It should be noted, though, that interviewee F's argument was based on a decision concerning only one central warehouse. If the distribution network contains more warehouses it might not be as easy to find experienced personnel to operate each warehouse. General logistics knowledge will probably not be lost if distribution is outsourced, however. Since it seems like logistics knowledge is a great advantage when managing a 3PL relationship, it will still be used and subsequently maintained within the company. For example, the outsourcing company will have to keep track of how the distribution network looks like and keep control over the most important KPI's. Moreover, as interviewee B argues, it is also possible to gain knowledge from the 3PL provider since the 3PL provider can share experience from their other customers. So, in general it seems like it is only operative logistics knowledge that will be lost if distribution is outsourced. This knowledge is, however, quite easy to regain by hiring the right personnel.

The growth of a company could have an effect on how an outsourcing decision. Interviewee F and A argue that when a company is growing rapidly and with low predictability, logistics outsourcing is more attractive than if the opposite is true. This seems reasonable since a 3PL provider has other customers and can thereby achieve high resource utilization in their warehouses even if one of them is growing quickly. If a company operates their own warehouse, and their sales volumes are growing with a high unpredictable pace, they will need to have a lot of overcapacity to reduce the risk of not being able to supply their customers. This will be costly, and also financially risky since the capacity needed a couple of years in the future is hard to forecast. If the company is growing at a smaller more predictable pace, however, the capacity will be much easier to calculate. This results in that the utilization of resources could be much higher. So, in general it appears that a 3PL provider is more attractive for a company that has high and/or unpredictable demand growth.

A commonly cited effect of logistics outsourcing is that it can free up capital in facilities, such as warehouses. For example, both interviewee A and B stated that their companies saw an advantage with the outsourcing decision since they were able to free up capital when selling their warehouses. However, this argument is not that strong since it is also possible to sell the warehouse and then rent it instead. The argument that an outsourcing decision switches fixed costs into variable costs seems valid, however, because if a company sells their warehouse to be able to rent it, the rent is still a fixed cost that is not dependent on the flow of goods through the warehouse. When outsourcing to a 3PL provider, the cost is dependent on the flow of goods, and therefore variable. Another aspect that seems to affect the outsourcing decision is the size of the company. As interviewee F argues, a small company will have a hard time devoting staff to perform and develop the logistics function, as well as to be able to achieve economies of scale in operations. It is more reasonable to assume that a larger company, i.e. a company with large

material flows through their outbound distribution, could have that ability. Furthermore, a company's logistics costs as a percentage of revenue could have an impact on the outsourcing decision as well. If the costs are very high, a 3PL provider could probably be able to lower the costs substantially. If the costs are low, however, a 3PL provider will have a hard time reducing the costs as much as it is needed for both the 3PL provider and the outsourcing company to profit from it. Interviewee B states that distribution should be outsourced if the current distribution cost is higher than 6-7% of revenue. However, it should be noted that this number is probably dependent on the industry that the company operates in, and every company should benchmark against their competitors to find an appropriate number. The above mentioned argument result in that the need to switch fixed costs to variable costs, the size of the company as well as the company's distribution costs in proportion to revenue have an impact on the outsourcing decision. The main arguments from phase 3 are summarized in Table 6.5.

Table 6.5 Aspects that affect the outsourcing decision.

Aspect	Comments
View of logistics function	If the logistics function is viewed as a competitive advantage, outsourcing should only be a considered if the 3PL provider can maintain the service performance.
Logistics knowledge	Only operative knowledge is lost when outsourcing logistics. This knowledge is, however, quite easy to get back.
Growth of a company	If a company is growing fast and unpredictable, a 3PL provider is more attractive than if the opposite is true.
Fixed to variable costs	If a company wants to switch fixed costs into variable costs, logistics outsourcing is an option.
Size of a company	The larger the company, the less attractive a 3PL provider becomes.
Distribution costs	If a company has high cost for distribution in proportion to turnover, compared to competitors, a 3PL provider could lower these costs.

6.4 Supplier selection strategy (phase four)

This section will analyze the supplier selection strategy when outsourcing logistics, including the selection process, the choice of number of suppliers to work with and how to reason when deciding what selection criteria to use when choosing 3PL providers, as illustrated in Figure 6.8.

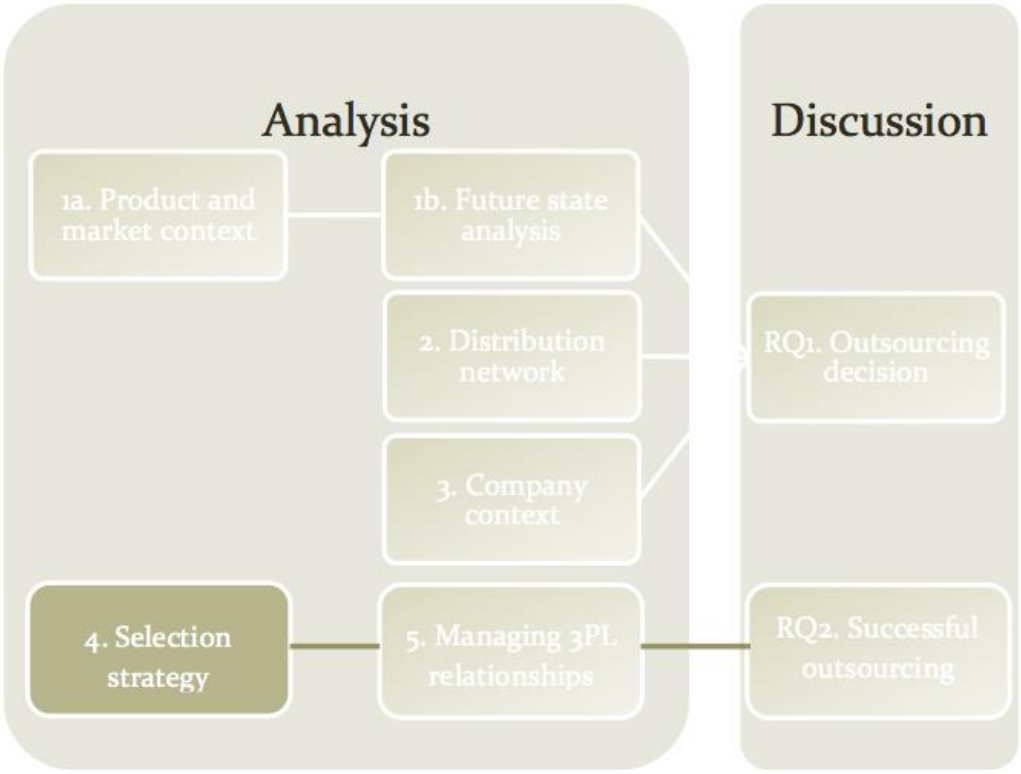


Figure 6.8. Phase four in the analytical framework.

6.4.1 Selection process

In general it seems like the more time spent on the supplier selection process, the better the chance of finding a business partner that will contribute to a successful result. For example, as interviewee F mentioned, the process of finding the right 3PL provider should be as detailed as possible. However, it is reasonable to believe that the extent and the context of the outsourcing decision affect the degree of detail that the outsourcing process should have. In the case of interviewee F, where the outsourcing decision comprised the central warehouse for the company's European market, a large quantity of 3PL providers were first looked into and the strongest candidates of these received a thoroughly designed RFQ. Moreover, the final selection in this case included weighting matrices to reach the best decision. Regarding the selection process for the company that interviewee A represents, which also comprised the European distribution, extensive preparations were made in this case, and a detailed RFQ were sent out as well. In contrast, interviewee B's company's outsourcing decision did only contain the Swedish national warehouse and it therefore seems reasonable that the selection process for this outsourcing decision was less comprehensive. The reason for this is probably that depending on the financial

impact and the potential risk that the decision has on the company, more resources will need to be spent on the preparations. The outsourcing of interviewee B's warehouse was considered not to carry high risks, which probably also affected the amount of resources put into the outsourcing process. Of the same reason, it is reasonable to believe that the financial impact and the potential risk of the outsourcing decision are influencing the commitment from the top management in the selection process. Therefore, companies that view their logistics function as a competitive advantage, which may be lost if outsourced to the wrong 3PL providers, should spend more time in the selection process. This goes hand in hand with that companies that view logistics as a competitive advantage also have the knowledge to conduct a proper review of potential 3PL providers on the market. To sum up the above mentioned arguments, the effort that is put into the outsourcing process should be higher if the outsourced activities have high risks and large financial impact. Furthermore, if the company sees logistics as a competitive advantage, it becomes more crucial that the top management is committed in the outsourcing process.

6.4.2 Number of suppliers

The company that interviewee A represents outsourced almost their entire European distribution to one single 3PL provider on the grounds that they more easily could conduct improvements and implement a standardized way of working. However, the company that interviewee B represents, had separate suppliers for transportation and warehousing, due to that these 3PL providers had different core businesses. There seems to be two arguments that can be drawn from these experiences. Firstly, interviewee A's company did not see logistics as their core competence, but still saw it as a crucial function for their company. Their solution was therefore to build a relationship with a supplier that could conduct these activities for them. Interviewee B's company considered themselves to have the required knowledge to be the linking part between the different 3PL providers and therefore chose to work with different suppliers that had different logistics activities as their core competence. Secondly, the choice of working together with one or more suppliers seems to be closely connected to TCE and the RBV, which were introduced in the theoretical framework by Rajesh *et al.* (2013) and de Grahl (2011). Interviewee A's company saw their outsourcing decision as a long-term decision and therefore wanted to work closely with one supplier to improve the long-term performance and to decrease the cost of transactions. However, interviewee B's company saw an advantage with having two separate suppliers that had different resources that they could take advantage of, more in line with the RBV. It would have been interesting to know if interviewee B's company would have used the same strategy if they had more logistics activities to outsource and thereby outsourced all these to separate 3PL providers. As mention by interviewee G, when using many different 3PL providers for the distribution it becomes hard to coordinate the work. This is advocated by TCE, where the transaction costs increases with the number of suppliers. Therefore, to summarize, if logistics is seen as a competitive advantage it is better to create as few 3PL relationships as possible to simplify coordination and receive better transparency.

Another aspect to consider is if the outsourced activities should be treated separately or outsourced as combined services. For example, if a company is to outsource transportation and

warehousing activities, should these activities be negotiated separately or treated as combined services? As interviewee A argues, whose company had to a large extent outsourced both warehousing and transportation to the same 3PL provider, it is possible for the 3PL provider to gain economies of scope by providing multiple services. If the 3PL provider have different customers in one of their warehouses and supply the same customers with transportation services as well, they can more easily consolidate the goods from their customers that should be transported to the same region. In this way they can achieve a higher fill rate in the freight carrier without having to consolidate the goods at a terminal. This, in turn, result in more efficient transportation. There are two aspects that go against this argument, though. Firstly, as interviewee C states, many 3PL providers have separated divisions for, for example, warehousing and transportation. Hence, the advantage is greater if these divisions are closely coordinated. Secondly, it is not certain that the best 3PL provider for the warehousing activities is the best provider to ship the specific goods. This was the case for interviewee B's company, who outsourced their warehousing activities to a 3PL provider that did not have parcel deliveries as their core competence, which was interviewee B's company's main type of goods. Therefore, they outsourced the transportation to a company that did this much better. However, another argument that motivates using the same 3PL provider for more than one service is that it provides more leverage in negotiations due to higher total volumes to be outsourced to one supplier. So, in total, it seems to be an advantages to use the same 3PL provider for more than one service if the 3PL provider have good coordination between their divisions and that they are market leading in all these services. However, companies that considers themselves to have good logistics knowledge have the option of being the actor that interlinks the different 3PL providers in their distribution as an alternative to create a single supplier relationship. The main argument from this section is summarized in Table 6.6.

6.4.3 Selection criteria

From the interviews it seems that a company's context affects the drivers that the company has for outsourcing logistics. For the companies that did not consider logistics as a competitive advantage, the main driver to outsource was cost reduction. Moreover, for companies that were growing and needed capital to make investments, the main driver was to free up tied up capital. This was, for example, one of the main drivers for interviewee A's company to outsource their distribution. Moreover, these drivers appear to affect the selection criteria when searching for a 3PL provider that will contribute to a successful relationship. Interviewee B's company had cost as the most important driver and also as the far most important criteria when selecting which 3PL provider to work with. One reason for this was probably that the logistics function was not seen as a competitive advantage in this company, even though the interviewee considered this. The interviewee, who is the warehouse and transportation manager for the company, seemed to have a different view regarding the significance of the logistics function in the company, where the top management instead wanted to invest money in something else. Interviewee A's company did not consider logistics as a competitive advantage either, and therefore would not want to possess the knowledge and infrastructure for managing the distribution. However, the company also prioritized the service offerings of the 3PL providers and their investment in a long-term

relationship together with the company. Eventually, interviewee A's company was more successful when implementing a 3PL relationship than interviewee B's company. It is reasonable to believe that the difference in level of detail when creating the selection criteria was a major cause of this. Therefore, to sum up this discussion, the drivers to outsource logistics seem to affect the selection criteria when choosing 3PL provider. However, the selection criteria should not only be based on the company's main drivers, which tend to come from short-term goals, such as cost reductions for short-term gains. Instead the criteria should be supplemented with other aspects to create a successful relationship in the long run. Furthermore, to know what criterion to include in the selection process it is crucial to possess an overall logistics knowledge and specific knowledge of the company's distribution. The main argument from this section is summarized in Table 6.6.

Table 6.6 Summary of main aspect to consider in the outsourcing process

Aspect	Comments
Effort put in the outsourcing process	Higher if the risk and financial impact is high.
Top management commitment in the outsourcing process	Higher if logistics is viewed as competitive advantage.
Number of 3PL relationships	As few 3PL relationships as possible if logistics viewed as competitive advantage.
Number of activities per 3PL provider	Advantage to use the same 3PL provider for more than one service provided that the 3PL provider have good coordination between their divisions and that they are market leading in all outsourced services. However, if good logistics knowledge, companies could work as an actor that interlink more 3PL providers.
Selection of criteria	Not only based on main drivers, but should be supplemented by aspect affecting long-term performance.

6.5 Managing 3PL relationships (phase five)

This section will first analyze the length and detail of the contract for a 3PL agreement, and then the management of the ongoing 3PL relationship. The objective is to make the outsourcing outcome as successful as possible, as illustrated in Figure 6.9.

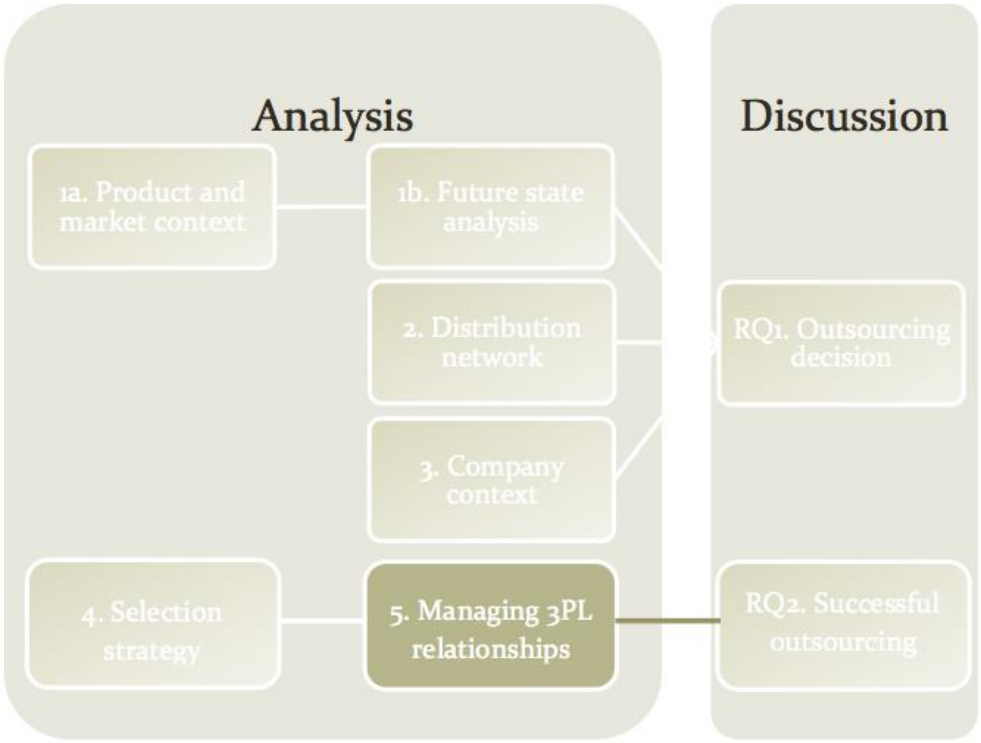


Figure 6.9 Phase five in the analytical framework.

6.5.1 Level of detail and length of contracts

From the interviews it was found that the standard length of 3PL contracts is somewhere between three to five years. However, interviewee A's company had a six year contract with the 3PL provider that took care of the largest share of their distribution. The company also had shorter contracts with the 3PL providers that were smaller suppliers to them. The reason for interviewee A's company to have longer contracts with the 3PL provider that have the largest share of the company's distribution was that they wanted time to implement improvements. The 3PL provider would then obtain sufficient time to develop non-standardized distribution activities for the company. Further, since interviewee C mentioned that short contracts is a limitation for 3PL providers, it results in that they cannot make long-term investments in efficiency improvements. It is reasonable to believe that the choice of using shorter contracts with the smaller 3PL providers was due to that interviewee A's company did not want to devote themselves to these suppliers and instead have the possibility to renegotiate the contracts more frequently. This strategy could therefore be a good choice for 3PL contracts representing small parts of a company's distribution volumes, where improvements are not contributing much to the company's final result. Moreover, for distribution activities that are characterized with low complexity, and where there

are a wide range of 3PL providers that can perform these activities, the contracts could be kept shorter to drive down costs through competition.

Another aspect to consider is the level of detail of the contract. No information about that was obtained from the interviews, but some arguments can be drawn based on the theory. In general, when outsourcing logistics it is hard to specify the contract in detail. Therefore some flexibility should be built into them instead. However, as discussed above, shorter contracts is more commonly based on less complex activities and can therefore be more detailed. If a company outsource a large part of their distribution to one 3PL provider, it will be harder to make detailed contracts, though. If the contract is long-term, there are more uncertainties regarding, for example, volumes and the scope of outsourcing. These conditions make it more difficult to predict the future and it is therefore a risk that detailed specifications in the contract are incorrect and will limit the relationship. Therefore, it is better to build in some flexibility into these contracts to make room for changes during the time span of the contract. The result from this discussion is that companies should use shorter and detailed contracts for smaller, less complex outsourced activities and longer contracts with built-in flexibility for more crucial activities with high financial impact.

6.5.2 Relationship involvement and trust

An important aspect that the outsourcing company has to take into consideration is the level of involvement in the outsourcing relationship. As interviewee B argues, either the outsourcing company just let the 3PL provider do their job, or get really involved in the relationship. The first option, to let the 3PL provider do the job as they please, is probably only an option if the outsourcing company does not see logistics as a competitive advantage at all and if the cost for logistics is not seen as vital for the company. In those cases, it might be better to interfere with the 3PL provider as little as possible since it will lower transaction costs and direct focus to the company's core business. However, if the outsourcing company sees logistics as a competitive advantage or as a driver of cost, it is probably better to have a close relationship with the 3PL provider. That means to share as much information and knowledge between the two parties as possible, and to work together to come up with improvements suggestions. For this to be possible, communication is vital. For example, interviewee A's company had an active communication with the 3PL provider all the way up to the top management of both companies. It should be noted, though, that interviewee A's company was a big customer to their 3PL provider, which means that the 3PL provider was also keen on keeping them as a customer. This results in that the 3PL provider was inclined to make the relationship work as good as possible, and to invest time and money into it. Interviewee B's company, that only had standardized meetings, was a much smaller customer to their 3PL provider. This resulted in that the company was disappointed with the 3PL provider's involvement regarding improvement suggestions. It was even so that the company themselves provided most of the improvement suggestions.

The number of 3PL providers that is used affects the level of involvement as well. This is due to that if many suppliers are used, high involvement will result in too high transaction costs. The level of involvement also affects the evaluation of the 3PL provider. If the level of involvement is

low, the need for evaluation becomes smaller since low level of involvement relationships were characterized above by low financial impact and companies that does not see logistics as a competitive advantage. It is still necessary to have some evaluation of the 3PL provider, though, to make sure that the provider performs according to the contract. If the level of involvement is higher, more frequent evaluation of the most important KPIs is necessary. For example, interviewee E's company have monthly KPI measurements and large supplier evaluations every year. However, as interviewee F argues, the outsourcing company needs to be quite knowledgeable within logistics to firstly be able to make these evaluations, and secondly to draw some conclusions from them to be able to come up with suggestions that will improve the KPIs.

For high involvement relationships to not result in high transaction costs, due to increased monitoring of the supplier, trust is needed between the two actors in the relationship. For example, interviewee A, representing a company that work closely with one major 3PL provider, mentioned trust as one of the main prerequisites for a successful relationship. Moreover, it was found that contracts that are written in a 3PL relationship where the uncertainty into the future is high should be less detailed and include flexibility. In these relationships trust becomes even more important, since the two parties will need to take decisions that are not stated in the contract. Interviewee E mentioned transparency and honesty as key factors for successful relationships. The reason that these were seen as important is probably since they are prerequisites for trust. Moreover, an open dialog between the two parties was also mentioned from the interviews as success factors for 3PL relationships and as prerequisites for a trustful partnership. The greatest benefits of trust, except reduced transaction costs, are probably that the actors want to share benefits with each other with the precondition that it will result in other benefits in the future. However, trust need to be based on interdependency, where both companies can consider making sacrifices in the short-term with the promise of gaining benefits in the long-term. It is also important that the two companies have aligned goals. For example, if a company wants to work with long-term improvement with one single 3PL provider, this supplier will need to have the same vision or otherwise it is likely that the interdependency will change with time.

To summarize the above mentioned arguments (see Table 6.7), the outsourcing company should have a high level of involvement in the 3PL provider relationship if logistics is seen as a competitive advantages and/or as an important driver of cost. However, if the outsourcing company uses many 3PL providers, the level of involvement has to decrease due to too high transaction costs. Moreover, if the level of involvement is high, more frequent and comprehensive supplier evaluations should be done. To be able to do that, logistics knowledge have to be retained within the company. For high involvement relationships to not result in high transaction costs, as a consequence of close monitoring of the supplier, trust is needed between the parties. However, trust is not enough but interdependency and aligned goals are also needed to make sure that the relationship will be successful also in the future.

Table 6.7 Summary of the main arguments from phase five.

Aspect	Comment
Length of the contract	Longer for important activities with high financial impact.
Level of detail of the contract	Less detailed for important activities with high financial impact.
Level of involvement	High for important activities with high financial impact.
Supplier evaluation	More frequent and more comprehensive for important activities with high financial impact.
Trust	Important when the level of involvement is high, to reduce transaction costs. Needs to be supplemented by interdependency and aligned goals.
Prerequisites for trust	Honesty, transparency and open dialog.

7. Discussion

This chapter will discuss the two research question presented in section 1.4.

7.1 Outsourcing decision

This section will discuss research question one, i.e. if the case company should outsource their European distribution to 3PL provider(s). The section is divided into how the distribution network and the company context affect the decision.

7.1.1 Distribution network

In the analysis (6.1.2.1) a future state model of the distribution network was developed with the requirement that customers should receive their products within 24 hours. The result that came out from this analysis was that five warehouses will be needed to respond to this lead time requirement. In section 6.2 it was argued that a 3PL provider is more attractive if a company has many small warehouses than if the opposite is true. This is supported by the theoretical framework, where it was mentioned that a 3PL provider can achieve economies of scale and scope due to that they combine product volumes from all the customers that they provide services for (Andersson, 1998; Azzi *et al.*, 2010; Deepen, 2007). Furthermore, it was also mentioned that a 3PL provider can even out demand variations between the different customers and thereby achieve high resource utilization. Therefore, to determine the attractiveness of a 3PL provider in this respect for the case company, one must decide if the case company can achieve sufficient economies of scale through all the five warehouses by themselves. The case company is a fairly large company that has customers in the mayor part of Europe. In particular, as was shown in section 6.1.2.1, the intended warehouse in Brussels will supply customers in the whole middle Europe, resulting in large material flows through this warehouse. However, the material flows through the other warehouses are probably not large enough to achieve sufficient economies of scale to be able to reach the same efficiency as a 3PL provider. Therefore, only considering this argument, the case company would probably benefit from outsourcing their distribution to a 3PL provider.

As argued in the future scenario analysis (section 6.1.2.3), if the lead time requirement is changed to 48 hours the amount of warehouses could be reduced to two. This would, using the reasoning above, reduce the attractiveness of a 3PL provider, since the case company could achieve economies of scale through both these warehouses themselves. The location of these two warehouses will also have to be determined if the outbound distribution is kept in-house, since the model in section 6.1.2.3 is a 3PL provider solution. An option would be to maintain, and probably expand, the current warehouse located in connection to the production plant in Sweden and build a new warehouse somewhere in middle Europe. The new warehouse should be located to minimize the transportation cost. Another option would be to evaluate if any of the case company's current warehouses that is located in middle Europe could be used in the future as well. However, the capacity in this warehouse would probably need to be expanded.

In section 6.2 it was argued that if a company has high distribution costs as a percentage of

revenue, the company should consider outsourcing the activities. The case company's current distribution costs of 4,2% of revenue does not seem to be that high and could be reduced further with an in-house solution based on fewer warehouses than the company's current distribution network. This number have, however, not been benchmarked in this thesis against similar companies. From section 6.1.2.2 the cost for the case company's future distribution network was estimated by a 3PL provider to be 1% of turnover, excluding transportation, if that provider would be operating it in their existing network. The case company's current distribution cost excluding transportation is about 2,1% of turnover, so even if the company would decrease this number further by a more efficient in-house solution, the 3PL alternative seems to be the most cost efficient. It should be noted, though, that the cost estimation by the 3PL provider is based on an assumed need of pallet racks in the warehouses. The number of needed racks was calculated by adding the safety stock with the order quantity, rounded up to whole pallets, to give a theoretical maximal storage need. In reality the need for pallet racks might be higher, since replenishment orders could be higher than the standard order quantity and occur before the inventory level reaches the safety limit. Moreover, the cost for repackaging, labeling and packaging material is not included in the cost calculation. However, if the need for pallet racks would be double of what was assumed in the cost estimation, the cost would still just be 1,2% of turnover. Moreover, since the 3PL provider probably has an advanced warehouse management system (Burnson, 2012), they would be able to maximize the utilization of pallet racks in the warehouse. The 3PL provider further states that value adding activities normally stands for 10-15% of the total cost for their customers. So, it is not likely that the total cost for the distribution would be higher than 1,3% if the 3PL solution is used. Hence, a 3PL solution seems to have the potential to cut warehousing costs substantially. The theory states that cost reduction is one of the most common drivers to outsource logistics (Mello *et al.*, 2008; Andersson, 1998; Diabat *et al.*, 2103), and this is also true for the case company. Therefore the cost estimation is an indication of that the case company should consider outsourcing their distribution to be able to decrease costs.

The case company has some extra activities that need to be performed in their warehouses. These are, as described in chapter four, repackaging and extra labeling. According to the theory, a 3PL provider can nowadays provide almost any type of service, or as Daim *et al.* (2011) states; "*at a price, anything could be outsourced*". Therefore it is reasonable to believe that a 3PL provider will have no problem to provide these services, especially since they are quite standardized. However, the argument from 6.2 was that a 3PL provider will have a hard time performing value adding and customer specific services at a lower cost than the shipper since the 3PL provider will not be able to do these activities for more than one customer, and therefore will not be able to achieve economies of scale. It is possible, though, that the 3PL provider can achieve economies of scale for the case company's repackaging and labeling activities since these are quite standardized activities that could be combined with other customers' services. However, the cost reduction would probably be small and when the 3PL provider's margin is added the cost for the case company would be about the same as if they performed the activities in-house. So, these activities seem to be neither an advantage nor a disadvantage if the case company would outsource distribution to a 3PL provider.

7.1.2 Company context

In section 6.3 it was argued that if a company sees logistics as a competitive advantage, outsourcing should only be considered if the 3PL provider can show that they can keep, or preferably improve, the logistics service performance. The case company does not see logistics as their main competitive advantage, but as a function that should perform as it currently does to the lowest possible cost. However, it is crucial for the case company to keep the service performance since backorders result in both losses of customers and penalty fees. Moreover, the case company has better logistics performance than their main competitors today, which gives them an advantage. Therefore, logistics performance is seen as a small competitive advantages relative competitors for the case company and it is then important that a possible future 3PL provider manage to keep, or preferable improve, the current logistics performance.

The outsourcing matrix from van Weele (2010), see Figure 2.4, can be used in an early stage to decide if a company should outsource a specific activity. The discussion above gives an indication of where the case company should be located on the horizontal axis in the matrix when it comes to logistics outsourcing. The horizontal axis states how important the activity is strategically for a company. The case company should be placed just right of center, since distribution in this case is not seen as the main competitive advantage for the company, but it is still crucial that the logistics performance is maintained. On the vertical axis, which represents a company's level of competitiveness relative suppliers, the case company should be placed just under the center line. This is due to that the case company have quite a lot of logistics knowledge, but are still seen as less competitive in logistics relative a 3PL provider that have logistics as a core competence. The case company is then located in the lower right square, see Figure 7.1. This indicates that the company should outsource the activities, but keep control over the performance by implementing a partnership.

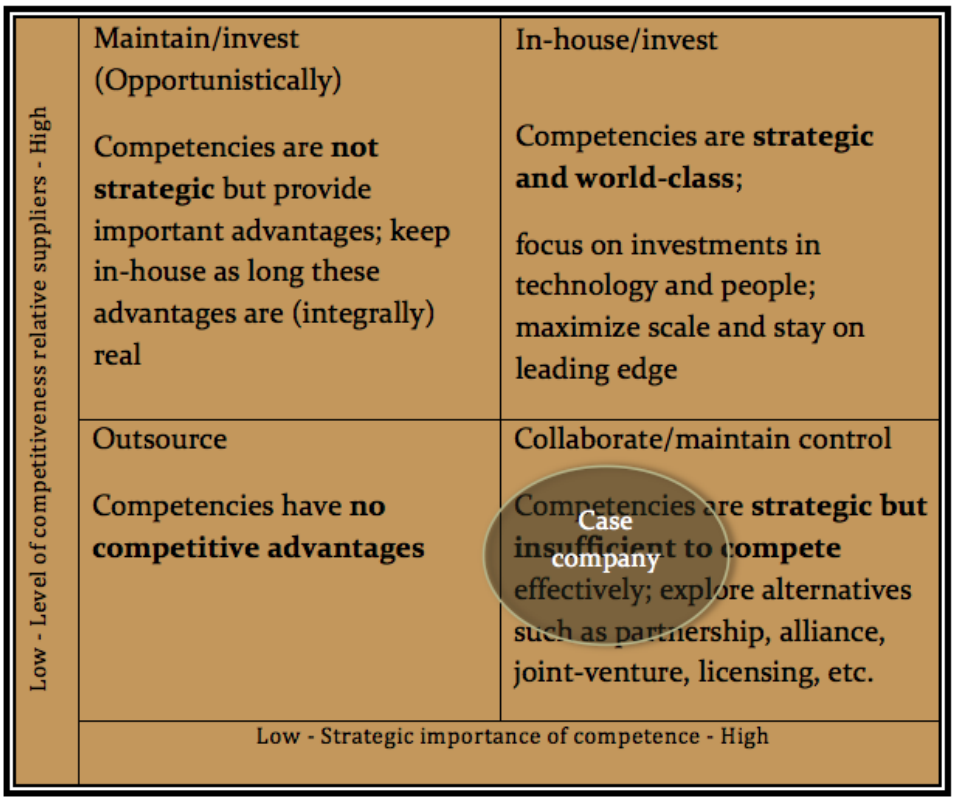


Figure 7.1 Case company's location on the outsourcing matrix. Source: van Weele (2010)

In section 6.3 it was argued that only operative knowledge is lost when logistics is outsourced. However, this knowledge was found to be quite easy to regain if a company decides to insource again. This gives a slightly different view than the one that was introduced in the theoretical framework, where, for example, Azzi *et al.* (2010) and Srabotizc & Ruzzier (2012) stated that lost logistics knowledge was seen as the most commonly stated risk of logistics outsourcing. Moreover, lost logistics knowledge was seen as a greater problem than what was found from the company interviews carried out in this thesis. For example, Onge (2002) mentioned that it might be harder to keep up with available improvement technologies if the logistics knowledge is lost within a company and Deepen (2007) stated the problem of performing proper evaluations of the 3PL provider if a company does not possess sufficient logistics knowledge. Regarding the logistics knowledge in the case company, it seems as they have accumulated quite a lot of it. Since they currently have good knowledge in areas concerning warehouse management, such as ABC calculations, this knowledge will probably be lost if the decision to outsource the distribution is taken. However, despite the fact that these types of activities are more of a tactical nature, they are quite well-known and it would probably not be hard to regain this type of knowledge. Another crucial aspect that the case company must take into consideration is the fact that logistics personnel will need to be laid off. The issue of firing personnel was argued by Mello *et al.* (2008) to be a driver not to outsource functions in a company. Since the case company has not been forced to lay off large numbers of employees before, this matter was mentioned to be a very sensitive issue and therefore the decision to outsource need to be well motivated. Thus, lost

logistics knowledge is not seen as a reason against logistics outsourcing for the case company. However, the outsourcing decision needs to be very well motivated since personnel will need to be laid off.

The attractiveness of a 3PL provider was argued in section 6.3 to be higher if a company is growing fast and unpredictable. The reason behind this argument is that the 3PL provider can even out demand variations between different customers in their warehouses, which are common when companies grow fast and unpredictable. Rapid growth was further mentioned by Mello *et al.* (2008) and Rajesha *et al.* (2013) as a commonly cited driver to outsource logistics. The case company stated that they are growing in a quite slow and stable rate at the moment. However, they also stated that they want to grow by acquisitions, which might result in incremental changes in product volumes in the different warehouses in the future. Therefore, as long as the case company is growing quite slow and stable, the changes in volumes will probably be quite easy to predict and the attractiveness of a 3PL provider in this situation will be low. However, if acquisitions is planned to be made, the volumes will probably change incrementally and outsourcing will be seen as a more attractive choice. This is also the opinion of Burnson (2012) who states that an advantage with a 3PL provider is that they can react quickly to changes. Therefore, to be sure that acquisitions will not lead to logistics problems, logistics outsourcing is a good option.

Another reason to outsource logistics that was analyzed in section 6.3, and also described in the theory, was to be able to switch fixed into variable costs. As Andersson (1998) argues, the risk of owning logistics assets is also transferred to the 3PL provider when logistics is outsourced. The case company does not state that they want to switch fixed into variable costs, but it is still an advantage of logistics outsourcing. However, since the case company's sales volumes are quite stable this advantage is not decisive for the outsourcing decision. The case company did state that they want to reduce tied up capital. Capital tied up in owned warehouses will be reduced when outsourcing logistics, but this could also be done, as stated in section 6.3, by renting warehouses instead of owning them. Another issue for the case company to consider if they would outsource logistics is that they would have to find new offices for their local sales personnel, which is currently located in the same facilities as their local warehouses. Finding new offices will probably be easy to find, though. All in all, the above arguments are not considered to affect the outsourcing decision to a large extent.

7.2 Successful outsourcing

This section will discuss research question two, i.e. how the case company can make a 3PL arrangement as successful as possible. The section is divided into how the selection strategy and the management of the 3PL relationship affect the outcome of an outsourcing arrangement.

7.2.1 Selection strategy

In section 6.4 it was argued that more effort should be put into the outsourcing process if the outsourcing decision is characterized by high risk and/or high financial impact. Since the case company's outsourcing decision will affect the design of the company's European distribution, the

financial impact in this case is significant. Moreover, the risk of losing the current service level, which is seen as a competitive advantage, should have an impact on the effort that has to be put into the outsourcing process. Due to that the theory further emphasizes the importance of performing a comprehensive outsourcing process and since lack of a proper selection process is commonly a reason for failed partnerships (Sahay & Mohan, 2006), the case company is advised to put much effort into this important phase. However, more effort put into the outsourcing process result in increased transaction costs, since both time and money will be needed throughout the search and contracting process (Deepen, 2007). Nevertheless, this is considered to be financially viable for the case company, due to the extensiveness of the outsourcing decision. Another important aspect that was argued in the analysis was the importance of top management commitment in the outsourcing process. From the analysis it was found that the top management should be more committed into the outsourcing process if the logistics function is viewed as a competitive advantage within the company. However, Sahay & Mohan (2008) described the outsourcing process, with the selection of supplier as the most crucial decision, as a strategic concern that the top management always should be part of. To summarize the above mentioned arguments, the logistics performance is viewed as a small competitive advantage for the case company. Moreover, as discussed earlier, since the financial impact of the outsourcing decision is high the outsourcing process will be a strategic concern, which the case company's top management therefore should be part of.

Other key decisions in the outsourcing process, which was analyzed in section 6.4, are the number of 3PL relationships that an outsourcing company should manage and the number of activities that each 3PL provider should perform. Firstly, it was found that fewer 3PL relationships should be managed if logistics is viewed as a competitive advantage. However, if a company has good knowledge in the logistics field, the company can work as an actor that interlinks more than one 3PL provider. As described above, the logistics function is viewed as a small competitive advantage within the case company, where it is important that the current logistics performance is maintained. Therefore, it is an option for the case company to handle more than one 3PL relationship for their distribution network. This is due to that the company possesses great logistics knowledge and can therefore work as the actor that interlinks different suppliers, similar to the role that interviewee B's company had. As argued in the section 6.4, the amount of 3PL providers are closely connected to the theories of TCE and the RBV, introduced by Rajesh e*t al.* (2013) and de Grahl (2011) in the theoretical framework. In the analysis it was argued that working with many 3PL providers allows companies to take advantage of these companies' resources. However, to make it possible to take advantage of these resources a close relationship will probably be needed between the parties. Therefore, working with many 3PL providers will increase the transaction costs too much to be financially viable, since a close relationship requires a lot of time and effort. The number of outsourced activities per 3PL provider was also analyzed in section 6.4. It was found that it is an advantage to use the same 3PL provider for more than one service, provided that the 3PL provider have good coordination between their divisions and that they are market leading in all outsourced services. This results in that the 3PL provider can achieve economies of scale and synergies between the activities, which could not have been

achieved if different suppliers performed the activities. However, if a company cannot benefit anything by using the same 3PL provider for more than one activity it is probably best to use the 3PL provider that perform best for each outsourced activity. Therefore, the case company, that are to outsource transportation and warehousing activities, do not have to outsource these activities to the same 3PL provider, but to the provider that performs each activity in the best and most cost efficient way. However, as describe earlier, as few 3PL relationship as possible should probably be used for each activity to keep the transaction costs low.

In section 6.4 it was argued that the criteria that is used to evaluate possible future 3PL providers should be based on the main drivers a company has to outsource. However, it was also argued that these should not be the only criteria, but it should be supplemented with criteria that enable long-term success. The main driver for the case company to outsource distribution is to be able to cut costs. Therefore one obvious driver in the selection process is cost. McGinnis *et al.* (1995) argues that criteria should be chosen with a case-by-case approach. For the case company, another important aspect in the outsourcing process, apart from cost, is that their current logistics performance should be maintained. Therefore, another criterion that should be used is what Weiskott (1999) calls "*the current performance of the supplier*". The author gives other examples of criteria that could be used by the case company to be able to develop a long-term relationship that are able to continuously develop. These are "*the knowledge and expertise of the supplier*" and "*the financial stability of the supplier*". The knowledge and expertise of the supplier is, however, quite hard to quantify. This will still have to be done if the case company should use the AHP method described in section 2.3.2, which seems to be a good method to be able to choose the right supplier.

7.2.2 Relationship management

In section 6.5 it was argued that the length of the contract for a 3PL relationship should be long if the outsourced activities have high impact on a company's financial result. Regarding the case company, the financial impact is considered as high since they are considering outsourcing their entire European distribution, as discussed above. Therefore, they should use long contracts for potential 3PL relationships. As discussed in the previous section, the case company should use few suppliers. Long contracts will in that case facilitate a partnership since short contract can constrain a relationship. For example, as interviewee C argued, it is very difficult to make investments into a relationship that have a contract length of three years. Furthermore, the level of detail of the contract should be lower if the financial impact is high. This is also in line with the opinion of Selviaridis & Spring (2010) who mentioned that it is too difficult to make detailed specifications in a 3PL contract, and that some flexibility should be built into them instead. Moreover, Gadde & Hulthén (2009) and de Grahl (2011) argued that a detailed contract will constrain the relationship. Hence, for the case company to build long term success in a logistics outsourcing relationship that should continuously improve, contracts should be both long and have a built-in flexibility.

In section 6.5 it was also argued that if the outsourced activities have high financial impact, the level of involvement in the 3PL relationship should be high. Therefore, the case company should be highly involved in their 3PL relationships. This also goes hand in hand with the discussion about contracts above and the positioning of the case company in van Weele's matrix, which indicates a partnership. Since the contracts should be long and have some built-in flexibility, it is important for the case company to be highly involved in the relationship to be able to create a long-term successful partnership. The need for partnerships in logistics outsourcing was stressed in the theoretical framework by many authors, such as Andersson (1998). To be highly involved in a relationship means to share information and knowledge to the other party. As Gadde & Hulthén (2009) argued, it is important for both the shipper and the 3PL provider to share information and knowledge that the other party might find useful. However, to be able to use contracts that have built-in flexibility and to share information and knowledge, trust is required in the relationship. Trust does not only reduce transaction costs (Deepen, 2007), but also make it easier for both parties to share information and knowledge since it is known that the other party will use it for the benefit of both. From section 6.5 it was argued that prerequisites for trust are honesty, transparency and an open dialog. Apart from these, Deepen's model in Figure 2.3 argued that communication and shared values are important to build trust.

8. Conclusion

This chapter will answer the purpose of this thesis and also give the case company a recommendation about how to proceed. Moreover, limitations of this thesis and suggestions for future research will be discussed.

8.1 Conclusion and recommendation

From the discussion (section 7.1), arguments regarding if the case company should outsource their European distribution was developed. First of all, the company's distribution network consists of quite many small warehouses, which increases the attractiveness of a 3PL provider due to their ability to combine volumes from different customers. Second, the locations of the company in van Weele's outsourcing matrix argued that the company should outsource the activities by implementing some kind of partnership. Moreover, no major risks with logistics outsourcing were found that would have a long-term impact on the case company. Logistics outsourcing was also seen as a good way to reduce the risk of potential acquisitions creating logistical problems. Lastly, the cost estimation of a future 3PL alternative showed that the cost for a 3PL provider operated distribution network, excluding transportation, will probably not exceed 1,3% of revenue, and will most likely be less than that. Compared to the company's current costs of 2,1% of revenue this is a large difference. Even though an in-house solution could reduce the company's costs from their current level, a 3PL alternative has the largest potential to reduce costs. Due to the arguments above, the company is recommended to consider outsourcing their European distribution to a 3PL provider. However, if the company loosens the requirement of a 24 hour lead-time to customers the needed number of warehouses would be lower, and an in-house solution would be able to compete with a 3PL alternative. For this to be a good option, the country specific article number should also be abandoned to be able to take advantage of the inventory reduction from the centralization.

For the company to create a successful outsourcing agreement, it was argued in the discussion (section 7.2) that much effort needs to be put into the outsourcing process. The main reasons for this were that the outsourcing agreement will have high financial impact, due to that the agreement comprises the company's whole European distribution, and that there is a risk of losing the current service level. Moreover, of the same reasoning, the outsourcing process was found out to be a strategic concern, which the top management within the company therefore should be part of. In section 7.2 it was further discussed that as few 3PL relationship as possible should be used per activity to keep the transaction costs low. However, it was revealed that the company should use the best 3PL provider for each activity, such as transportation and warehousing, provided that one supplier cannot offer the best performance for all these activities. This is due to that the case company has sufficient logistics knowledge to coordinate different 3PL providers. In order for the company to choose the right 3PL provider(s) for the outsourcing agreement, it has been argued throughout the whole thesis that criteria, such as cost and knowledge of the 3PL provider. These criteria should be developed to be able to put together a RFQ that will distinguish the 3PL provider that best matches the demands and goals of the

company. These criteria have further been discussed to be used when weighing the answers from the RFQs using methods such as the AHP method. From the discussion, it was found out that these criteria should not only be based on the company's main drivers to outsource logistics, such as cost reduction and current performance level of the 3PL provider, but be supplemented by criteria that enable long-term success. Therefore, to compile these criteria is a substantial part of the outsourcing process for the company.

From the discussion (section 7.2) it was revealed that the company should use long contracts for the outsourcing agreement. Moreover, these contracts should also contain some built-in flexibility to not constrain the relationship. Since the potential 3PL relationship will have high financial impact, it was found out that the company should be highly involved in the relationship and share information and knowledge to provide conditions for a successful collaboration. Moreover, to develop a partnership with the 3PL provider(s), which showed to be important in van Weele's outsourcing matrix, it is important to develop trust in the relationship.

The first step for the company if they decide to outsource distribution should be to create a detailed RFQ to send out to the larger 3PL providers in Europe. The answers from the RFQs should provide locations of warehouses, which should be located in the 3PL providers existing network. However, it is still recommended that the company keep their warehouse that is located in connection with the production site in Sweden, since this facility is used for other activities and would otherwise not be fully utilized. The answers from the RFQs should be compared against each other and an in-house solution using the AHP method with predefined criteria. During this stage, it is recommended that the company involve the employees in the decision, to make them positive about the outsourcing decision. This is important since employees will have to be laid off, which can create negative feelings about the outsourcing decision from the employees.

8.2 Limitations and future research

The thesis work has been limited in some means. Firstly, not enough empirical data have been found about similar companies that have outsourced distribution to 3PL providers. More information within this area would have strengthened the arguments, developed in the analysis, further. Moreover, the credibility of the thesis could have been substantiated if interviews would have been made with representatives from companies that have first-class in-house solutions within outbound distribution. In this way, the current solution of the case company could have been compared with those in order to get a sense of how cost efficient an in-house solution could be. The cost estimation that has been conducted within this thesis did not include the cost for transportation. Information regarding the cost for transportation would have provided a more complete decision support for the case company when considering outsourcing their outbound distribution. However, this information would probably not have changed the recommendations given in this thesis regarding the outsourcing decision. The credibility of the future state analysis could further have been strengthened if more than one 3PL provider had been used. It is reasonable to believe that the future state design of the case company's outbound distribution would have looked different if another 3PL provider had been asked to perform the lead time analysis as well, due to that different 3PL provider operates warehouses in different areas.

The method that has been used throughout this thesis is possible to apply on other companies. The step-by-step process used in the analysis, including the arguments developed in that chapter, is directly applicable to most companies that have physical distribution networks. However, the results will look very different depending on the context of the company.

The amount of previous research within outsourcing of logistics services to 3PL providers was huge. However, there was less previous research concerning outsourcing of logistics services related to specific industries. In particular, the amount of research concerning outsourcing of logistics services in the healthcare industry was small. Therefore, there is large potential for future research within this topic. Moreover, small amount of previous research was found regarding the long-term effects of logistics outsourcing. Thus, there is large potential for future research within this area as well.

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Appendix A - Questionnaire

1. Approximately, how many employees work at the company?
    a. 0-500
    b. 501-1000
    c. +1000

Answer:

2. Approximately, what are your lead times to customer?

Answer:

3. Where are your products shipped? (e.g. only nationally, within Europe or globally)?

Answer:

4. What motives do you have for considering using/not using a 3PL provider for your outbound distribution?

Answer:

5. What effects did you expect from the collaboration with the 3PL provider?

Answer:

The following questions target companies that currently using, or have previously used, 3PL providers for their outbound distribution.

6. What services does the 3PL provider perform for you?

Answer:

7. What were the direct effects from the collaboration (was it as expected or did unexpected effects occur)?

Answer:

8. How did the collaboration develop with time? (+3 years) and what were the long term effects?

Answer:

9. In what way and how often do you evaluate the performance of the 3PL provider?

Answer:

10. What do you consider to be the most important aspects for a 3PL relationship to be successful?

Answer:

11. Do you have any other views on the subject that could be important to know about?

Answer:

Appendix B – Indata for 3PL provider cost estimation

3PL Questionnaire

All volumes based on 12 month period

Inbound data		Fill in	Comment
Container			
	Number of orders		Number of purchase orders arriving in container
	Number of 20' cont. loose loaded		Number of 20' arriving loose loaded
	Number of 20' cont. with palletized gods		Number of 20' arriving with palletized gods
	Number of m3 arriving in 20' cont.		Number of m3 arriving in 20' container
	Number of 40' cont. loose loaded		Number of 40' arriving loose loaded
	Number of 40' cont. with palletized gods		Number of 40' arriving with palletized gods
	Number of m3 arriving in 40' cont.		Number of m3 arriving in 40' container
	Number of pallets arriving in container		Total number of pallets arriving in container
	Number of cartons arriving in container		Total number of cartons arriving in container
	Average weigth of cartons		If loose loaded
Truck			
	Number of orders		Number of purchase orders arriving with truck
	Number of trucks		Total number of trucks arriving
	Number of pallets		Number of pallets arriving with truck
	Number of m3		Number of m3 arriving with truck
	Number of cartons		If loose loaded
	Number of mixed pallets		If pallets have more then 1 SKU
	Number of SKU/mixpall		If pallets have more then 1 SKU
Other			
	Other information		

Storage data			
Rack storage			
	Number of pallets in rack storage		Total need of rack storage
	Pallet weigth		Average weigth
	Pallet heigth		Average heigth
Shelves			
	Number of shelves		Total need of shelve storage
	Shelve size		Size of shelve
	Number of cartons		Number of cartons stored in shelves
Floor storage			
	Number of m2		Total need of floor storage
Other			
	Number of SKU		Number of SKU:s in storage
	Additional production area		Number of m2 needed
	Other information		

Outbound data		
Unit picking		
Number of orders		Total number of orders picked as units
Number of order lines		Total number of lines picked as units
Number of units picked		Total number of units picked
Volume of pick units		Average volume per unit
Weigth of pick units		Average weight per unit
Full pallet picking		
Number of orders		Total number of orders picked as full pallets
Number of lines		Total number of lines picked as full pallets
Number of pallets		Full pallets picked in rack or floor storage
Shipments		
Number of pallets		Number of pallets to be shipped
Number of cartons		Number of cartons to be shipped
Other		
Other information		

Other information	
Is there seasonal variations?	
What are the cut off times?	
What kind of administration is needed?	