TPL Practices: A Swedish Perspective
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Abstract

Purpose – There is growing evidence of organizations increasingly seeking to outsource logistics activities. This has been concluded in several other countries. There has not been made any prior systematic studies made over the practice of TPL usage in Sweden. Since Sweden has a large amount of manufacturing companies, the purpose aims to examine and give a broad view of the usage of third party logistics (TPL) services for the manufacturing firms in Sweden. At the same time a comparison study will be made between Sweden and the other countries.

Design/Methodology/Approach – The empirical research is used to study the extent firms use the services of logistics companies; the decision making process for choosing contract logistics and its impact on the organization; The TPL services used and plans for the future in terms of the usage; TPL usage in a supply chain perspective.

Findings – The study indicates that Swedish manufacturing firms are quite experienced in the use of third party logistics services. The usage of TPL services reveals positive and significant impact on the business performance within the organization; most of the users are satisfied with the services providers. Additionally, the usage of TPL services is expected to increase in the future. In terms of the supply chain perspective, certain number of respondent in manufacturing companies are aware of and influenced by the usage of the TPL services providers from the supply chain partners.

Research limitations/implications – This survey focused on the largest, 350 manufacturing companies in Sweden. However, many small-medium size companies also use the TPL services, study can be done to compare the use of TPL services in terms of the size of the companies. Further, concerning the supply chain perspective, research can be done to investigate whether more benefits in sharing the same primary TPL providers with major customers and vendors than in using different TPL providers. Studies can further be done to identifying who has more power in the supply chain concerning the use of TPL providers, for the Swedish manufacturing companies.

Practical implications – The results provide managers with evidence supporting the benefits of outsourcing logistics activities. The study also contains useful information for the TPL providers concerning the most frequently used services and the potential services which are currently absent in the market.

Originality/value – This study makes a significant addition to literature on logistics outsourcing, since little empirical research has been previously reported from Sweden. Moreover, the results of this study will also serve as a future benchmark for the entire Nordic region.
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1 Introduction

The Purpose of this introductory chapter is to present the background that familiarizes the reader to the subject, provide a general overview and offer an outline of the study undertaken. The thesis' research problem is formulated and introduced, and the author continues by setting the purpose and delimitations in order to define the area of the study. Further, we give a description of the term third-party logistics and other terms that will be commonly used in the thesis.

1.1 Background

The conditions for doing business are under constant change. The key to success and survival in the market lies in the ability to adapt to the changing process. Factors like globalization, IT and customer demand has increased the difficulties and possibilities for the actors in the market (Mattson, 2002).

Today’s business success to a great extent depends on logistics and supply chain performance. More and more companies, especially manufacturing firms, obtain their competitive advantages through creating successful logistics outsourcing alliances to optimize value and performance (Liu & Cui, 2006). In order to handle its logistics activities efficiently and effectively, a company may consider several options such as; provide the function in-house by making the service, owning/buying logistics subsidiaries, or outsourcing the function and buy the service (Cox, 1999).

In the 1970s it was most common to do the logistics activities in-house, as for instance in most cases warehouses, truck fleets and terminals were owned by their users. In fact, a typical company managed everything from purchasing to delivery and post-sale service. In early 1980s the outsourcing of logistics activities started growing. This was due to competition in business, companies tried to squeeze all their costs down beginning with marketing, production, human resources and ultimately logistics. For this reason, the logistics activities outsourcing took place throughout the logistics network. Outsourcing of logistic activities has now become a central theme in supply chain management (SCM). Logistics is a part of supply chain processes which plans, implements, and controls the efficient and effective forward and reverse flow. It also includes storage of goods, services, and related information between the point of origin and point of consumption for the purpose to meet customer requirements (Berglund, 2000).

The Western Europe has gone through a significant change during the last two decades. The market of Eastern Europe opened up to the world when the Berlin wall fell and the Soviet Union was dissolved. There was an increase of well educated people, this opened up the possibility to bring down labor costs. At this time few Western European companies outsourced production to other countries (Gustafson & Trygg, 2005). However, this has changed and was influenced due to the European Union. The EU is under constant change, and year 2004 new Eastern countries became members. Bengtsson, Berggren & Lind (2005) mean that this later market expansion in EU leads to further outsourcing in Europe.

In the past decade, the role of manufacturing has shifted from a producer of goods and services to one that co-ordinates the whole industry value chain. The logistics outsourcing from manufacturing firms is a transaction-based economic action that manufacturing firms commits its all or part of logistics service to, this is done for the purpose of pooling the energy and resource to develop its own core business (Liu & Cui, 2006). Operations that
can be done better by others and in many cases cheaper can be bought externally. In this case it is important to be able to point out what a company’s core competence is (Mattson, 2002). As manufacturing industry is gradually moving towards a borderless business environment, new models for manufacturing cooperation and collaboration through networks to meet the imminent challenge in the increasingly competitive marketplace is on the horizon. The manufacturing industry is highly influenced by restriction in the market. Globalization, IT development, and an increase of competition from low labor countries together with increased pressure of profitability have together all contributed to a harder market climate. Decisions regarding what to keep in house and which operations to outsource have become central to discussion (Choy & Lee, 2003).

The outsourcing of logistics services is expected to increase (Langley, Allen & Dale, 2004), and will continue to evolve at least in Europe. According to Wallström (2007), the Swedish market for outsourcing has an annual growth rate of 24%, which is the highest growth in the world. A large part of business growth lies in the finance and telecom companies in Sweden. These businesses outsourced to low cost countries in 2006 accounted for 800 million Euros. This has been pointed out by a research done by Quarterly Index (Wallström, 2007). Finance accounts for 40 percent of the European outsourcing market, followed by telecom with 23 percent. Globally the value of new outsourcing contracts are going down with 17 percent compared to last year. This can be due to the regression of the USA market. Further, the manufacturing companies stand for the greatest part of the Swedish export (Bengtsson, Berggren & Lind, 2005).

1.2 Problem Definition

The recognition of the TPL services are not the same as the traditional logistics services oriented from single service providers. Different authors have carried out studies about third party logistics in Sweden. The aim of the study made by Stefansson (2004) is directed towards the role of third party service providers and the enabling information systems architecture through case studies. Stefansson (2005) and Gavrielatos (2006) have also addressed the management role of third-party logistics services providers. Issues about strategic positioning and strategies of the third party logistics providers are discussed by Berglund (2000) in his study. Further, the topic of Third Party Logistics has gained little attention from a holistic point of view. A great deal of successful research has been produced with this angle in other countries. These studies have been carried out in Australia (Dapiran, Lieb, Millen & Sohal, 1997), USA (Lieb & Randall 1996, 1999, 2000; Langley, Newton & Tyndall, 1999; Langley, Newton & Allen, 2000; Langley, Allen & Tyndall, 2001, 2002; Langley, Allen & Colombo, 2003; Langley, Allan & Dale, 2004; ), Western Europe (Lied, Millen & Van Wassenhove, 1993a), Singapore (Bhatnagar, Sohal & Millen, 1999), India (Sahay & Mahan, 2006) Saudi Arabia (Sohail & Al-Abdali, 2005) South Africa (Cilliers & Nagel, 1994), Korea (Kim, 1996), and Asia Pacific (Millen & Sohal, 1996). These countries have gained large benefits of TPL services over the last few years. However, the lack of such study specifically designed for Sweden provides us the interest to investigate in this area, thus it gives us the research problem of this thesis,

“How do manufacturing companies use TPL services in Sweden?”

However in order to answer the research problem, the following four questions will be further enlightened and looked into.
What criteria are important when choosing a TPL provider?

How are the decisions regarding TPL made in the organization?

To what extent do companies use the services of TPL companies?

What are the future plans of current TPL users?

These areas are of interest because they give light to different angels and facilitate to give a broad view of the usage of TPL services. The retrieved information can be used in comparison to other similar studies that have been conducted in other countries.

1.3 Purpose

The purpose of this research is, in buyers’ perspective, to identify and describe the use of TPL providers for Swedish manufacturing firms. At the same time, this study will be compared to those previous findings in other countries.

1.4 Delimitations

Considering the scope and potential that the present research topic offers, clear delimitations have to be set up in order to keep the research focused on a specific study outline. The main reason behind setting these delimitations is the limited timeframe.

This study only focuses on the third party logistics services from the buyers’ perspective. The research is delimited by scope by only focusing on manufacturing companies operating in the pre-mentioned geographical limits, Sweden. We have delimited the empirical span to the 350 largest companies.

The language used in the questionnaire has been limited to only English. Since, most of the logistical literature is written in English, we consider the translation from English to Swedish would be biased to the original content. We have realized the risk of linguistic problems of the respondents not being able to comprehend the questions. However, we consider, since almost all the respondents come from international companies, they shouldn’t be constrained by the English language.

The terms of “third party logistics” (TPL), “outsourcing logistics”, “contract logistics” and “external logistics” are used as synonyms through the whole thesis.

1.5 Central definitions of Third Party logistics

In order to understand the main task and studied topic thoroughly, a brief discussion about the basic terms used in the thesis will be presented below. The concepts will be defined and an appropriate definition will take out relevant to the use in this thesis.

1.5.1 Logistics

The origin of the logistics concept can be traced back to the 1960s. This was due to the military recognizing the importance of logistical activities for the national defense. Furthermore, there was an increased acknowledgment that can be dated to the Persian Gulf war in the beginning of the 1990s, when news commentators commonly mentioned the lo-
gistical challenges associated with the so called “7000 mile supply pipeline” to support the war troupes in the in the Persian Gulf countries (Pagonis, 1992). The business world was attracted by the practice used by the military and recognized the service quality an addition to product quality (Bardi, Coyle & Langley, 2003).

In the 1970s and 1980s, the business approach led to the development of logistics, it was divided into inbound logistics (materials management to support manufacturing or operations) and outbound logistics (physical distribution of finished goods to support marketing).

In the 1990s, the logistics was viewed in the context of a demand or supply chain which connected all the organizations from the customer’s customer to the vendors’ vendor. The importance of logistics has also been evidenced by failures associated with Internet retailers during the Christmas season of 1999. Similar failures, when being of out of stock in stores, would be blamed on the logistics systems (Bardi et al., 2003).

Today, logistics is viewed as part of management and has four sub-categories;

<table>
<thead>
<tr>
<th>Military Logistics</th>
<th>The integration and design of all parts of support for the operational capability of the military forces and equipment to ensure reliability, readiness and efficiency.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Logistics</td>
<td>One of the parts of the supply chain process which plans, implements and controls the flow and storage of goods, services and relevant information in the whole supply chain.</td>
</tr>
<tr>
<td>Event Logistics</td>
<td>The network activities, facilities, and personnel required to organize, schedule, and arrange the resources for an event to take place and to efficiently withdraw after the event.</td>
</tr>
<tr>
<td>Service Logistics</td>
<td>The scheduling, acquisition and management of the assets, personnel and materials to support and sustain a service operation or business.</td>
</tr>
</tbody>
</table>

Table 1-I: Four sub-categories of logistics management: (Bardi et al., 2003)

All the presented categories have common characteristics such as scheduling, forecasting and transportation; however they have some differences in terms of primary purpose. All of them can be viewed in a supply chain context, that is, downstream and upstream. In our thesis, our focus is upon logistics in the business sector.

Even though the usage of the term “logistics” has increased and there still exists confusion to what it really means, it may be due to the fact that there are a number of different terms related to logistics. We have chosen to use the standardized definition from the Council of Logistics Management, which is pointed out by Bardi et al., (2003, pp.681), it includes all four sub disciplines:

“Logistics is the process of planning, implementing, and controlling the efficient, effective flow and storage of goods, services, and related information from point of origin to point of consumption for the purpose of confirming to customer requirements. Activities include but are not limited to: warehousing, transportation, private fleet, inventory control, purchasing, production scheduling, customer service, and long range planning.”

The Council of Logistics Management definition is also in line with the European Logistics Associations which is referred by Berglund (1997):
"The organization, planning, control and execution of the goods flow from development and purchasing, through production and distribution, to the final customer in order to satisfy the requirements of the market at minimum cost and minimum capital use”

These definitions emphasize critical components of logistics, which are categorized as, physical flow, storage, information handling, management and coordination.

### 1.5.1.1 Third party logistics (TPL)

Even though TPL is a term that has become more and more commonly used, there is no standard, generally accepted definition of the term. In addition, there are also other synonyms used to describe the same phenomenon, for example 3PL, contract logistics and integrated service provider (Lieb, Miller & Wassenhove, 1993b; Bagchi & Virum, 1996). We will however not be limited to the use of these terms throughout this thesis. Since there are different definitions of TPL, we turn to other authors to see how they define the term. Breaking down the TPL term will help us with a description to what it means and furthermore identify some typical characteristics for TPL.

Initially, we start with the fact that TPL involves a separate organization who, without having any real part of the supply chain. Thus, TPL providers can be seen as supportive supply chain members. Lambert, Cooper & Pagh (1998) defines supportive members as:

"Companies that simply provide resources, knowledge, utilities or assets for the primary members of the supply chain”

The term TPL has its foundation in a triadic form of relationship. A TPL service provider steps in as a middleman between two participants, and as a result, becomes involved as a third party. The relationship referring to Berglund (2000) is demonstrated in figure 1-1. Firms utilizing TPL employ an outside company to perform some or all of the firm’s logistics activities that have been traditionally performed within an organization. The third-party providers will also be called first tier suppliers who have a first tier relationship with the primary participants, which are also called the owners of the goods. The second tier suppliers as demonstrated in the figure means the third party logistics provider’s suppliers, who have indirect relation to the primary participants.

The service activities performed by the third party logistics may be narrow in scope, for instance, limited to warehouse services; or broad, cover the entire supply chain (Lieb et al., 1993a; Bradley, 1994). According to this definition, third party logistics includes any form of externalization of logistics activities previously performed “in-house”.

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Secondly noticed is the high level of integration between the TPL provider and its customers and between the performed functions. Finally there is a common feature of TPL as being a long-term relationship, the customer and a provider encompassing the delivery of a wide range of logistics needs. In a logistical alliance the two parties regard each other as partners. Both partners take part in designing and developing logistics solutions and measuring performance. The primary goal is to achieve a win-win arrangement (Bagchi and Virum, 1996). This definition brings the strategic dimension of the concept and assumptions to light. Some characteristics, such as, containing a certain duration, joint efforts to develop further collaboration and a customization of solution, needs to be fulfilled before the relationship between user and supplier of logistics functions can be describes as TPL.

The Council of Logistics Management has come with the following definition for Third Party Logistics:

“Outsourcing all or much of a company’s logistics operations to a specialized company.”

(Bagchi and Virum, 1996)

This definition is however not complete without also quoting the definition of TPL provider:

“A firm which provides multiple logistics services for use by customers. Preferably, these services are integrated, or “bundled” together by the provider. These firms facilitate the movement of parts and materials from suppliers to manufacturers, and finished products from manufacturers to distributors and retailers. Among the services which they provide are transportation, warehousing, cross-docking, inventory management, packaging, and freight forwarding.”

(Bagchi and Virum, 1996)
The mentioned definition above applies the outsourcing concept of logistics functions. But there is something missing in this definition, as stated above the bundling of the services is preferred. However looking at a European definition something else is stated:

*Third-party logistics (3PL) are activities carried out by an external company on behalf of a shipper and consisting of at least the provision of management of multiple logistics services. These activities are offered in an integrated way, not on a stand-alone basis. The cooperation between the shipper and the external company is an intended continuous relationship.*

(ProTrans, 2001, p. 2)

This definition stresses that the TPL agreement includes activities which might be service management, and not only producing the services as such. This means that the third party must not actually produce services, but can be responsible for integrating and managing the producing party, i.e. lower tier providers. According to Berglund (1997), tiered execution of services is quite common among TPL providers.

The European definition has a clear statement regarding integration of multiple activities; whilst the above definition from the Council of Logistics Management (CLM) states that bundling is preferred, this later definition entirely eliminates single services or management activities. It also emphasizes the temporal dimension, as it is stated that the relationship between shipper and provider is seen as continuous.

An advanced third party logistics service provider completely integrates its client’s logistics network rather than a normal TPL service provider which simply includes the coordination of the distribution from one place to another. The advanced TPL service provider makes it possible for the companies to develop a superior expertise in transportation, warehousing and other logistics fields (Jonsson & Gunnarsson, 2005).

When talking about TPL in this thesis we refer to one of the definitions discussed above, from the Council of Logistics management, as it opens up for multi-tiered provision structures in which the third party acts as an integrator, whilst at the same time blocking out provision of single services such as transportation.

“Outsourcing all or much of a company’s logistics operations to a specialized company. A firm which provides multiple logistics services for use by customers. Preferably, these services are integrated, or “bundled” together by the provider. These firms facilitate the movement of parts and materials from suppliers to manufacturers, and finished products from manufacturers to distributors and retailers. Among the services which they provide are transportation, warehousing, cross-docking, inventory management, packaging, and freight forwarding.”

(Bagchi and Virum, 1996)

### 1.6 Outline of the Thesis

In order to give an overview of the structure of the thesis, an overall scheme of it will be made in the form of a chart from chapter 1 to the conclusion part, chapter 5.
Figure 1-2: Outline of the thesis

Chapter 1 “Introduction”
This chapter provides the background that familiarizes the reader to the subject. The thesis’ research problem is formulated and defined, and followed by purpose and delimitations. Further, we give a description of the term logistics and third-party logistics; these terms will commonly be used throughout the thesis.

Chapter 2, “Frame of reference”
From this chapter to conclusions, they are all served to answer the purpose of the thesis. This chapter states the theories related to the formulated questions, and also presents the structured results from previous similar studies done in other countries. This will be used for the final analysis in Chapter 4.

Chapter 3, “Methodology”
In this chapter, we explain how the different steps of the research study has been designed and how the empirical work has been formulated. We also give motivations and argue different point of views and method approaches as: qualitative versus quantitative, choice of population; survey type, validity and reliability.

Chapter 4, “Empirical Study and Analysis”
This chapter demonstrates the retrieved empirical findings received from the conducted survey. The frame of reference (chapter 2) is used as a tool when analyzing and comparing the results with former studies; the methodology part (chapter 3) is served as a base for conducting the study.

Chapter 5 “Conclusions”
This chapter presents the results of this study and also presents recommendations for future research.
2 Frame of Reference

This chapter, as the framework chapter, focuses on TPL related literature, theories and previous studies. The chapter goes through theories related Supply Chain Management, TPL establishing process, value creation, the extent of use and the level of commitment to TPL services. These theories are used as tools to help understand the problem and the way of approaching the problem. These theories have the purpose of being used as eyeglasses when we in Chapter 4, attempt to analyze the empirical facts.

2.1 Supply Chain

Supply chain will be used with our interest in this research study referring to deeper understanding of the usage of third party logistics from the buyers’ perspective. According to Gopal & Cypress (1993), supply chain can be defined as:

“A supply chain is the physical network that begins with raw material suppliers and ends with the customer. It includes aspects of product engineering, procurement, manufacturing, physical distribution and after sales service, as well as third-party delivery and supply.”

The chain consists of nodes and links. Links represent transportation and nodes represent the different stages of operations, for instance production, storage, these being vertically networked companies. (Bask, 2001). Thus, the supply chain is a simplified network of different actors or points of activities which are connected together in the process of producing to the final consumer. A similar definition can be found in (Stefansson, 2004):

“A network of connected and interdependent organizations mutually and co-operatively working together to control, manage and improve the flow of material and information from supplier to end users”.

This definition indicated that the activities within the supply chain are not only intra-organizational such as logistics activities might be, but inter-organizational, taking place in two or more organizations. The term supply chain will therefore, in this thesis, stand for the representation of the total network of actors or points of activity from raw material to final consumer.

2.1.1 Supply Chain Management

As a consequence of the chain perspective, the activities of interest not only stay within the domain of one individual firm, but extend to the supply chain where many inter-organizational activities are carried out. The management issues have grown in complexity since there are a number of organizations involved in the goods and information flow. This has raised the need to use Supply Chain Management; the term has also given rise to an intensive discussion of the most applicable definition. Stefansson (2004) defines SCM as:

“The management of upstream and downstream relationships with suppliers and customers to deliver superior customer value at less cost to the supply chain as a whole”.

This definition points out that the management lies outside the boundaries of only one single company and the scope comprises at least first tier suppliers and customers and even further up or downstream in the whole supply chain. This supply chain definition also puts the relationships in focus without defining what the contents of these relationships are. But the management issues must touch upon different aspects of the relationships regarding
the activities around the material flow and the information flow. There are many interfaces; this is emphasized by another SCM definition (Lambert et al. 1998).

“Supply Chain management is the integration of key business processes from end user through original suppliers that provide products, services and information that add value for customers and other stakeholders”.

This definition focuses on the integration of key business processes and thereafter promotes the importance of integration of the interfaces between different partners. The rational behind SCM is that coordinated supply chain participants are able to provide better offers, than uncoordinated ones for on the final consumer market. Supply chain management requires all activities and functions to operate as one individual entity and be managed in a coordinated manner.

An effective SCM includes creative thinking about how to integrate and perform logistics and manufacturing activities (Bask, 2001). Third party logistics providers can be seen as supportive supply chain members. It indicates that the logistics service providers should support alternative supply chain strategies. Lambert et al. (1998) defines the supportive members as

“Companies which simply provide resources, knowledge, utilities or assets for the primary members in the supply chain”.

2.1.2 Supply Chain Integration

Based on the arguments from Berglund (1997), supply chain integration (SCI) is as a result, the actions taken to reach supply chain management (SCM) operations. SCI can be understood as activities or resources increasing the coordination between supply chain participants, for example, supply chain wide information systems. SCM can also be perceived as the process of reaching SCM. Berglund (1997) define SCI as:

“SCI is the change process, or the activities and resources, for integrating the individually governed entities of supply chain in order to achieve or perform SCM.”

2.1.3 The use of TPL services by User Vendors and Customers

It is widely argued that the most significant benefit from progressive supply chain management come from true integration of services along the supply chain (Demers and Sathyanarayanan 2003) it has been of interest to determine if the primary TPL service providers employed by the TPL users also service the major vendors and customers of the users. In 2003 years study in USA (Lieb & Bentze, 2004) 49 percent of the TPL services users reported that their major vendors utilized the same TPL service providers. Further, 57 percent reported use of their primary TPL provider by their major customers. Lieb and Bentz (2004) argue that many TPL users see significant benefits in sharing the primary TPL providers with their major customers and vendors.

2.1.4 TPL partnerships

Historically when the first survey was carried out in Europe in year 1993, it was found that partnerships were typically modest in scope and level of ambition. For example, partnerships were limited to basic transportation and warehousing activities with weak service re-
quirements. This has however changed with time, although these activities still make up a dominant part of the partnerships, information based and value added activities occur to a much larger extent than in 1993. For example, more than half of the partnerships 1998 included labeling activities and almost two-thirds tracking and tracing activities in the survey made in Europe 1998. (Van Laarhoven, Berglund & Peters, 2000)

In 1993 top management was only involved to a limited extent and contracts were extremely detailed, giving the provider little opportunity for own initiative. There was a limited cooperation between the buyer and the service provider (Van Laarhoven et al., 2000).

A provider’s service offerings are usually customized towards the users’ demands, as one could expect. Van Laarhoven et al. (2000) points out a relation between the amount of dedication and the importance of cost reduction as a driver for the outsourcing process. In the Laarhoven argues that joint teams, composed by personnel of both shipper and provider, in many cases are used to manage operations. In the case of true cooperation the teams can be expected to be predominantly involved in managing the outsourced activities. However, their main task is solving day to day problems. Cooperation seems to be there to work more in a reactive manner than proactive mode. This shows a clear separation between the user and provider. The user will take responsibility for the logistics activities to be outsourced, by specifying them in detail in the contract and using targets and performance indicators, and the provider would be responsible for the execution of these activities. (Van Laarhoven et al., 2000)

The above references regarding the knowledge of supply chain are served as the basic understanding of more integrated operation and management of the entire logistics activities for the company. It also gives some connection to the construction of our last survey question which we consider the users’ use of TPL from a supply chain perspective.

2.2 The third party logistics establishment process

Referred to Skjoett-Larsen (1995) in Lindskog (2003), there are six different phases of TPL establishment; they are preparation, selection, contract, implementation, improvement and renegotiation. These will be discussed further below.

2.2.1 Preparation

Companies can either keep logistics functions in house or outsource them. A number of advantages and disadvantages of using outside logistics services have been identified in the literature. Third party logistics service is a strategic partnership between the firm and the logistics company. The impact on the organization should be considered carefully before making the decision to outsource (Bhatnagar et al., 1999). In many instances, when the possibilities of outsourcing logistics activities is initially discussed in the organization, logistics managers would be often less than enthusiastic; multiple reservations were expressed.

The first step is to make sure that the TPL users are doing the preparation properly. As outsourcing logistics activities have widespread strategic and organizational consequences, it is essential that decision to outsource is preceded by extensive analysis of the current logistics system, costs, service levels and establishing cost service targets to be achieved through TPL. Sink & Langley (1997) and Bagchi & Virum (1996) have identified 2 steps that need to be addressed prior to selection; they are “Identify need to outsource logistics” and the “Need awareness”. The point here is that the process of establishing TPL includes
the events that lead to identifying TPL as the desired future state. The last activity in the preparation phase is according to Skjoett-Larsen (1995) in Lindskog (2003), the development of a Request For Proposals (RFP), an activity in which much of the work regarding service specification is carried out.

2.2.1.1 Impact

TPL is a strategic partnership between the logistics company and the firm. Browersox (1990) has observed that there needs to be an imperative for the relationship to succeed in working together, a match between the cultures of the two organizations. So before making the decision to outsource, the impact on the firm should be considered carefully.

Liebel et al. (1993b) divides the impact on the firm in two areas, Impact on the organization and impact on the customers. It is important that the customers play a part in the decision making process, especially if they will come in contact with them. There needs to be an understanding for customer requirements, this will help determine the needs for the firm (Gooley, 1992).

2.2.1.2 Reasons for using TPL

Different studies about organizational impact indicate that there has been a positive impact on the organization when outsourcing logistics; multiple benefits have been experienced by organizations in different countries. These can be classified as finance-, strategy- and operations-related.

Most buyers would expect benefits of cost-related advantages, through synergies, investment reduction, turning fixed costs to variable, economies of scale and better utilization of resources by the provider (Bardi & Tracy, 1991; Van Laarhoven et al. 2000; (van Damme & Ploos van Amsel, 1996). Top five reasons for using the TPL services have thought previous studies included the logistics cost reduction, thereby reducing the costs of servicing the customer. Sahay & Mohan (2006). However cost reductions are not always realized due to unrealistic fee structures projected by service providers. (Ackerman, 1996) Cost savings can be hard to evaluate due to shipper’s lack of awareness of internal logistics costs. In reality, the outsourcing option may be chosen to give an indication of in-house costs and serve as an external benchmark for logistics efficiency (van Laarhoven et al., 2000).

Organizations want to provide improved customer service by using the competencies of the service providers. Lack of specific knowledge of customs, tax regulations and infrastructure of destination countries has forced firms to acquire expertise of TPL service providers. (Byrne, 1993; Foster & Muller, 1990; Trunick, 1989) in (Sahay & Mohan, 2006). TPL providers can contribute to improved customer satisfaction and provide access to international distribution networks (Bask, 2001) As a result, outsourcing non-strategic activities also allows organizations to concentrating their energies on core competence and activities and use external logistics expertise (Sink & Langley, 1997).

In the European study made in 1998 (Van Laarhoven et al., 2000) the most important strategic reason for users to be interested in outsourcing their logistics activities is a need to reduce cost or amount of capital invested. Other reasons that then scored high are where service improvements, the need for strategic flexibility and the focus on core competencies. The response in the 1998 year study in Europe was very similar to the scores of 1993.

Regarding operational advantages of TPL, reported benefits include reduction in order cycle times, inventory levels, lead times and improvement in customer service. The service
improvement is mostly attributed by the provider expertise (Bhatnagar & Viswanathan, 2000; Daugherty et al., 1996; Wong et al., 2000; Laarhoven et al, 2000)

An important development is the increased emphasis in supply chain management, and being able to use this as a competitive advantage. Initially, time based competence in companies led to a rapid adoption of new manufacturing methods like computer aided manufacturing, just-in-time and flexible manufacturing systems. By focusing on lead times and improved quality, these methods led to enhanced supply chain performance. For further enhancements Bhatnagar et al 1999 in (Sahay & Mohan, 2006) emphasizes the need to speed up the flow of information on orders to the upstream supply chain partners, and accelerating logistics activities like delivery of materials or products through the entire supply chain.

Finally, two other outcomes of the outsourcing process are a decrease in the size of the user’s logistics department (although in many cases there simply is a transfer of personnel from the user to the provider) and a slight simplification of the planning and control process. (Laarhoven et al. 2000)

Comparison studies done by Lieb et al. (1993a) indicated that the Western European firms experienced greater benefits than the US manufacturing firms, in addition, Western European firms would have attained more positive results regarding the logistics systems performance, logistics costs, customer satisfaction and employee morale owing to their greater experience with TPL.

Suggested by Berglund (1997), from a transactional cost perspective, the outsourcing of logistics will increase so-called “switching” costs, and thus the dependence on external providers will be increased.

2.2.1.3 Concerns

The range of concerns mentioned before the start of a partnership is wide. Previous studies have reported managers having expressed reservations when the possible utilization TPL was first discussed. According to Darphin et al (1996), 30% of the respondents had such concerns. The same concerns were noted my Sohail et al (2004) and Lieb (1992).

Laarhoven et al. (2000) has come with the conclusion that once a partnership is implemented, the concerns invariably decline. However, IT and concerns about the quality of the service still are present when the partnership is up and running.

The study carried out by Lieb et al. (2004) showed that 40 percent of the respondents reported a negative or very negative impact on employee morale which was larger than any previous studies. This negative impact has historically been related to the downsizing of the logistics workforce that typically accompanied a decision to outsource logistics functions, he also stated that it might be that as the long term users cut more deeply into the full-time logistics workforce, the remaining workers would become more skeptical about their future with those companies. The same issue has also been addressed by Sahay & Mohan(2006) and Dapiran et al.(1997), they suggested that people issues are a critical factor to be considered in outsourcing of logistics functions though most of the respondents proved that usage of TPL services had a strong positive impact on logistics system performance, customer satisfaction and employee morale. The same study showed that there were improvements in sales revenue, working capital, capital asset, and production costs.

Implementation of TPL outsourcing is often accompanied by business reengineering which creates an uncertainty for both the TPL service provider and the management reporting
structures and responsibility within the client. The issue of information technology is primary one of compatibility and integration of systems, not just between the client and the TPL provider, but also with other supply chain partners and customers (Lieb & Randall, 1999).

The most cited risks are associated with loss of control over the logistics function, uncertainty about the level of service and loss of in-house capability and customer contract (Ellram & Cooper, 1990). Other authors cite problems regarding inadequate provider expertise, disruption to inbound flows, inadequate employee quality, sustained time and effort spent on logistics, loss of customer feedback and inability of TPL providers to deal with special products needs and emergency circumstances (Ellram & Cooper, 1990; Gibson & Cook, 2001; Sink & Langley, 1997; van Laarhoven et al., 2000) Despite gaining access to logistics information systems (Roa et al., 1993), shippers appear to be dissatisfied with service provider’s IT capabilities and prefer to rely on in-house systems instead (van Laarhoven et al., 2000). It is usually the case that companies use a mixed strategy concerning logistics and keep important logistics activities in-house (Wilding and Juriado, 2004). While it is reported that users of TPL improve their flexibility with regard to market and demand changes, lack of responsiveness is also cited as a problem of outsourcing (van Damme and Ploos van Amstel, 1996).

The other common concerns related to such issues as estimating the true cost of third party services and the potential internal problems that such a shift might cause, for instance, the displacement of personnel. Similar result was also obtained from the survey made by Dapiran et al, (1997) for Australian firms. Study made by Millen et al., (1997) stated that no Australian respondent encountered any difficulties in merging information systems; however, this was the next most commonly cited implementation issue by American and Western European executives.

2.2.2 Selection

The potential TPL service provider can be identified by using the detailed RFP and multiple sources of information. The financial strength and capability to provide the requested services are important factors for selecting candidates. Visits and references from external actors are ways of gathering information about TPL for the final selection of TPL provider is proposed by Skjoett-Larsen (1995) in Lindskog (2003), Sink & Langley (1996) suggest the use of outside consultants. A quantitative tool such as the analytic hierarchy process has been put forward from Bagchi & Virum (1996).

2.2.2.1 Sources of information on TPL providers

There are different ways of achieving knowledge about the TPL providers, prior studies have indicated that the most common ways are sales calls by representatives of the TPL firms and discussions with other logistics professionals in Australia, Western Europe, America (Millen et al, 1997). In Saudi Arabia and Singapore, it was the same situation that the sales calls from the representatives of the TPL firms were the most popular way with 40% (Sohail et al, 2005; Bhatnagar et al, 1999).

2.2.2.2 TPL Decision making process

The decision to outsource or not outsource logistics activities relies on a number of variables, which are categorized into both external and internal considerations. Roa and Young (1994) have identified factors such as risk and control, centrality of the logistics
function, cost/service trade-offs, information technologies and relationships with TPL providers. The concept of logistics complexity is also mentioned to include a number of vital drivers that affect on the above identified factors. Roa and Young, (1994) also mention process related (e.g. cycle times), product related (e.g. special handling needs), and network related (e.g. countries served) drivers as to being believed to have an indirect influence in the outsourcing decision.

The outsourcing decision are also highly affected on cost/service trade off and on the cost evaluation between options. Costs connected with performing logistics activities in house and investment in capital of assets in trade offs against service provider’s fees. The lowest will be chosen (Van Damme and Ploos Van Amstel, 1996). However, cost is not the sole most important decision variable; logistics service issues are also well thought-out (La Londe and Maltz, 1992; McGinnis et al., 1995).For instance Maltz (1994b) examined the relative impact of cost and service on the decision to outsource warehousing and found the organizations were hesitant to use third-party warehousing due to customer service consideration.

Several authors have applied transaction cost economics (TCE) theory to the logistics outsourcing decision. For example, Aertsen (1993) argued that high asset specificity tied with difficulties in performance measurement should lead to in-house distribution. Maltz (1994a) found that high asset specificity is associated with in house warehousing, whereas high transaction frequency leads to outsourcing. Skjoett-Larsen (2000) combined asset specificity and uncertainty to create support for the outsourcing decision; TPL providers must be used in the case of medium- specific assets or in case of high asset specificity, but low uncertainty.

Van Damme and Ploos van Amstel (1996) discuss four categories of considerations related to the following issues:

- Market issues (demand variability and customer service),
- Economic viability,
- Personnel/equipment availability
- Extent of supplier dependence.

They also identify several favorable conditions for outsourcing such as expand assortment and demand season ability (Van Damme and Ploos Van Amstel, 1996). Hong et al. (2004b) discuss determinants of outsourcing in terms of the shipper’s firm’s characteristics (e.g. firm size). In the same way, Daugherty and Droge (1997) link the logistics outsourcing decision to the shipper’s organizational structure; decentralized organizations are expected to outsource more in comparison to shippers that organize their activities centrally.

The decision to outsource logistics can also be driven by capability and resource considerations (Bolumole, 2001). Forming relationships with TPL providers is an efficient and effective means of attaining the required service avoiding to invest heavily in assets and new capabilities (van Laarhoven & Sharman, 1994). Whatever the base for contract logistics, it is noted that the outsourcing decision should be examined in the context of corporate and logistics strategy at specific time periods (Fernie, 1999).

Lieb et al(1993b) , Dapiran et al.(1997) and Bhatnagar et al.(1999) have identified several important factors that define the decision making process. Previous researchers have asked
managers to specify the organizational level at which the decision to outsource was made, the functional areas included in the process and the reservations expressed within the firm to outsourcing. Respondents were also asked to identify their sources of information regarding third-party firms and their selection criteria.

**2.2.2.3 Organizational level at which the outsourcing decision is made**

Millen et al. (1997) pointed that the differences between countries, regarding organizational levels which have been involved in the strategic decision to use contract logistics services. Western European firms are almost likely to make the decision at the corporate level, whereas American firms are almost as likely to make the decision at the corporate or the divisional level. Australian firms are split rather equal among the three levels, with the local level signaling higher than the other two regions. Sohail et al. (2005) stated that it was mainly at the corporate level where the decisions to use TPL services are originated in Saudi Arabia. However in Singapore, study showed that it was mainly within the local level where the decision was originated, and then it would come to the corporate level (Bhatnagar et al, 1999). Detailed figures can be found in Appendix 6.

**2.2.2.4 Involvement of managers in functional areas**

Aghazadeh, (2003) suggests that a team representing all departments within a company should make the decision on outsourcing. However being more specific in terms of involvement of other functional area in the decision making process, it has been indicated that both marketing and finance have been largely involved in several prior surveys (Millen et al, 1997; Sohail et al, 2005). Manufacturing was involved to a great extent in the decision process for both Australian and American firms. However in Singapore, the highest involvement was the marketing function (70.8%) followed by finance function (50%) and manufacturing function (31.3%) (Bhatnagar et al, 1999). The same has also been identified in Western Europe where the marketing are mostly involved (78%). For a detailed overview see Appendix 6.

**2.2.2.5 Factors impacting on the decision to outsource logistics activities**

Empirical studies suggest a number of reasoning making final decision on outsourcing. Sohail & Sohal (2003) identified the factors in Malaysia as major depending on cost savings, improved service, better transportation solutions and better professionalism. Steffi (1990) further noted the motives for outsourcing in USA, he included focus on core businesses; improved service; development of necessary technological expertise and computerized system; and need for better equipped logistics services. Sink & Langley (1997) found that the most important criterion was core competencies. Many other studies have reported a number of other driving reasons for outsourcing logistics functions (Sohail et al., 2006; Daparin et al., 1997; Bhatnagar et al., 1999).

In determining why Singaporean companies decide to outsource their logistics functions, respondents see the following factors as substantially important; cost savings (86.8%), customer satisfaction (76.3%) and flexibility (75%) Bhatnagar et al (1999). 65.8% of the users identified productivity improvement as substantially important or very important in their decision making process. Other factors like focus on core business and access to up to date techniques and expertise were also identified by around 40% of the users as being substantially important or very important.
Outsourcing has an impact on several areas; Appendix 8 provides an overview of areas, such as logistics costs, logistics system performance, customer satisfaction, which have been reported as having a positive or very positive impact.

2.2.2.6 Evaluation Criteria for TPL providers

Sink et al. (1996) found that the most important criterion for the selection of third party logistics providers was core competencies. According to Bhatnagar et al (1999), a third party firm with experience, focus and expertise will be regarded as more competent than those TPL suppliers who profess to provide all things to any customer. Issues of expertise, reputation, experience and reliability were often mentioned in relation to the emphasis on TPL providers’ core competencies which was considered as the primary issue in relation to the evaluation of potential providers, price was considered as a secondary issue. He also stated, to provide the high level of customer service, TPL company must employ the best people with the relevant expertise. It is also reflected in the study of Dapiran et al. (1996) and Lieb et al. (1993b); they found that while the cost and service are the most important criteria, prior experience with the TPL provider, company reputation, “total service package offered”, and information system compatibility were other important factors.

An important requirement, found in the Singaporean study, for assessing the performance of logistics service providers is the presence of meaningful quantitative measures (Bhatnagar et al., 1999). On-time shipments, inventory accuracy, shipping errors and customer complaints are four of the most important performance measures used by the 90% of the user companies. Fill rate, stock outs, warehouse cycle time and total order cycle times are actually not considered as important performance measures by many companies. The results might imply that the focus is on providing a high level service to the customer at the expense of internal inefficiencies (Bhatnagar et al,1999).

2.2.3 Contract

When a provider is selected and the services included in the arrangement are specified, a contract can signed between the parties, in which the main terms of the deal are specified. This should be complemented with detailed working manuals, in which detailed tasks, service targets are specified. The TPL providers performance can be measured and controlled and the extent to which this is done can effect on whether the provider is paid by actual performance (e.g. numbers of orders picked, packed, and shipped to the customers) or according to behavioral outcome (e.g. salaries, hours, and/or miles). To a similar extent, penalties for non performance can be added into the contracts.

Laarhoven et al. (2000) has noted an increasing level of sophistication of partnerships in the formation of contracts. On the one hand 75 percent of the partnerships include contracts in their agreements in 1998; on the other hand just over half of the cases include detailed specifications about performance targets. This percentage is down from 63 percent in 1993, indicating that providers have more flexibility and can be more creative in shaping the logistics activities that they carry out. At the same time, 40 percent of the contracts in 1998 contain penalty clauses for providers in case they do not meet the performance targets, this can be compared the result from 1993 years survey which reported 27 percent.

Sink & Langley (1996) indicate that the routinely contract periods of one to three years are most commonly agreed upon, but longer periods might be required if the TPL providers are to undertake major investments for the specific customer. It can be noted that Singaporean firms in 72 percent of the cases have contracts lasting for more than 5 years.
The 2004 survey regarding the use of TPL services by large American Manufacturers, conducted by Lieb & Bentz (2005a) addresses such issue, those surveyed were asked to identify the importance of the criteria ranking from 1 to 3 in terms of service considerations, cost considerations, IT capabilities, reliability, in order to determine if TPL contracts should be renewed. The survey result indicated that the service considerations tend to dominate the renewal process; however, cost considerations were identified as being the most important criteria. Andersson & Norrman (2002) point out that negotiations and contracting are heavily dependent on the complexity and uncertainty of the arrangement, so in some instances, service specification, negotiation of terms and contract formulation might take place during or even after the formal contract is signed.

Halldorsson et al. (2007) presents the principal-agent theory (PAT). It deals with issues regarding balancing the need of the buyer and the capacity of the TPL provider. The PAT advocates an inter-firm contracting perspective on TPL, focusing on developing the most efficient combination of outcome and behavioral incentives in the contact between the buyer and the seller of logistical services. Not all aspects can be covered by the contract that is why the issue of contracting should be a revising subject in TPL relationships. Skjoett-Larsen (1995) by Lindskog (2003),

In cases where a contract is up for renewal, Laarhoven et al., (2000) has noted that there is a strong tendency for buyers to go for lower prices or even send out a tender to the market to benchmark the performance of the current service provider. Another observation Laarhoven’s (2000) survey in 1998 encountered was that only 37 per cent of those shippers involved in a partnership for four years or less termed their partnership “highly successful” (this percentage is 67 for partnerships older than four years). Laarhoven (2000) explains this as a natural phenomenon (as partnerships progress over time, changes are made to meet customer needs better and increase satisfaction), and suspects that shippers that are joining the outsourcing wave as of late are less easy to satisfy than those that started their outsourcing a few years prior to 1998.

2.2.4 Implementation

In the implementation phase, responsibility for provision of the included services will be transferred from the customer to the provider. The cross-functional teams with members from both organizations will be established for the training purposes. It is indicated by Sink & Langley (1996), that a strictly planned approach is required in order to implement the partnership smoothly which should be manifested by the writing of a thorough transition plan in co-operation between the two parties. Skjoett-Larsen (1995) in Lindskog (2003),

2.2.4.1 Retraining, displacement

Several studies have shown that the use of contract logistics services led to the elimination of some full time logistics related positions. Different studies also showed that there were a variety of methods being used in the displacement of logistics personnel. The typical methods have been transferring within their firm, being recruited by the contract firm, or the termination of employees, early retirement. (Lieb, 1992; Dapiran et al 1996; Sohail et al, 2006; Sohail et al, 2005, Dapiran et al, 1997).

As the introduction of contract logistics services into a company represents an important shift in the way that the business is conducted, according to Sohail et al (2005), 38% of the respondents indicated that there was a need for retraining employees. Only 15% of respondents from Malaysia indicated retraining employees was necessary (Sohail et al, 2006).
Retraining has been noted to be needed in the following areas; information system (Millen et al 1996; Millen et al. 1997; Sohail & Al Abdali, 2005), team building, change management, new technologies (Millen et al. 1996; Millen et al. 1997), improving communication skills, improving employees ability to adjust to new environment, comprising of amendments to operating process (Sohail & Al Abdali, 2005).

2.2.5 Improvement and renegotiation

When the transfer is completed and the provider has assumed responsibility for producing and managing services, the TPL management is moving on to the improvement phase. The main activities of this phase apart from the actual services provided by the TPL provider are continuous evaluation and development. It is important to have further education and training. As the initial contract period ends, it is time for renegotiation. It should be started well in advance of the end of the contract period, as time for evaluating the process should be provided for the customer to develop a new RFP and obtain bids from competing service providers Skjoett-Larsen (1995) in Lindskog (2003).

The above phases and points provide a detailed background for the TPL establishment processes; they are served as the basic knowledge to construct the survey questionnaire under the section of organizational impact.

2.3 Value creation by TPL

The challenge that TPL providers face is to provide customers with services that add more value to the process of transformation than the customer can achieve internally.

According to Berglund (1997), the assumption on value creation for the TPL users is that all firms are in general capable of performing all types of logistical services or functions at the same performance level. The difference between them basically depends on the different economical resources available for logistics within different firms. All physical resources and skills for all services can be acquired and kept within the firm if enough financial resources are available. Berglunds (1997) argument is that the basic difference between logistics service providers and the customers in terms of economic situation is the primary source for differences in logistics services availability and performance. The basic difference in economic situation is that in logistics firms resources are allocated to logistics, whereas in the customers’ organizations logistics is only one area among many activities. Thus, a logistics service provider can acquire more physical resources and skills than a company mainly engaged in the process of transformation given the same financial resources. So it allows possibility for a logistics service provider to perform more logistical services at higher performance level. Bearing this in mind, value for customers can be created in different ways.

2.3.1 Operational benefits

Looking into the operational benefits will show why a company may choose to outsource. According to Berglund (1997), there are two aspects of operational improvements.

First, one of the most important reasons for outsourcing logistics is the access to services or production factors for logistical services not available in the customer’s own organiza-
tion. There might be a need for specialized expertise and technology that can not be economically maintained within an organization. It is important to have access to up-to-date technology to maintain a competitive advantage.

The other aspect of operational improvement is the possibility to alter and enhance the performance of operations previously managed internally. Improvements mentioned by Lindskog (2003) are in terms of flexibility, quality/service, speed and consistency of service, and efficient performance of service.

2.3.2 Economic benefits

The economic benefits from outsourcing can be retrieved from general lower costs due to lower factor costs or economics of scope/scale. Avoiding capital investments has the positive effect of releasing capital for other usage. By outsourcing, fixed costs can be transformed into variable costs, e.g. more outputs. There exists a problem in companies, where the costs related to logistics are hard to trace; it is hard to clearly separate them from other costs. Thus, outsourcing the activities would enlighten and make this information more clear and controllable (Berglund, 1997).

2.3.3 Managerial benefits

Managerial benefits can be achieved from both sides, it can be used to access managerial skills not contained within the company; it can also be used for aiming internal managerial resources towards other more profitable uses, in line with the strategic core concept. Outsourcing allows the company’s personnel to focus on company’s core activities, while profiting from gaining access to other companies’ core capabilities (Berglund, 1997).

2.3.4 Strategic benefits

Flexibility both in terms of geographic coverage and adaptation to changing conditions is suggested as one of the strategic benefits. Concentration on core activities is also important on strategic level in terms of management. Another benefit is the risk sharing can be gained by using service providers with multiple TPL users (Berglund, 1997).

2.4 Extent of use of the third party logistics services

Bhatnagar et al. (1999) suggested that the longer the relationship between manufacturing firms and the TPL providers, the more extensive would be the usage of third party logistics services, the higher would be the level of commitment to the relationship on either side, and more likely firms would be willing to invest in contract logistics.

In addressing this topic, managers in the different countries have been asked to specify for their firm the level of commitment to the use of TPL companies, the geographical coverage provided by their TPL firms, the percentage of the total logistics budget allocated to TPL providers, and the third-party services utilized. Managers were also asked to provide information regarding the use of contracts with their TPL providers; namely, whether contracts are employed, the nature of these contracts and the average time duration of these contracts.

Lieb et al. (1993b) compared the experience of the US and European manufacturers in using third party logistics, similar conduction has also been made in Singapore by Bhatnagar
et al. (1999), Australia by Dapiran et al. (1997). In order to define the extent of usage, the common examined factors need to be included are: the company’s commitment to the usage TPLs; length of experience in using third party logistics services; percentage of total logistics budget allocated to third party logistics providers; nature and length of third party logistics; contractual obligations, if any.

2.4.1 Level of commitment

The degree of commitment to using the services of TPL providers varies between the different countries. The table in Appendix 4 gives an overview of different studies that have been made. Around one-half (Millen et al., 1997) of the WE firms characterize this commitment as extensive versus 7 per cent (Lieb & Randell, 1997) of the US firms. Alternatively, more than one-half of the US firms describes their commitment as limited or very limited versus 31 per cent of the WE firms. Bhatnagar et al. (1999) have analyzed the TPL scenario for the Singaporean firms. The result shows over 75% of the users characterizing the commitment to TPL firms as moderate or extensive. Dapiran et al. (1996) have presented an overview of the TPL usage by large Australian firms, the survey findings indicated that the Australian firms are comparable to US firms in their usage of TPL services, with more than one-fifth of the firms characterizing their commitment to TPL as extensive. In both Ghana, most of the users were identified with moderate to extensive usage of TPL services (Sohail et al., 2004). In India, most of the users were identified with moderate usage (68%), and there were 32% of the users used the services very limited.

The percentage of respondents using TPL services varies in different countries; over 60 percent of respondent companies have been using TPL services in Australia, USA, Singapore, Malaysia and Saudi Arab (Millen et al, 1996; Lieb & Bentz, 2004; Bhatnagar et al., 1999; Sohail & Sohal, 2003; Sohail & Al-Abdali, 2005). There is almost half of the respondent companies use the TPL services in Western Europe (52%) and India (55%) (Millen et al, 1997; Sahay & Mohan, 2006). The detailed data is provided in Appendix 4.

Of the data above the following percentage of respondents has been using more than one TPL providers. Comparatively, this group of respondents is more than the number of companies uses only one TPL providers in all of the countries.

2.4.1.1 Percentage of total logistics budget allocated to third party logistics providers

The percentage of the total corporate logistics budget paid to the TPL firms was also included to gauge a company’s commitment (see Appendix 5).

The study made by Millen et al (1997) indicate that European firms were significantly more committed and allocated a larger share of the overall logistics budget to their TPL companies, compared to the US counterparts. Sohail et al. (2005) stated that in Saudi Arab nearly 45 percent of the users allocate 20 percent or less of their logistic budget to TPL, and 13 percent of users allocate over 60 percent logistics budget. Bhatnagar et al. (1999) have analyzed the TPL scenario for the Singaporean firms and state that 20% of the firms allocating over 30% of their total logistics budget to TPL providers. Dapiran et al. (1997) have presented an overview of the TPL usage by large Australian firms; the survey findings indicated that the Australian firms are comparable to US firms in their usage of TPL services, one quarter of the firms allocating more than half of their total logistics budget to contract providers. However, in India, 63 percent of the firms allocate 11-20% of their logistics budget to TPL providers, and only 29 percent allocate over 50 percent of logistics budget
to TPL providers (Sohay & Mohan, 2006). There are also only 6 percent of the users spent over 50 percent of logistics budget on outsourcing logistics in Ghana (Sohail et al, 2004)

2.4.1.2 Length of experience in using TPL services

In Lieb et al (1993), almost all respondents in the survey were found to have negotiated specific TPL contracts of periods ranging from one to three years in both Australia and America. The survey made by Sohail et al (2005) indicated that 50 percent of the respondents have been using the services of TPL providers for over three years in Saudi Arab. Study in Singapore also indicates that firms using contract logistics services most are relatively experienced with 84 percent of them doing so for more than three years. This represents a significant amount of experience with TPL amongst Singaporean companies (Bhatnagar et al, 1999). In Ghana, study shows that most of the firms with 68 percent have been using the TPL services between three and five years (Sohail et al, 2004). The survey made by Millen et al (1997) indicated that 79 percent of the respondents have been using the services of TPL provides for three to five years. See appendix 4 for detailed data.

2.4.2 TPL services used

Through literature review a mismatch can be noted between supply and demand for logistics services (Murphy and Poist, 2000) Evidence from industry surveys show that while TPL service providers expand their offerings to include contract manufacturing, information systems, consulting and even purchasing and financial services, there is a low uptake of such services and buyers in general have a preference towards outsourcing transportation and warehouse related functions (Lieb & Bentz, 2005a; Lieb & Kendrick, 2003; Lieb & Randell, 1999).

The literature appears to focus in the demand side of TPL, a large number of studies focus on the extent of TPL usage across specific countries/regions and industries. Lien and colleagues (Lieb, 1992; Lieb and Bentz, 2004, 2005b; Lieb et al., 1993; Lieb & Miller, 2002; Lieb & Randell, 1996) are well known for carry out annual surveys in the USA. Main issues examined by such studies include services used, usage rate, contract renewal rates, outsourcing costs and geographical spread of services. Generally speaking, findings indicate the importance of transport, warehouse and administration related services and confirm the continuing growth of logistics outsourcing (Ashenbaum et al, 2005; Lieb and Bentze, 2005b; Murphy and Poist, 1998)

Research regarding TPL usage also includes experience from specific countries. Country specific studies appear to stress the prominence of transport and warehousing services and also identify other activities with potential to grow. (Dapiran et al, 1996; Sohal et al., 2002; Hong et al., 2004; Sohal & Sohal, 2003; Maltz et al., 1993; Sankaran et al., 2002; Bhatnagar et al., 1999)

Overall, there appears to be a weak demand for value adding solutions such as information systems, 4PL and manufacturing related services (van Hoek, 2000a, b, van Hoek & Dierdonck, 2000). Most clients' organizations see such activities as too important to outsource and express their reservations about TPL service providers' capabilities in those areas. Wilding & Juriado (2004) suggest the services are supply driven and do not reflect the buyers needs.
2.4.2.1 Logistics activities outsourced

Exactly what the firm needs to outsource depends on the individual needs and strategies (Lynch, 2000). Some firms choose to contract for entire logistics or supply chain functions. More often, certain firms will outsource the individual or combination of areas which are not core strength of their companies. A strategic issue is how the users feel that TPLs should position themselves in terms of breadth and depth of service offerings. Overall, in consistent with findings reported in earlier years’ studies, respondents agree significantly with the statement that, TPL suppliers should provide a broad, comprehensive set of service offerings. This implies that there may be increased interest and desire at the client level for a single-source solution role to the provision of integrated logistics services. (Bardi et al., 2003)

According to Wilding and Juriado (2004) firms within the European consumer goods industry use both in-house and contract logistics, with transportation and storage to be the most-often outsourced services. Other studies also show that TPLs users outsource services in bundles (e.g. warehousing and inventory control) by combining activities which share common transactional elements and information flows (Maltz and Ellram, 2000; Maltz et al., 1993). Appendix 10 summarizes the use of specific logistics services that were reported in different studies.

According to Bhatnagar et al (1999), a mix of internal and external logistics services provided better control and balance to ensure consistency and flexibility, and cross pollination of best practices and industry expertise. The most frequently used contract logistics services by Singaporean firms are shipment consolidation which is outsourced by more than one half of the firms. Other major outsourced activities are order fulfillment, carrier selection and freight payment (Bhatnagar et al, 1999). In India, out of the total number of respondents, more than half the organizations have already outsourced logistics activities such as transportation, and custom clearing and forwarding. The other important services that are already being outsourced are import and export management, warehousing, labeling and packing, fleet management and consolidation (Sahay, et al, 2006). Suggested by Dapiran et al (1996) it appears that it is the most “hard” asset intensive activities have been allocated to the third party logistics providers.

Millen et al. (1997) identified the most frequent TPL services used by West European firms are Warehouse management/operation (78%), Shipment consolidation (56%) and carrier selection (52%). In Ghana, the most top three frequently used outsourcing logistics are rate negotiation, carrier selection and inventory replenishment.

Lieb and Bentz (2005a) notice the most frequently cited services to be warehousing, freight bill payment, freight charge auditing, customs clearance, pickup and delivery, freight consolidation, consulting, information technology/EDI capability; inter modal services, order picking and packaging in America. However, the research showed that there was a lack of matched pairs in the sample that is an overlap on provided services, but it might reflect the fact that providers might often focus on strategic offerings, whereas customers tend to be interested in operational services. On the other hand, the mis-match between services offering and services required may affect general customer satisfaction with TPL companies. The mismatch phenomena also have been evidenced from other industry surveys which indicate that while logistics service providers expand their offerings to include information systems, even purchasing and financial services, the acceptance or usage rate is actually low. In general, the preferred outsourcing activities are transport and warehousing related functions (Lieb and Bentz, 2005a; Lieb and Kendrick, 2003; Lieb and Randall, 1999).
To reach a better understanding of those who are not among the users of TPL, studies have asked a number of questions regarding their choice not to be involved. In Langley, Allen and Tyndall (2001) 2001’s study there were two major reasons, “cost would not be reduced” (63%), and “control over outsourced functions would diminish” (63%). Also there were several other reasons, including: “service commitments would not be met” (48%), “logistics is a core competency” (44%), “we have more expertise” (44%), and “logistics too important to outsource” (44%) (Bardi et al., 2001).

Interestingly, as reported, there are many existing customers of TPLs who satisfied with such relationships because they help to improve control (rather than diminish) over certain outsourced activities. Also reported as a reason not to outsource is the belief that firms can perform internally at least as effectively as would be expected of a TPL. If this is true then the choice of not using a TPL is understandable. The results from user firms however, document that, although here is room for improvement, users historically have been satisfied with TPLs, both from cost and from service perspective. (Bardi et al., 2001)

2.4.3 Geographical perspective

Our interest in considering the more specific geographical elements is due to the increase trend in the international trade or establishing manufacturing and/or distribution facilities abroad must bring the logistics activities with abroad countries for Sweden. For instance the tendency in globalization:

- More materials, components, subassemblies and finished products are traded internationally. More specific case is the increase in the relocation of manufacturing activities to Asian countries.

- EU enlargement with the Eastern Europe has increased the possibilities for foreign firms to export to those regions or even move manufacturing activities in cooperation with local partners.

Globalization brings large opportunities for Swedish companies. It is extremely important for Swedish industry to access to foreign markets since the size of home market is relatively small. It strongly relies on foreign trade which has been an important force behind the development of Sweden into an industrialized nation with a high standard of living. Remarkably, no less than 45% of Sweden’s GNP is generated by export. Today almost 75% of Sweden’s foreign trade is with other European nations. United States is also an important market for Sweden, about 15% of the Swedish export is to United States. The increase in world trade has been driven by rapid specialization by international companies and the growth of new countries as significant trading nations, mainly in East Asia and Eastern Europe. Swedish statistics also shows that there is a big increase in the trade with EMU countries with the export by 7 percent, and imports by 13 percent (SCB, 2007). According to Swedish trade Council in China, China has been selected as a specific emphasis in the geographical part, due to the rapid growth of Swedish firms’ presence in China. In comparison with 2003, it has been doubled. At this point, the manufacturing goods manufacturers have taken the lead and now dominate the Swedish presence in China. China is not only a large market, but an increasingly important production site for their global operations. According to anecdotal evidence an increasing number of companies are incorporating their operations in China into the global supply chains (Schwaag & Widman, 2005).

According to different authors, the geographical coverage of TPL services from firms in different countries are different, more percentage of firms from Australia have used more
for domestic purposes, firms in USA, Western Europe, Singapore and Malaysia have used more for both, domestic and international purpose.

Different from the other studies, Lieb, Bentz(2005) pointed out that many of the companies identified as TPL users use outsourcing logistics services in multiple geographies which are included by Lieb et al.(2005) as Canada, Mexico, Latin America, Western Europe, Eastern Europe, Asia(excluding China), China and India. The most impressive coverage is Western Europe with 65 percent, China with 63 percent and Eastern Europe with 58 percent. He also indicated that the significant growth in TPL use in China reflects the rapid economic growth of the country, where is not only sourcing and manufacturing locations for American manufacturers, but also as end markets for many of their products. The growth reported in the Eastern European market is at least partially related to the recent expansion of the European Union. In May 2004, the EU expanded its membership to twenty five countries by admitting ten Eastern and Southern European countries. The expansion effectively created the largest single trading bloc in the world, which resulted in the sales growth for US good within the new EU countries, meanwhile, there is possibility to establish new manufacturing operations in those countries and reconfigure the companies’ logistics operations in Europe. Correspondingly, he indicated that the most important TPL services required in those countries to support their logistics strategies are distribution services, warehousing, direct transportation, customs brokerage, management of spare parts inventory, and retrieval of end-of-life products.

2.4.4 Plans for the future

Focus about this issue is on the companies’ future plans regarding the utilization of third party logistics services, and whether firms are satisfied or not with the performance of their current TPL providers; whether firms are considering changes in the level and nature of their involvement with third party providers. Almost all the studies indicated that the user firms using contract logistics services are satisfied or very satisfied with the performance of their third party logistics services providers. In Australia, Malaysia, almost all the respondent users (over 96%) are at least satisfied with the TPL services (Millen et al, 1997a; Millen et al, 1997b; Millen et al, 1997c; Sohail & Sohal, 2003). The percentage number for the satisfied and very satisfied ones are also very high; over 85 percent in USA, India and Saudi Arab (Millen et al, 1997; Sahay et al, 2006; Bhatnagar et al, 1999; Sohail et al, 2005). For detailed satisfaction level in percentage, see Appendix 13.

2.4.4.1 Value change over time

Not surprisingly, 94 percent of the Australian respondents, 98 percent of the Western European respondents and 90 percent of the US respondents indicated that the use of contract logistics services had been a positive development in the value delivered over time (Millen et al, 1997). There are also over 93 percent of respondents in Singapore and Malaysia indicated a positive development in the value through the use of contract logistics services (Bhatnagar et al, 1999; Sohail et al, 2003). According to Lieb (2005) value delivered by TPL providers to most of the American manufacturing companies continued to increase or stayed constant over time. This was the explanation for the high contract renewal rate in the TPL industry.

The same study made by Millen et al. (1997) also showed that over 60 percent of the respondents in Australia, USA and Western Europe would moderately increase their companies’ use of third party logistics services. The same result is also obtained from Singaporean
perspective with over 70 percent (Bhatnagar et al, 1999). Indian firms with over 80 percent would at least increase the outsourced logistics services moderately (Sahay & Mohan, 2006). Comparing with other countries, it shows the highest percentage (90%) of the respondent firms in Ghana, who would like to increase the use of third party logistics, services (Sohail et al, 2004).

So all in all, the conclusion drawn upon those studies indicate that there is a positive development regarding the outsourcing logistics activities.

**2.4.4.2 Most significant developments in the TPL market during the past years**

In the 2003 survey in USA (Lieb & Bentz, 2004) respondents mentioned a development of continued consolidation of the industry, the improvement of the IT solutions being offered by 3PL providers, the broadening of the service offerings provided by individual 3PL companies and the emergence of increased competition. Continuing financial pressures on the transportation industries and broader acceptance of the 3PL concept were also cited.
3 Methodology

This chapter, as the methodology chapter, will examine different research methods, such as qualitative versus quantitative. The steps of the empirical study are presented and choices are argued for. The chapter ends up with a discussion regarding validity and reliability.

3.1 Qualitative versus Quantitative research methods

In order to answer the purpose of our study we had the choice of using a qualitative, quantitative approach.

According to Neuman (2006), all social researchers collect and analyze the empirical data systematically, and examine the patterns carefully to understand and explain social life. Qualitative and quantitative research differs in many ways. One of the differences between the two approaches comes from the nature of the data. Soft data, in the form of symbols, photos, impressions, words, sentences, photos and so forth, dictates different research strategies and data collection techniques than hard data in the form of numbers. Other differences are different assumptions about social life and different objectives. These differences can make tools used by the other research style inappropriate or irrelevant.

Referring to Punch (2000), qualitative research is conducted through intense and/or prolonged contact with a ‘field’ of life situation. According to Merriam (1994) the primary instrument used in qualitative research is people and observations. This is all filtered through the interviewers’ world view and lifestyles, perspectives and values. Qualitative method depends on the skills of the researcher as an interviewer in gathering data, and not on the instruments employed to gather and analyze or measure the data. (Jary & Jary, 1991)

Qualitative researchers often rely on interpretive or critical social science (Neuman, 2006). They apply “logic in practice” and follow a nonlinear research path. The researcher’s role is to gain a ‘holistic’ view of the context of study in the form of its logic, arrangements and its implicit and explicit rules. The captured data from the research is based on the perceptions of local actors ‘from the inside’ through a process of deep attentiveness, of empathetic understanding, and of suspending or ‘bracketing’ perceptions about the topics under discussion and analysis. Qualitative data can be defined as empirical information about the world, most of the time this means words (Punch, 2000). Those words can be assembled and broken into semiotic segments, so that the researcher is able to contrast, compare, analyze and bestow patterns upon them.

Furthermore, qualitative methods would require relatively few cases, in order to form links among the many contextualize attributes. They emphasize conducting detailed examinations of cases arise in the natural flow of social life. They try to present authentic interpretations which are sensitive so specific social-historical contexts (Neuman, 2006). We felt that this was in contrast to what we wanted to do with our study, so this is out of our interests.

As Brannick and Roch (1997) concluded, quantitative methods focus on the links among a number of defined and measurable attributes involving many cases. The aim of quantitative method is to classify features, count them, and construct statistical models in an attempt to explain what is observed.

Most quantitative researchers often rely on a positivist approach to social science. They apply “reconstructed logic” and follow a linear research path. Quantitative researchers em-
phasize measuring variables precisely and testing hypotheses that are linked to general causal explanations (Neuman, 2006).

Collection of data in quantitative approach includes a collection of closed-ended information, in contrasts to qualitative data which consists of open-ended information, and this method relies on the instruments employed to gather and analyze data (Punch, 2000).

Quantitative approaches stress objectivity and more “mechanical” techniques. The principles of replication, standardized methodological procedures, measure with numbers, analyzing data with statistics or mathematics, are often utilized (Neuman, 2006).

The key concept about quantitative data is quantity, and numbers are used to express quantity. Therefore quantitative data are numerical; they are information about the world, in the form of numbers, from either counting, or scaling, or both. Measurement turns the data into numbers, and its function is to help us make comparisons (Punch, 2000).

We are aiming to have an exploratory study about general understanding of TPL usage in Swedish manufacturing firms. A quantitative method would be more appropriate concerning our topic. On one hand, our point of view is that repeated quantitative study would guarantee greater generalization within our frame of research. We believe generalization is needed for a broader understanding of the subject. On the other hand, one of the goals of our study is to compare our results with the previous findings in other studies which have also been done in quantitative and measured in numbers, it gives us enough background to proceed with quantitative study method in our thesis.

3.2 The Empirical Component

TPL has been the subject of analysis and academic investigation in the United States since the late 1980s and early 1990s. Based on the initial survey originally designed by Lieb (1992), there have been different surveys carried out in different countries in order to investigate the situation of uses of TPLs services. The use of TPL has been assessed both in single studies (Bardi & Tracey, 1991; Maltz, 1993; Rabinovich et al., 1999; Steffi, 1990; Sink & Langley, 1997), and in annually repeated surveys (Armstrong, 2003; Langley et al., 1996, 1997; Langley et al 1998, 1999; Langley et al., 2000; Langley et al., 2001, 2002; Langley et al., 2003; Langley et al., 2004; Lieb & Peluso 1999; Lieb et al., 2000; Lieb & Kendrick, 2002; Lieb & Bentz, 2003, 2004; Lieb, 2000; Lieb & Randell 1996).

Those series of annual surveys conducted in the USA by Lieb and his colleagues (Lieb, 1992; Lieb et al., 1993; Lieb and Randall, 1996, Lieb and Miller, 2002; Lieb and Bentz 2004, 2005b) etc, are well-known examples. Those articles are served as the base where we build and develop our research. They have been mentioned in the chapter of frame of reference, we summarize them here as shown in the Table 3-1.
<table>
<thead>
<tr>
<th>Perspectives</th>
<th>Name of the Article</th>
<th>Name of the Author</th>
<th>Year of the publish</th>
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<tbody>
<tr>
<td><strong>Users’ perspective: Survey for individual country</strong></td>
<td>The use of TPLs services by large American manufacturers</td>
<td>Robert Lieb</td>
<td>1992</td>
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<td></td>
<td>Third party logistics usage by large Australian firms</td>
<td>Peter Dapiran, Robert Lieb &amp; Robert Millen</td>
<td>1996</td>
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<td></td>
<td>Third party logistics services: A Singapore perspective</td>
<td>Rohit Bhatnagar, Amrik S. Sohal &amp; Robert Millen</td>
<td>1999</td>
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<td></td>
<td>The use of TPL services by Large American Manufacturers: The 2004 Survey</td>
<td>Robert Lieb &amp; Brooks A. Bentz</td>
<td>2004</td>
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<td></td>
<td>The usage of TPL in Saudi Arabia</td>
<td>Mohammed Sadiq Sohail, Obaid Saad Al- Abdali</td>
<td>2005</td>
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<tr>
<td></td>
<td>3PL practices: an Indian perspective</td>
<td>B.S.Sahay &amp; Ramneesh Mohan</td>
<td>2006</td>
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*Table 3-1: TPL articles made in other countries*
The literature we used as our research reference focuses on the demand-side of TPL, except for the last one which is studied from the TPL service providers’ perspective. Studies have been done across from the 1990s to the beginning of 2000; this is one way to prove that the method inherited from Lieb (1992) has been highly accepted and a recognized world wide method for this type of research. This also proves that it is the appropriate way to go about in order to find out the usage of TPLs service in Sweden. In general, most of the previous articles address similar purpose of study as the focus and scope of this thesis.

Based on the relevant literature review as mentioned some other theoretical studies which served as additional issues regarding third party logistics than the previous literatures, our own research study would be a purely exploratory survey. As such, the study is not aiming at testing theory or hypothesizing with statistics or problem solving for specific issue. The goal with the empirical study was to collect relevant data from the 350 biggest manufacturing firms in Sweden regarding their current use of Third party logistics and future estimated usage, further, the issues regarding the supply chain will also be brought up and studied by the data collected.

### 3.3 Different Steps of the Study

In our research study was performed in a sequential stepped scheme as indicated in the following components, which was also demonstrated in figure3-1(Brannick & Roche, 1997)

1. Dependency on existing similar studies - we went through all the previous studies and found data about usage of third party logistics in different countries carried out by different authors at different time. The purpose of the other studies is corresponding to the purpose of our thesis. This means what we represented the already done research within the subject and also other relevant studies in third party logistics.

2. Reference to additional theoretical studies – Due to the close connection between third party logistics providers and supply chain management concepts, apart from the previous studies, we also look into the area of supply chain management and supply chain integration. The study is also concerning to include the issues of supply chain perspective into our questionnaire design to look at the relation between the third party logistics and the supply chain management

3. The timing and specification of the research questions - departing from previous literature and theoretical studies regarding TPL and supply chain, the theoretical framework served as the basis for the development of the questions we wanted to look closer at and include in our survey.

4. First revision to the questionnaire- The issues under questionnaire were mainly developed by us with the great assistance and guidance from Lianguang Cui for the first draft designed questionnaire, it was handed to him for the first review, which resulted in alterations to the questionnaire. The revision to the questionnaire were mainly based on the probability of getting the response, and the proper time needed to fill it, since the respondents’ concentration to the questionnaire is depending substantially on the wording and content of it.

5. Pilot study of the revised questionnaire- Besides the acceptance from the academic point of view, in order to make sure the questionnaire is understood well and easily
handled by the logistics managers in different companies in practice, a pilot testing is carried out.

According to Cooper & Schindler (2003), a pilot testing is conducted to detect weaknesses in design and instrumentation and to provide proxy data for selection of a probability sample. Therefore, it should draw subjects from the target population and simulate the procedures and protocols that have been designated for data collection. In order to do so, we sent the questionnaire to three companies by email, from which a basic feedback regarding the time needed and comprehension of the survey was obtained from the logistics managers after one day. One of the managers had no question at all towards the comprehension, the time required to answer the survey was within 10 minutes which was a satisfactory timing. Regarding the number of choices for the optional questions, the other manager suggested including three selections on the choice rather than two selections, since in most of the cases in practice, for example question 11, he suggested that it was more practical to involve more than two departments. He also raised the question about SNI code which had been included as one of the attributes under General Company information, since in reality, normally this kind of information is out of logistics managers’ knowledge, and it takes time for the logistics manager to find out, then it will increase the length of time to fill in the whole questionnaire survey.

6. The collection of quantitative empirical evidence (available respondents) – at the same time with the first revision of our questionnaire, we contacted through telephone calls to the logistics managers or who are responsible for the logistics activities from those 350 companies that we found appropriate for our study.

7. The collection of quantitative empirical data – We allow all the companies two weeks to send us back the questionnaire

8. Exploratory analysis – Collected data was input to the statistics software for analysis and comparison with other countries’ TPL studies

Figure 3-1: The steps taken in the empirical component of the project.
3.4 Choice of population

We strategically chose the companies to investigate in this study. The choice of population in this research study was based on the following criteria:

1. Target population size should be around 350 which are the biggest companies can be achieved according to employment size, due to data collection method and availability of resources.

In the study carried out for USA, the population is with 500 manufacturing firms. Considering both the geography and population sizes for Sweden and USA, Sweden is relatively small country, so population of 350 is believed well enough to be studied.

Changed to:

Due to the restriction of time and expense dispensed from the logistics department, we select the 350 biggest companies as our target studied population, according to the employment size.

2. Those companies should all be manufacturing firms in Sweden, which is defined to be in line with the serial studies carried out by Lieb in USA.

3. In order to achieve the population, the selection criteria of employees should be more than 140 employees, from which the top 350 firms will be chosen.

In order to obtain qualified population with complete different information, an official electronic database called Affarsdata is used for the selection of the companies. Affarsdata presented us with information regarding, company name, address, telephone number, number of employees, and annual turnover. More specifically, the companies from manufacturing industry are achieved through SNI-code. SNI-code is the Swedish Industrial Classification code which is based on EU’s recommended standard, NACE which stands for “Nomenclature Generale des Activites Economiques dans l’Union Europeenne”. This is a general name for economic activities in the European Union) (EU Competition Law Online, 2007). It is primary an activity classification. Production units as companies and local units are classified after the activity which is carried out. One company or a local unit can have several activities (SNI-codes). With reference to EDD (2007), and SNI-code suggested from the usage of previous projects in the field we identified the manufacturing industries to a list of SNI- codes. The different industries are categorized and listed in detail as shown in Appendix 1…

According to the above criteria, 350 biggest companies in terms of number of employees were chosen as our target population. To get a higher response rate to the questionnaire all 350 companies were contacted in person by telephone prior to the questionnaire being sent out. We asked the logistical manager whether they were interested in participating in our questionnaire survey. We asked for the name and verified the address from those logistics managers who answered that they would like to participate or that said they would have a look at our questionnaire first, and then decide to join in or not. They were also required to fill in the questionnaire and return the letters within two weeks after they received the mail.

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1 SNI: It is the Swedish Industrial Classification code which is based on EU’s recommended standard, NACE. It is primary an activity classification. (http://www.scb.se/templates/Listning2____35025.asp, 2007)
3.5 Survey type

After deciding our research method of quantitative method, the next step is to choose the type of data collection method. Surveys can be performed in different ways. In order to obtain the effective data, we would choose the mail questionnaire to collect quantitative data.

The mail questionnaire allows for greater flexibility towards our respondents. It allows them to think about and answer the questions in certain period of time. The mail questionnaire will also be able to cover a greater geographic area. Other advantages include rapid and secured data collection along with the exclusion of the possibility for respondent coaching (Cooper & Schindler, 2003).

Further consideration about the expenditure regarding the mail survey is sponsored by the center of logistics and supply chain management from the Jonkoping International Business School, and it is a favored research method agreed by the research team. This survey method is then carried out.

3.6 Survey Instrument

In this chapter the main research issues will be transformed into specific questions for the purpose of conducting the survey. With reference to the previous literature studies, the overall research issue is to study the utilization of TPL services in Sweden. This general issue will be broken down into small sets of more specific research issues that will generate specific questions. The issue of supply chain management perspective will be paid attention as well, since it is one area that is receiving a lot of attention from logistics providers, consultants, researchers etc nowadays.

By comparing with other previous studies carried out in other countries as mentioned in the part of Literature Review, and thorough consideration, we build our research issues regarding the TPL usage as following:

- Extent of use of the third party logistics services
- Decision making process
- Organizational impacts
- Third party logistics services used
- Plans for future

Externally, as mentioned above, one more extra issue is:

- Third party logistics in a supply chain management perspective

3.7 Survey design

The survey starts with a simple definition of Third Party Logistics:

“A third party logistics provider is a logistics company which is external and provides logistical services to the user company.”
It provides the basic concept to the logistics managers in order to avoid the misunderstanding of the definition.

The first part of the survey is the general information about the respondents which includes ‘number of employees’ and number of employees in logistical department. It is served as the implication whether the size of different companies utilize the third party logistics services different.

To make the survey questionnaire precisely simple and short, most questions are designed with selection from available choices, that is, we exclude questions which require long time for respondents to think about and write down their own answers. In some questions, we combine two types of questionnaire into one question. For instance, in question number 25, we do not only provide respondents with the listed services to choose from, the satisfaction level for their used services is also provided to evaluate.

**Extent of use of the third party logistics services**

Respondents were differentiated through the first question; we identify four groups of respondents which correspondingly are: the current users, non-users who used to use it before, non-users who do not use TPL services, but consider using it in the future, non-users who even do not consider using it in the future. By differentiating the respondents in this first question, they will be directed to corresponding questions in the later questionnaire which they can answer and provide us relevant information. The detailed answerable questions are designed in the brackets following the different groups. For instance, for the last group of respondents, we limit them to answer the questions only number16, 29, 30, 31 and 33, so that we know what prevent them to consider to use TPL services (question16), 29 is served to know maybe there might be other service they want to acquire. 31 and 33 is just external information about their awareness for the usage of TPL services about the other actors in their supply chain.

All the other sub-questions are raised in order to see their extent of TPL services usage in terms of

- The number of TPL services providers the company uses;
- The length of TPL has been used;
- Average duration of the contract;

  With its sub issues: The most important criteria to determine the renewal of TPL contracts;

  Whether there is incentive about performance levels and penalties for non-performance.

- The extent committed to the usage of TPL providers;
- Percentage of total logistics budget allocated to the TPL providers.

**Decision making process**

Issues about where in the organization the decision is made in the beginning:
• At which organizational level is involved in the decision making regarding the usage of TPL services;

• At which functional areas are involved.

Considering there might be more than one functional area is involved, this question is designed as the multi-optional choices with other option could be defined by the respondent, which we did not include in our survey question.

After identifying those two issues, questions about through which information sources that the respondents become aware of the TPL services.

Issues below are also addressed in the questionnaire to see the impact factors, the importance of those factors correspondingly on the decision to outsource and evaluation criteria:

• The importance of the factors have impact on the decision to outsource logistics activities;

• The degree of the criteria used in evaluating TPL service providers;

• What major logistical performance measures are used as quantitative measures in evaluating a TPL service provider?

Organizational Impacts

With an understanding about the decision making process, the impacts of the usage of TPL services on the organization are discussed with the issues regarding the concerns, reasons for the usage and implementation of TPL services and overall impact of the usage of TPL services on the company.

• The major concerns and reservations about TPL usage and implementation;

• The major reasons for using TPL services;

• The impact of usage of TPL services on the company.

The other issues concerning the organizational impact are also raised, such as the change of the value delivered by the TPL; employee moral and retraining.

• The value delivered by TPL providers changed over time;

• Whether there is elimination of any full time positions due to the implementation of TPL services; if so, how many has been eliminated;

• The method of dealing with displacement of logistics personnel after implementing TPL services;

• Whether there is any retraining needed after implementing TPL services, and the primary reasons for retraining.

Contract logistics services used

The services used by the respondents with the satisfaction level are offered under this section, this question can be checked once more under overall satisfaction level in the questionnaire in the next section. The issue about geographical coverage globally is concerned under this section as well.
Which of the TPL services are used and how to evaluate them?
Are the TPL services used for international or domestic purpose?
In which part of the world the TPL services are used?

Plans for the future

After considering the current services used, future plans are discussed. First, the question about overall satisfaction level is indicated, accordingly, whether there is any services not available in the market are investigated, further question about modification of the usage of TPL services in the future is raised to see whether there is a logic between satisfaction level and modification of the usage.

TPL in a supply chain perspective

This section is served as the users’ awareness of the supply chain effect including the supply chain management, and supply chain integration from in terms of the use of TPL service providers from the other actors in the chain. Questions related listed as:

- Do any of your suppliers use TPL services?
- Do any of your suppliers use the same TPL provider as you?
- Do any of your customers use TPL services?
- Do any of your customers use the same TPL providers as you?
- Which part of the chain influences your choice of TPL provider the most?
- Do you think your TPL providers are influencing your customers’ or suppliers’ usage of TPL services?
- Are you using any external company (4PL) to coordinate the different TPL firms that are used in the supply chain?

4PL is a more advanced term than 3PL in terms of the management of logistics activities of the customers; this is to be investigated to see this utilization level in Swedish firms.

3.8 Answering frequencies

For those contacted population 350 manufacturing companies, 46 were not willing to participate, due to different reasons. Some of them who might not be interested in doing it, some of them had no time, and small part of them were leaving their positions. So, out of 350, there were 304 letters posted to the logistics managers. In the end, we got 92 letters back, and two of them were returned letters due to the wrong address. It resulted that the response rate of 90 out of 350 which is 25.7 percent. This is also in line with the other studies, for instance, the respondents in USA was 131 out of 500 largest manufacturing firms with a response rate of 26 percent (Lieb, 1992). The response rate in India (Sahay & Mohan, 2006) was 26 percent and in Australia it was 27 percent (Dapiran et. al., 1996). The response rate however, is much higher than in Singapore which was only 12, 6 percent (Bhatnagar, et. al., 1999) and in Western Europe with a response rate of only 15 percent (Millen et al, 1997).
3.9 Validity and Reliability

Validity refers to the extent to which a test measures what is actually to be measured (Cooper and Schindler, 2003), that is, more specifically, whether the measured data actually measures what it intended to measure in order to answer the purpose of our thesis.

According to Thietart (2001), the main concerns with the validity are whether the measured data is relevant and precise, and the second is the extent to which we can generalize from those results.

In this thesis, it generally leads to the question of whether the questionnaire has measured the right variables compared to the purpose and were these questions asked in a satisfactory manner.

Firstly, our research is purely a quantitative study which is based on specific designated questionnaire; all the questions are served to answer our main purpose in the thesis. Secondly, as described in this methodology, all the steps we carried out for the data collection is proper and reasonable. The fulfilled response rate aligned with the other studies proves a satisfactory response rate.

According to Dyer and Wilkins (1991) validity are in general always debatable. Even certain precautions exist to reduce possible errors and biases, the question of validity remains. We have well understanding of this problem; therefore we are trying to minimize such errors and biases by appropriate conducting methods and achieve qualified data analysis. Our research is an exploratory study rather than a deep qualitative analysis; we make sure that our observations based on the well designed questionnaire and proper steps of questionnaire design in terms of both design and pilot study, will be on the right direction and appropriate, and we limited all the answered data achieved from the survey to only use them directly pertained to the purpose of our thesis.

Reliability means dependability or consistency. It suggests that the same result can be achieved under the identical or very similar conditions (Neuman, 2006). In a quantitative research, reliability normally refers to measurement reliability, which means that the numerical results produced by an indicator do not vary because of the characteristics of the measurement process or measurement instrument itself.

How to approach and perform the actual data collection step is also a source of the reliability of the respondents. It is essential that the right individual at the responding organization is found. In our study, all the respondents are the logistics managers, who were contacted by phone prior to sending the survey. This was a measure to ensure that the right type of individual in the companies was responsible for the response. The respondents were also promised confidentiality by us. The collected data, in many cases containing sensitive company specific information, is not accessible to any other persons than the research team. Further, the respondent companies are not named. The promised confidentiality made the respondents to give information in sensitive questions without fear of losing information. It is believed to have increased the response rate as well as the quality of the answers.

To summarize the short discussion on the validity and reliability of this thesis, several measures have been taken to make the method used proper.
3.10 Data analysis tool

The statistics program SPSS (Statistical Package for the Social Sciences) is used for data analysis. It is among the most widely used programs for statistical analysis in social science.

According to different questions in the questionnaire, those questions were designed as different variables; the answers in different questions were assigned with different numbers. For instance, for multiple question 12 ‘Through which information sources did you become aware of the TPL services?’ There are 5 given listed possible approaches which are Direct mail advertising, Sales Calls by Third Party representatives, Discussions with other logistical professionals, Sales contacts at a logistics conference, advertising in professional publications. Those 5 information sources are programmed as 5 variables. But except those given ones, the respondent might have different approaches, so one more variable ‘other’ is provided to input respondents’ different answers. The respondents can be categorized into 4 groups with 4 different answers. In the program, ‘0’ means who did not answer this question, ‘1’ means ‘yes’ which indicate that the respondent who use some of the given information sources, ‘2’ means the respondent did not use that information source. ‘99’ is assigned to those who are not applied to answer this question, for instance, those respondents who are non-users of TPL services and also do not plan to use it in the future, are not applied to answer this question.

After inputting all the data from the respondents, data is analyzed by the functions of ‘Frequency’ which shows the number of different groups of respondents and percentage of each group’s of respondents. Crosstabs function is used to see the cross tables of frequency of respondents in different categories from two questions. For instance, the frequency of different size of companies who has different number of TPL providers, see table 2 for reference.
4 Empirical Study and Analysis

This chapter, as the empirical chapter, will present the empirical findings obtained through the survey used in the study. This is presented in comparison to previous similar studies made in other countries.

4.1 Participants profile

The responding organizations represent a broad cross-section of the manufacturing industry in Sweden. 45.6 percent of the respondents have the employment characteristics ranging between 200-499 employees.

4.2 Present extent of usage of TPL services

Out of a total 90 usable responses, about 55.6 percent respondents indicated that their organizations use TPL services, while 44.4 percent do not currently outsource logistics functions to TPL service providers. Of the organizations not currently outsourcing logistics services, one firm indicated that they had done it before but no longer use TPL services. 13.3 percent of all respondents consider outsourcing to TPL service providers in the future while 30 percent do not consider doing in the future either. For an overview of how the answers were divided among the different firms by current employment rate see table 4-1.

<table>
<thead>
<tr>
<th>Current Employment in whole company</th>
<th>Outsourcing or not</th>
<th>Not outsourcing, but has done it before</th>
<th>Not outsourcing, but consider doing it in the future</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not answered</td>
<td>3 (3,3)</td>
<td>1 (1,1)</td>
<td>0</td>
<td>5(5,5)</td>
</tr>
<tr>
<td>&lt;200</td>
<td>3(3,3)</td>
<td>0</td>
<td>0</td>
<td>9(10,0)</td>
</tr>
<tr>
<td>200-499</td>
<td>23(25,6)</td>
<td>0</td>
<td>8(8,9)</td>
<td>41(45,6)</td>
</tr>
<tr>
<td>500-999</td>
<td>8(8,9)</td>
<td>0</td>
<td>3(3,3)</td>
<td>18(20,0)</td>
</tr>
<tr>
<td>1000-4999</td>
<td>9(10,0)</td>
<td>0</td>
<td>1(1,1)</td>
<td>13(14,4)</td>
</tr>
<tr>
<td>&gt;5000</td>
<td>4(4,4)</td>
<td>0</td>
<td>0</td>
<td>4(4,4)</td>
</tr>
<tr>
<td>Total</td>
<td>50 (55,6)</td>
<td>1 (1,1)</td>
<td>12 (13,3)</td>
<td>90</td>
</tr>
</tbody>
</table>

Table 4-1: Number of users and non-users in each category of organizational size (Percentage in parentheses)

Furthermore, of those organizations currently outsourcing logistics services, 61.4 percent indicate that their firms employed the services of more than one logistics service provider. Table 4-2 provides an analysis of the size of the firm based on employees with the number of TPL providers used.
Table 4-2: Number of TPL providers divided in the different ranges of employment groups (Percentage in parentheses)

The most frequent users are companies with 200-499 employees, approximately 45 percent of them employ TPL service providers it is most common to only use one TPL service provider. More than half of these companies employ up to 10 people in their own logistics department. Since this is the group of respondents which outsourced logistics to the greatest extent, it explains why they have fewer in house logistics employees (See Table 4-3).

Table 4-3: Number of Employees in Logistics Department (Percentage in parentheses)

4.2.1 Duration of use

The results of the survey shows that of those companies using TPL services most are relatively experienced with the concept of using TPL services with 70 percent of them doing so for more than 5 years. Table 4-4 shows how the other answers were spread. This show there is a long history in terms of usage which is also in similar to the study done in USA with 67 percent of users outsourced logistics services for more than 5 years (Lieb & Bentz, 2005) and Singapore with 72 percent (Bhatnagar et al, 1999).
### TPL usage period

<table>
<thead>
<tr>
<th>TPL usage period</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1 year</td>
<td>3</td>
<td>6.0</td>
</tr>
<tr>
<td>1-3 years</td>
<td>7</td>
<td>14.0</td>
</tr>
<tr>
<td>3-5 years</td>
<td>5</td>
<td>10.0</td>
</tr>
<tr>
<td>&gt;5 years</td>
<td>35</td>
<td>70.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>50</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Table 4-4: Period for which third-party logistics services have been utilized

#### 4.2.2 Commitment

The level of commitment to the usage of the TPL services shows that over two-thirds (70 percent) of the respondents, currently using the services of TPL service providers, indicate that their organizations’ commitment to the concept was “moderate” or “extensive” (see Table 4 - 5). While the remaining users indicated that their organizations’ commitment was “limited” or “very limited”.

Comparing with other countries, the commitment to the TPL providers in Sweden is higher than USA (Millen et al, 1997) and Australia (Millen et al, 1997). But it is similar to Western European firms. However, Singapore (Bhatnagar et al, 1999), Malaysia (Sohail & Sohal, 2003) and Ghana (Sohal, 2004) all have a higher commitment than Sweden.

### Extent

<table>
<thead>
<tr>
<th>Extent</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very limited</td>
<td>5</td>
<td>10.2</td>
</tr>
<tr>
<td>Limited</td>
<td>9</td>
<td>18.4</td>
</tr>
<tr>
<td>Moderate</td>
<td>19</td>
<td>38.8</td>
</tr>
<tr>
<td>Extensive</td>
<td>16</td>
<td>32.7</td>
</tr>
<tr>
<td>Not answered</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>50</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Table 4-5: To what extent is your company committed to the usage of TPL providers?

The degree of commitment is also reflected in the percentage of the total logistics budget allocated to the third-party providers as a proportion of the total cost of logistics function. Of the respondents, 24.5 percent had less than 20 percent of total logistics budget and 14.3 percent had 20-40 percent of their total logistics budget allocated to TPL service providers. Further, remaining 61.2 percent was between the ranges of 40-100%. These figures currently indicate a fairly high level of commitment to the use of TPL services in Sweden (See table 4-6).
<table>
<thead>
<tr>
<th>Allocated part</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-20%</td>
<td>12</td>
<td>24.5</td>
</tr>
<tr>
<td>20-40%</td>
<td>7</td>
<td>14.3</td>
</tr>
<tr>
<td>40-60%</td>
<td>14</td>
<td>28.6</td>
</tr>
<tr>
<td>60-80%</td>
<td>6</td>
<td>12.2</td>
</tr>
<tr>
<td>80-100%</td>
<td>10</td>
<td>20.4</td>
</tr>
<tr>
<td>Not answered</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>50</strong></td>
<td></td>
</tr>
</tbody>
</table>

Table 4-6: What is the percentage of the total logistics budget allocated to the TPL providers?

However, other countries have reported allocating lower percentage of budget to TPL services than Sweden. Our findings indicated rather equal allocation in different ranges of budget. In general, 60 percent of the users allocate more than 40 percent of budget to the TPL services. This is in line with the findings of level of commitment that most of the users are moderate and extensive committed to the use of TPL providers.

4.2.3 Contracts

Almost all (98 percent) of the respondents had signed contracts with their TPL service providers. From the result of contract duration long-term relationships are most common, the average duration of the used contracts are in 75 percent of the cases 1-3 years of duration. It shows the similar result as USA, Australia and Western Europe. However, Malaysian and Singaporean studies tend to have longer term relationships where contract duration is often over 5 years.

Of the contracts, almost two thirds of them included performance incentives and penalties for non-performance. Sweden shows a higher involvement of performance incentives in the contract with TPL providers than USA, Australia, Singapore, Malaysia, and Saudi Arabia.

The most popular performance measure is on time shipment which is applied in 85.5 percent of the cases, other performance levels are shipping errors (54.8 percent) and customer complaints (48.4). A more detailed view with all performance measure options and results are presented in Table 4-7.

<table>
<thead>
<tr>
<th>Performance measures</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>On-time shipment</td>
<td>53</td>
<td>85.5</td>
</tr>
<tr>
<td>Shipping errors</td>
<td>34</td>
<td>54.8</td>
</tr>
<tr>
<td>Customer complaints</td>
<td>30</td>
<td>48.4</td>
</tr>
<tr>
<td>Inventory accuracy</td>
<td>25</td>
<td>40.3</td>
</tr>
<tr>
<td>Number of SEK shipped</td>
<td>9</td>
<td>14.5</td>
</tr>
<tr>
<td>Total order cycle time</td>
<td>8</td>
<td>12.9</td>
</tr>
<tr>
<td>Fill rates</td>
<td>7</td>
<td>11.3</td>
</tr>
<tr>
<td>Backorders</td>
<td>6</td>
<td>9.7</td>
</tr>
<tr>
<td>Warehouse cycle time</td>
<td>5</td>
<td>8.1</td>
</tr>
<tr>
<td>Number of kg shipped</td>
<td>5</td>
<td>8.1</td>
</tr>
<tr>
<td>Stock outs</td>
<td>3</td>
<td>4.8</td>
</tr>
<tr>
<td>Other*</td>
<td>4</td>
<td>6.5</td>
</tr>
</tbody>
</table>

Table 4-7: Level of firms using various logistics performance.

*=Correct invoicing, cost/kg, product quality
Different with the other studies, our survey shows a result that on time shipment has been widely used in Sweden as one of the most important performance measures. The second most important one is shipping errors and customer complaints; inventory accuracy is also mentioned as an important indicator. Link to the TPL provider be aware of those findings (In conclusion)

The most important criteria used to determine if TPL contracts are renewed is cost considerations (63.3 percent), service considerations and reliability is mentioned as the other most important ones in Sweden. Those criteria have also been mentioned in USA studies (Lieb & Bentz, 2004) as the most important renewal criteria.

For further considerations see Table 4-8

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost considerations</td>
<td>31</td>
<td>63.3</td>
</tr>
<tr>
<td>Service considerations</td>
<td>27</td>
<td>55.1</td>
</tr>
<tr>
<td>Reliability</td>
<td>27</td>
<td>55.1</td>
</tr>
<tr>
<td>IT capability</td>
<td>3</td>
<td>6.1</td>
</tr>
</tbody>
</table>

Table 4-8: Which are the most important criteria used to determine if TPL contracts are renewed?

4.3 The Decision-Making Process

4.3.1 Involvement in decisions making process

Those surveyed were asked to indicate the organizational level at which the strategic decision to use TPL services originated within their company. The answer varied considerably among the users. While 36.5 percent indicated it originated at the corporate level, 34.9 percent traced it to the divisional level, and 28.6 percent said it began at the local level.

These findings, regarding at which organizational level decision to outsource to TPL, show a similar situation with previous studies made. Except for the results in the Western Europe and Saudi Arabia, where the decision was more likely to originate from a corporate level. In Sweden the results are evenly distributed among the choices, corporate-, divisional- and local level.

Managers in different functional areas are often involved in the decision to use TPL service providers. Typically, managers in several other functional areas were involved. The responses, summarized in Table 4-9, show that manufacturing, marketing and finance were involved in the decision process by more than one third of the firms. Some other important functional areas mentioned externally to the given choices are purchasing and supply chain departments. Like the other countries’ studies, different functional areas are included, most common being finance and marketing. However, in Sweden it shows that managers in manufacturing are the mostly involved. In USA and Western Europe information system managers are also mentioned, this is however not so important in Sweden.
Table 4 - 9: Level of involvement in which functional managers were/would be involved in decision making process.

* = Distribution center, Forwarder, global contract, material administration, purchasing, supply chain

<table>
<thead>
<tr>
<th>Functional area</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing</td>
<td>28</td>
<td>45,2</td>
</tr>
<tr>
<td>Finance</td>
<td>26</td>
<td>41,9</td>
</tr>
<tr>
<td>Marketing</td>
<td>26</td>
<td>41,9</td>
</tr>
<tr>
<td>Information System</td>
<td>18</td>
<td>29,0</td>
</tr>
<tr>
<td>Human resources</td>
<td>3</td>
<td>4,8</td>
</tr>
<tr>
<td>Other*</td>
<td>17</td>
<td>27,4</td>
</tr>
</tbody>
</table>

4.3.2 Source of information

A source is needed to be able to retrieve information, and be able to make decisions regarding outsourcing logistics. Those using TPL services became aware of the services of the company or companies they employ in a variety of ways. As presented in Table 4-10, the most common ways were discussions with other logistics professionals (56,7 percent) and sales calls by representatives of TPL firms (30,0 percent). In terms of the other mentioned ones by the respondents, seven of them mentioned that the long term relationships with TPL, it indicates that the relationships between the users and the TPL providers have already existed before the employment of the logistics managers. These findings are similar to studies made in Australia, USA, Western Europe, Singapore and Saudi Arabia (Sohail & Al-Abdali, 2005; Bhatnagar et al., 1999; Millen et al., 1997; Lieb & Randell, 1991, 1994, 1995, 1997; Millen et al., 1995, 1997).

<table>
<thead>
<tr>
<th>Information sources</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discussion with other logistics professionals</td>
<td>34</td>
<td>56,7</td>
</tr>
<tr>
<td>Sales calls by TPL representative</td>
<td>18</td>
<td>30,0</td>
</tr>
<tr>
<td>Sales contacts at logistics conference</td>
<td>5</td>
<td>8,3</td>
</tr>
<tr>
<td>Direct mail advertising</td>
<td>3</td>
<td>5,0</td>
</tr>
<tr>
<td>Advertising in professional publications</td>
<td>3</td>
<td>5,0</td>
</tr>
<tr>
<td>Others*</td>
<td>25</td>
<td>41,0</td>
</tr>
</tbody>
</table>

Table 4 - 10: Sources of information

* = Business relations, Swedish export council, history (long term relationships), seminars, customer demand

4.3.3 Important criteria

The decision to outsource the logistical operations to a TPL service provider is affected by several factors. To see which the most important factors are, they were all rated on a five-point Likert scale, with a score of 1 indicating “not important” and a score of 5 indicating “very important”. The response for this question is presented in table 4-11. Over two thirds of all users indicated improvement in customer satisfaction (73,0 percent, overall importance rating 4,2), enhanced flexibility (71,0 percent, overall importance rating 4,1) and reduction in logistics costs (69,8 percent overall importance rating 4,1) moderately important or very important reasons for outsourcing. Those three most important factors are al-
so found in a study made about Singapore (Bhanagar, 1999). In Sweden, about half of the users identify focus on core competencies (46,0 percent overall importance rating 3,2) and the access to expertise (53,9 overall importance rating 3,6) as important of very important in their rationale for outsourcing of logistics functions.

<table>
<thead>
<tr>
<th>Factors</th>
<th>Not important</th>
<th>Less important</th>
<th>Important</th>
<th>Moderately important</th>
<th>Very important</th>
<th>Total answered</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer satisfaction</td>
<td>0</td>
<td>2 (3,2)</td>
<td>12 (19,0)</td>
<td>20 (31,7)</td>
<td>26 (41,3)</td>
<td>60</td>
<td>4,2</td>
<td>0,9</td>
</tr>
<tr>
<td>Flexibility (customization)</td>
<td>0</td>
<td>1 (1,6)</td>
<td>15 (23,8)</td>
<td>20 (31,7)</td>
<td>25 (39,7)</td>
<td>61</td>
<td>4,1</td>
<td>0,8</td>
</tr>
<tr>
<td>Cost savings</td>
<td>0</td>
<td>2 (3,2)</td>
<td>15 (23,8)</td>
<td>20 (31,7)</td>
<td>24 (38,1)</td>
<td>61</td>
<td>4,1</td>
<td>0,9</td>
</tr>
<tr>
<td>Access to expertise</td>
<td>2 (3,2)</td>
<td>8 (12,7)</td>
<td>17 (27,0)</td>
<td>21 (33,3)</td>
<td>13 (20,6)</td>
<td>61</td>
<td>3,6</td>
<td>1,1</td>
</tr>
<tr>
<td>Productivity improvement</td>
<td>3 (4,8)</td>
<td>8 (12,7)</td>
<td>22 (34,9)</td>
<td>12 (19,0)</td>
<td>15 (23,8)</td>
<td>60</td>
<td>3,5</td>
<td>1,2</td>
</tr>
<tr>
<td>Focus on core business</td>
<td>2 (3,2)</td>
<td>15 (23,8)</td>
<td>15 (23,8)</td>
<td>13 (20,6)</td>
<td>16 (25,4)</td>
<td>61</td>
<td>3,4</td>
<td>1,2</td>
</tr>
<tr>
<td>Access to techniques</td>
<td>3 (4,8)</td>
<td>12 (19,0)</td>
<td>27 (42,9)</td>
<td>10 (15,9)</td>
<td>9 (14,3)</td>
<td>61</td>
<td>3,2</td>
<td>1,1</td>
</tr>
<tr>
<td>Employee moral</td>
<td>5 (7,9)</td>
<td>22 (34,9)</td>
<td>20 (31,7)</td>
<td>10 (15,9)</td>
<td>3 (4,8)</td>
<td>60</td>
<td>2,7</td>
<td>1,0</td>
</tr>
</tbody>
</table>

Table 4 - 11: Level of importance on outsourcing decision. (Percentage in parentheses)

Figure 4 - 1: Degree of importance when evaluating TPL service providers (Percentage in parentheses)
Table 4 - 12: Degree of importance when evaluating TPL service providers (Percentage in parentheses)

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Not important</th>
<th>Less important</th>
<th>Important</th>
<th>Moderately important</th>
<th>Very important</th>
<th>Total answered</th>
<th>Mean</th>
<th>Std. deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service quality</td>
<td>-</td>
<td>1(1,6)</td>
<td>2(3,2)</td>
<td>16(25,8)</td>
<td>42(67,7)</td>
<td>61,0</td>
<td>4,6</td>
<td>0,6</td>
</tr>
<tr>
<td>Reliability</td>
<td>-</td>
<td>-</td>
<td>6(9,7)</td>
<td>18(29,0)</td>
<td>37(59,7)</td>
<td>61,0</td>
<td>4,5</td>
<td>0,7</td>
</tr>
<tr>
<td>Cost savings</td>
<td>-</td>
<td>-</td>
<td>11(17,7)</td>
<td>26(41,9)</td>
<td>23(37,1)</td>
<td>60,0</td>
<td>4,2</td>
<td>0,7</td>
</tr>
<tr>
<td>Prior experience with TPL</td>
<td>-</td>
<td>7(11,3)</td>
<td>15(24,2)</td>
<td>26(41,9)</td>
<td>11(17,7)</td>
<td>59,0</td>
<td>3,7</td>
<td>0,9</td>
</tr>
<tr>
<td>Range of offered services</td>
<td>1(1,6)</td>
<td>9(14,5)</td>
<td>18(29,0)</td>
<td>19(30,6)</td>
<td>13(21,0)</td>
<td>60,0</td>
<td>3,6</td>
<td>1,0</td>
</tr>
<tr>
<td>Company reputation</td>
<td>1(1,6)</td>
<td>3(4,8)</td>
<td>28(45,2)</td>
<td>18(29,0)</td>
<td>9(14,5)</td>
<td>59,0</td>
<td>3,5</td>
<td>0,9</td>
</tr>
<tr>
<td>Information system compatibility</td>
<td>2(3,2)</td>
<td>8(12,9)</td>
<td>19(30,6)</td>
<td>16(25,8)</td>
<td>12(19,4)</td>
<td>57,0</td>
<td>3,5</td>
<td>1,1</td>
</tr>
<tr>
<td>Word of mouth</td>
<td>3(4,8)</td>
<td>11(17,7)</td>
<td>29(46,8)</td>
<td>13(21,0)</td>
<td>3(4,8)</td>
<td>59,0</td>
<td>3,0</td>
<td>0,9</td>
</tr>
</tbody>
</table>

4.4 Impacts, driving forces, concerns and benefits

4.4.1 Concerns

Implementing TPL services is often goes along with business reengineering which creates an environment of uncertainty. In many instances, when the possibility of outsourcing logistics activities is discussed initially, logistics managers are sometimes less than enthusiastic. Many of the respondents already using TPL and planning to use it in the future noted such concerns. The respondents were given a list of concerns and given the ability to choose 3 options. The results showed that the most concerns were the uncertainty of service levels and capabilities provided (46,7 percent), the concern for integrating information systems (43,5 percent), third parties lack of customer and product knowledge (41,9 percent) and the concern of loss of direct control of logistics activities (40,3 percent).

More than one third of the respondents who currently don’t and don’t consider using TPL service providers in the future, consider potential loss of direct control of logistics activities (40,7 percent), third parties lack of customer and product knowledge (37,0 percent), uncertainty about true cost of using a TPL firm (33,3 percent) as the major concerns.

4.4.2 Reasons for outsourcing

The survey questionnaire probed the respondents to report on the improvements they have had on specific business objectives related to logistics system performance.

Respondents reported obtaining multiple benefits, they were asked to rank the major reasons for using the service of TPL providers. The most important reason for outsourcing in Sweden is based on logistics cost reduction. It is also stated as a positive to very positive impact on the organization after implementing the TPL services. Approximate 70 percent of the respondents’ state that the use of the service providers has helped them reduce logistics cost, thereby reducing their costs servicing the customer. Of the respondents half of them aim to improve the logistics process. 41,3 percent want to use the TPL service pro-
providers so that they can focus on their core competencies and improve the customer service. Other reasons are reported in Table 4-13.

The same result that the cost reduction has been top ranked has been achieved from the other studies made in Australia, USA, Western Europe, Singapore, India, Malaysia and Saudi Arabia (Sohail & Al-Abdali, 2005; Bhatnagar et al., 1999; Millen et al., 1997; Lieb & Randell, 1994; Millen et al., 1995; Sahay & Mohan, 2006; Sohail & Sohal, 2003).

<table>
<thead>
<tr>
<th>Reasons</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logistics cost reduction</td>
<td>43</td>
<td>68.3</td>
</tr>
<tr>
<td>Improve the logistics process</td>
<td>32</td>
<td>50.8</td>
</tr>
<tr>
<td>Focus on core competence</td>
<td>26</td>
<td>41.3</td>
</tr>
<tr>
<td>Improving customer service</td>
<td>26</td>
<td>41.3</td>
</tr>
<tr>
<td>Reduction in capital investments</td>
<td>17</td>
<td>27.0</td>
</tr>
<tr>
<td>To develop supply chain partnerships</td>
<td>13</td>
<td>20.6</td>
</tr>
<tr>
<td>Productivity improvements</td>
<td>11</td>
<td>17.5</td>
</tr>
<tr>
<td>Imbibe more flexibility</td>
<td>7</td>
<td>11.1</td>
</tr>
<tr>
<td>Expansion to unfamiliar markets</td>
<td>6</td>
<td>9.5</td>
</tr>
<tr>
<td>Increase inventory turn</td>
<td>5</td>
<td>7.9</td>
</tr>
<tr>
<td>Company restructuring</td>
<td>4</td>
<td>6.3</td>
</tr>
<tr>
<td>Access to emerging technologies</td>
<td>4</td>
<td>6.3</td>
</tr>
<tr>
<td>Increase environmental awareness</td>
<td>3</td>
<td>4.8</td>
</tr>
<tr>
<td>Taking on new product lines</td>
<td>1</td>
<td>1.6</td>
</tr>
</tbody>
</table>

Table 4-13: What were/are/would be your major reasons for using TPL services?

4.4.3 Organizational impacts

Users of the services of TPL providers were asked to categorize the impact of the services to their business. The evaluation was done on a five-point Likert scale, with a score of 1 indicating a “very negative” and a score 5 indicating “very positive”. The responses to this question are provided in Table 4-14. It can be seen that around half of the users noted that the impact had been “positive” or “very positive” in terms of logistics costs (73.6 percent overall importance rating 3.7), customer satisfaction (69.4 percent overall importance rating 3.7) and logistics system performance (53.1 percent overall importance rating 3.5). There are 12, 2 percent of the respondents indicated a negative impact on customer satisfaction. These results show that people issues are critical factor to be considered in outsourcing of logistics functions.

However, 10.2 percent of the respondents indicated that TPL services had a negative impact on employee morale. The employee morale has been ranked as the lowest impact due to the implementation of TPL. This is also in line with the other studies. (Sohail & Al-Abdali, 2005; Millen et al., 1995, 1997; Millen et al., 1997; Sahay & Mohan, 2006; Sohail & Sohal, 2003; Lieb & Bentz, 2004)
### Displacement and training

The use of TPL services also led to the elimination of some full time logistics related positions. 67.3 percent of the respondents reported this. Of those firms that had eliminated logistics positions. On the issue of addressing the displaced personnel, 50 percent of the respondents reported transfers within their firm. 37.5 percent were transferred and employed by the contract firm, 18, and 8 percent of the employees were released from their employment or terminated, 43.8 percent reported early retirements as a solution.

In terms of the displacement of the logistics employees due to the TPL services implementation, most of the user respondents, more than 50 percent, reported that there is elimination of some full time positions in logistics which is in accordance with all the other studies (Sohail & Al-Abdali, 2005; Bhatnagar et al., 1999; Lieb & Randell, 1991, 1994, 1995; Millen et al., 1995; Sahay & Mohan, 2006; Sohail & Sohal, 2003).

For those displaced logistics employees, release of the employees from their position is the rarest case in Sweden, however, it is the opposite from the studies made in Australia (Millen et al, 1995, 1997). In USA, Western Europe, Malaysia and Saudi Arabia, it is most common to transfer employees within the company, and it is the same situation in Sweden. Offering early retirement is the second most popular method for the Swedish companies. This has not been reported in other studies. It might be one way to prove that Sweden have a better social welfare system in terms of early retirement benefits than the other countries where the studies had been carried out. According to statistics Sweden, in relation to (%) GDP, Sweden has been ranked on the top of the countries in terms of the social protection expenditure when compared with the other European countries, Iceland, Norway and Switzerland. (Expenditure for social protection continues to increase, 2007)

Because the introduction of TPL services into a company represents an important shift in the way which business is conducted, it might reasonably be assumed that related training would occur. However, only 26.5 percent of the respondents in Sweden indicated that there was a need for retraining employees. The primary focus of the retraining efforts has been on upgrading skills relating to use of computerized systems (61.5 percent) and familiarizing with logistics procedures and documentation (28.5 percent).

<table>
<thead>
<tr>
<th>Area</th>
<th>Very negative</th>
<th>Negative</th>
<th>No impact</th>
<th>Positive</th>
<th>Very positive</th>
<th>Total answered</th>
<th>Mean</th>
<th>Std. deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer satisfaction</td>
<td>0</td>
<td>6(12.2)</td>
<td>9(18.4)</td>
<td>29(59.2)</td>
<td>5(10.2)</td>
<td>49(100.0)</td>
<td>3.7</td>
<td>0.8</td>
</tr>
<tr>
<td>Logistics costs</td>
<td>1(2.0)</td>
<td>5(10.2)</td>
<td>7(14.3)</td>
<td>32(65.3)</td>
<td>4(8.2)</td>
<td>49(100.0)</td>
<td>3.7</td>
<td>0.9</td>
</tr>
<tr>
<td>Labor cost</td>
<td>0</td>
<td>1(2.0)</td>
<td>19(38.8)</td>
<td>25(51.0)</td>
<td>1(2.0)</td>
<td>46(93.9)</td>
<td>3.6</td>
<td>0.6</td>
</tr>
<tr>
<td>Logistics system performance</td>
<td>0</td>
<td>4(8.2)</td>
<td>16(32.7)</td>
<td>26(53.1)</td>
<td></td>
<td>48(98.0)</td>
<td>3.5</td>
<td>0.7</td>
</tr>
<tr>
<td>Capital asset</td>
<td>0</td>
<td>1(2.0)</td>
<td>31(63.3)</td>
<td>11(22.4)</td>
<td>3(6.1)</td>
<td>46(93.9)</td>
<td>3.4</td>
<td>0.6</td>
</tr>
<tr>
<td>Sales revenue</td>
<td>0</td>
<td>2(4.1)</td>
<td>29(59.2)</td>
<td>15(30.6)</td>
<td>1(2.0)</td>
<td>47(95.9)</td>
<td>3.3</td>
<td>0.6</td>
</tr>
<tr>
<td>Working capital</td>
<td>0</td>
<td>2(4.1)</td>
<td>30(61.2)</td>
<td>13(26.5)</td>
<td>1(2.0)</td>
<td>46(93.9)</td>
<td>3.3</td>
<td>0.6</td>
</tr>
<tr>
<td>Return on asset</td>
<td>0</td>
<td>1(2.0)</td>
<td>33(67.3)</td>
<td>11(22.4)</td>
<td>1(2.0)</td>
<td>46(94.9)</td>
<td>3.3</td>
<td>0.5</td>
</tr>
<tr>
<td>Production cost</td>
<td>0</td>
<td>1(2.0)</td>
<td>36(73.5)</td>
<td>8(16.3)</td>
<td>1(2.0)</td>
<td>46(93.9)</td>
<td>3.2</td>
<td>0.5</td>
</tr>
<tr>
<td>Employee moral</td>
<td>0</td>
<td>5(10.2)</td>
<td>35(71.4)</td>
<td>8(16.3)</td>
<td>1(2.0)</td>
<td>48(98.0)</td>
<td>3.1</td>
<td>0.5</td>
</tr>
</tbody>
</table>

Table 4-14: The companies’ impact due to TPL usage
However, in other studies, outsourcing logistics operations does not necessarily lead to a need to retrain logistics personnel (Sohail & Al-Abdali, 2005; Bhatnagar et al., 1999; Millen et al., 1995, 1997; Lieb & Randell, 1991, 1994, 2000; Sahay & Mohan, 2006; Sohail & Sohal, 2003). The primary focus of the retraining efforts has been on upgrading skills relating to use of computerized systems (61.5 percent) which is similar to Australia (Millen et al., 1995, 1997) and Saudi Arabia (Sohail & Al-Abdali, 2005). Familiarizing with logistics procedures and documentation (28.5 percent) is also mentioned as the reason for the retraining.

4.5 Contract logistics services used and the geography

4.5.1 Contract logistics services used

Companies use a wide range of TPL services as shown in Figure 4-2. The most popular logistics function to outsource is the freight forwarding service (91.8 percent). At least half of the companies also outsource tracking/tracing (62.2 percent), transportation management (61.2 percent), warehouse management (55.1 percent) and import/export operations (51.0 percent). In general it appears that most “hard asset” activities have been allocated to the TPL service providers. Consulting service for those who has used this service has been ranked with lowest satisfaction level in Sweden. It can imply the potential need for this area. The satisfaction level for transportation management is also very low, there might be improvements can be made in this aspect as well.

Most of the other countries have warehouse management/operations ranked as one of the top three TPL services (Millen et al., 1995, 1997a; Lieb & Randell, 1991, 1994, 1995; Millen et al., 1997b; Sohail et al., 2004), shipment consolidation is also one of the popular TPL services in several countries (Millen et al., 1995, 1997a; Lieb & Randell, 1991, 1994, 1995; Millen et al., 1997b; US 2003; Bhatnagar et al., 1999; Sohail & Sohal, 2003; Sohail & Al-Abdali, 2005).

![Figure 4-2: 25 Most frequently used contract services](image-url)
To find a potential unmet market and see the level of satisfaction in the different TPL services the logistics functions were evaluated on a four point scale, with the score of 1 indicating “very dissatisfied” and the score of 4 indicating “very satisfied”. The response to used TPL services and the level of satisfaction is presented in Figure 4-3. The figures are in general relatively even and the average rate of satisfaction is 2.9 this means the firms are overall satisfied with the TPL service providers. The service with the respondents were most satisfied with was customer spare parts and contract manufacturing, they both scored 3.3. The TPL service with the lowest satisfaction level was consulting services (2.3).

Figure 4-3: Satisfaction level with TPL services

4.5.2 Geography

About 72 percent of organizations in Sweden use TPL providers to perform both domestic and international operations. The other 10 percent use such services for domestic operations only and 18 percent use these for international operations only. Among the purely international users and those using TPL in both domestic and international operations, it is most common to TPL service providers in Western Europe. Further coverage is shown in Table 27.

Comparing with other countries, Sweden is on the top of the both domestic and international operations which are similar to the study in USA (Lieb & Bentz, 2004) and Western Europe (Millen et al, 1997).

Sweden is rather an export oriented country. More specifically, Sweden uses most of the international TPL services in Western Europe, Northern Europe.
4.6 Plans for the future

The focus under this section is on the companies’ future plans regarding the usage of third party logistics services, and whether firms are considering changes in the level and nature of their involvement with third party logistics services providers. Of the respondents who are currently using TPL services, 16 percent indicate that they are “very satisfied” with the performance of their contract services providers and 78 percent indicate they are “satisfied”. Only 6 percent of users who were “dissatisfied” and no firms indicated that they were “very dissatisfied” with the performance of the contract logistics firms. Hence, 94 percent of the respondents implied that the use of contract logistics services had been a positive development for their firm.

The respondents were asked how the value delivered by their TPL provider would change over time. 84 percent noted it would stay relatively constant over time and even consider it to increase over time.

All respondents were also asked whether they would like to have any TPL services that are currently not available in the market, most of them with 97, 7 percent indicated that they did not want to have any other services rather than the available ones. However 2 respondents who are also the users of TPL services indicated that they would like to have service which is currently not available in the market. One user mentioned as “Merge in transit”, it is indicated by the user that ‘true merge in transit where TPL can cross dock merge goods without stock keeping, though the TPLs claims that this service exists’, however the respondent has not seen it working in reality. The other one mentioned that he would like to have TPL partners who can handle cold chain transports in a better way.

When asked how they modify their use of TPL services if they were given complete responsibility to make this decision, for those who are currently using TPL services and
planning to use it in the future, 41.9 percent of them suggested moderate or substantial increase in the use of the contract services. 43.5 percent of them would not change the use of TPL services. Only 14.6 percent of them would like to moderately decrease or eliminate the use of TPL services.

For those respondents who are non-users even in the future, when asked how they would modify the use of TPL services if they were given complete responsibility to make the decision, there are 4 percent of them would like to substantially increase the use, and 28 percent would like to moderately increase the use of TPL services. This result might imply the decision of outsourcing logistics activities is not hold by the logistics manager.

All in all, Sweden is also one of the countries in which most of the manufacturing firms are satisfied and very satisfied with TPL services providers. So, same as all the other countries, it shows a positive development in value delivered through the use of contract logistics services. So given total responsibilities, most of the logistics managers in Swedish manufacturing companies wouldn’t change or consider to increase the use of TPL services. Comparing with the recent studies in USA (Lieb Randell, 2000, USA2001, 2002, 2003), Sweden is more likely to increase the TPL services whereby many firms in USA would like to moderately decrease the use of TPL services.

The two recommendations of services from the user respondents; “true merge in transit” and “cold chain transports” could be the implication for the potential development in the services provided by TPL providers.

4.7 TPL in supply chain perspective

32.2 percent of the companies know that their suppliers use TPL service providers. 15.6 percent state their suppliers do not. However, the greatest part (52.2 percent), over half of the respondents do not know if their suppliers are using any TPL service providers.

Of the recipients answering to having suppliers who use TPL services, 58.3 percent say they use the same TPL suppliers. 33.3 percent do not use the same, 8.3 percent of them do not know.

37.8 percent of the companies know that their customers use TPL service providers. 14.4 percent state their customers do not. However, the greatest part (46.7 percent), almost half of the respondents do not know if their customers are using any TPL service providers.

Of the recipients answering to having customers who use TPL services, 42.3 percent say they use the same TPL suppliers. 38.5 percent do not use the same, 19.2 percent of them do not know.

The respondents were asked which part of the supply chain influences the companies’ choice on TPL service provider the most. More than half (55.1) of the respondents state being more influenced by the customer, the supplier only controls in 10.2 percent of the cases and the situation of not being influenced is more common (32.7).

63 percent of the recipients think their TPL providers sometimes are influencing their customer’s usage of TPL services? 21.7 percent think it happens often to very often. The remaining 15.2 percent do not think it ever happens.
91.7 percent of the companies are not using any external company (4PL) to coordinate the different TPL firms that are used in the supply chain. Furthermore, 8.3 percent of the companies do.
5 Conclusions

5.1 Summary

The main objective of this thesis was to identify and describe how the Swedish manufacturing firms use third party logistics services. The study provides a substantial review of related literature concerning the construction of the survey, namely, the extent of use of the third party logistics services, the decision making process for the usage of TPL services, organizational impacts, contract logistics services used, plans for the future and the TPL in a supply chain perspective.

The results discussed in this paper present a clear picture of the current situation of TPL in Sweden. We have focused on presenting an interesting subset of data and comparing these to previous studies.

Most of users of TPL services in Sweden, like the users in other countries where the similar studies have been made, are satisfied with their current TPL providers and believe that this has led to positive developments within their organization. With a high satisfaction level of the services, a large number of firms are more likely to increase their usage of contract logistics services, and interestingly, the study also found that, given full responsibility to make decision in terms of modifying the use of TPL services, some of the non-users probably increase the use of TPL services.

In assessing the extent of use of the contract logistic services, we found that many Swedish firms have been utilizing the services of contract logistics providers for several years. Comparing with the other studies, Sweden is relatively more committed to the use of such services, it has been reported that a higher percentage of budget have been allocated to the TPL services.

The decision to utilize the contract logistics firms is almost equally originated at the corporate and divisional level. However, the idea from other functional areas will usually be involved in the decision to outsource. Like the other studies, the decision to outsource the logistics operations to a TPL service provider are mainly based on the customer satisfaction level, enhanced flexibility, and reduction in logistics costs.

In terms of concerns for the use of outsourcing logistics providers, uncertainty of service levels and capabilities, concern for integrating information systems, lack of customer and product knowledge and concern of loss of direct control of logistics activities are identified equally as the obstacles. Cost reduction has been ranked on the top, same as the other studies, has been referred as the most important reason for using TPL providers. Other main reasons are focusing on the core competencies and improving the customer service. In terms of the issue of displacement of employees, most of companies transfer the logistics employees within their companies, and many firms also reported early retirement as a solution which we gave an explanation that Sweden is a country with good social welfare system.

Sweden is rather an export oriented country, the serviced utilized are broad in terms of the ranges and the geographical coverage encompassed both local and international services.

Concerning the aspect of TPL in supply chain perspective, regarding the awareness of the TPL usage for the upstream of the supply chain, there are more than one thirds of the respondents know that their suppliers use TPL service providers, among whom there are
more than half of them use the same providers. For the downstream of the supply chain, there are more respondents know that their customers use TPL services than the number of respondents know that their suppliers use the TPL services, and among those respondents, the percentage of them who answered using the same TPL service providers is lower than the percentage of the respondents who answered using the same TPL service providers as the suppliers. So it is hard to conclude that the Swedish manufacturing firms utilize their TPL providers from perspective of supply chain management and integration, though among the users who know that whether the customers or the suppliers use the TPL services or use the same TPL services. The result also indicated that the use of TPL providers can somehow influence the choices of TPL providers for the users’ customers or suppliers. But it’s the customers or the downstream part of the supply chain influences the respondents’ choice of the TPL providers the most. Very few number of TPL providers have been using more advanced logistics services providers or 4PL providers to coordinate the different TPL firms along their supply chain.

As we have shown, TPL is, as in, 2007, a successful phenomenon; the buyers invariably seem to have few regrets about their outsourcing decision. This in itself is, of course, good news for the service providers, and adding that to the projected high growth rates of TLP market, and it can justify that the future looks bright for the TPL providers. The experience of the firms in this study also provides insights as to how to plan for implementation, for example, the need to educate the third party logistics services provider about the users’ requirements. There is potential development for the TPL market in terms of the TPL services and service quality.

5.2 Future studies

Third party logistics is not a new concept, but it is a new research area to study the usage of the TPL services for the manufacturing companies in Sweden, especially the manufacturing industry is identified as one of the main sources of the economy (Encyclopaedia Britannica, 2008). We found this to be especially interesting as the logistics function is never an isolated function to the other functions in the company and in the company’s supply chain. While working on this thesis we found that new issues begain surfacing, which are worth taking a closer look at: such as:

- Comparing the use of TPL services in terms of the size of the companies.
- Concerning the supply chain perspective, research can be done to investigate whether more benefits in sharing the same primary TPL providers with major customers and vendors than in using different TPL providers.
- Identifying who has more power in the supply chain concerning the use of TPL providers for the Swedish manufacturing companies.
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6 Appendices

Appendix 1: SNI codes

The following SNI codes were used to define the Swedish manufacturing industry

**Manufacture of food products and beverages**
- 15111 Livestock slaughtering
- 15112 Production and preserving of meat in cuts
- 15120 Production and preserving of poultry meat
- 15130 Production of meat and poultry meat products
- 15200 Processing and preserving of fish and fish products
- 15310 Processing and preserving of potatoes
- 15320 Manufacture of fruit and vegetable juice
- 15330 Processing and preserving of fruit and vegetables n.e.c.
- 15410 Manufacture of crude oils and fats
- 15420 Manufacture of refined oils and fats
- 15430 Manufacture of margarine and similar edible fats
- 15511 Cheese production
- 15512 Other dairy production
- 15520 Manufacture of ice cream
- 15611 Production of flour
- 15612 Manufacture of breakfast cereals, blended flour mixes and other prepared grain mill products
- 15620 Manufacture of starches and starch products
- 15710 Manufacture of prepared feeds for farm animals
- 15720 Manufacture of prepared pet foods
- 15810 Manufacture of bread; manufacture of fresh pastry goods and cakes
- 15821 Manufacture of crispbread
- 15822 Manufacture of biscuits and preserved pastry goods and cakes
- 15830 Manufacture of sugar
- 15841 Manufacture of sugar confectionery
- 15842 Manufacture of cocoa and chocolate confectionery
- 15850 Manufacture of macaroni, noodles, couscous and similar farinaceous products
- 15860 Processing of tea and coffee
- 15870 Manufacture of condiments and seasonings
- 15880 Manufacture of homogenised food preparations and dietetic food
- 15890 Manufacture of other food products n.e.c.
- 15910 Manufacture of distilled potable alcoholic beverages
- 15920 Production of ethyl alcohol from fermented materials
- 15930 Manufacture of wines
- 15940 Manufacture of cider and other fruit wines
- 15950 Manufacture of other non-distilled fermented beverages
- 15960 Manufacture of beer
- 15970 Manufacture of malt
- 15980 Production of mineral waters and soft drinks

**16000 Manufacture of tobacco products**
Reference list

Manufacture of textiles
17110 Preparation and spinning of cotton-type fibres
17120 Preparation and spinning of woollen-type fibres
17130 Preparation and spinning of worsted-type fibres
17140 Preparation and spinning of flax-type fibres
17150 Throwing and preparation of silk including from noils and throwing and texturing of synthetic or artificial filament yarns
17160 Manufacture of sewing threads
17170 Preparation and spinning of other textile fibres
17210 Cotton-type weaving
17220 Woollen-type weaving
17230 Worsted-type weaving
17240 Silk-type weaving
17250 Other textile weaving
17300 Finishing of textiles
17401 Manufacture of curtains
17402 Manufacture of bed linen and other linen goods
17403 Manufacture of tarps, tents, sails etc.
17510 Manufacture of carpets and rugs
17520 Manufacture of cordage, rope, twine and netting
17530 Manufacture of nonwovens and articles made from nonwovens, except apparel
17541 Manufacture of ribbon, trimmings and lace
17549 Manufacture of various other textiles n.e.c.
17600 Manufacture of knitted and crocheted fabrics
17710 Manufacture of knitted and crocheted hosiery
17720 Manufacture of knitted and crocheted pullovers, cardigans and similar articles

 Manufacture of wearing apparel; dressing and dyeing of fur
18100 Manufacture of leather clothes
18210 Manufacture of workwear
18221 Manufacture of other outerwear for men and boys
18222 Manufacture of other outerwear for women and girls
18231 Manufacture of shirts and other underwear for men and boys
18232 Manufacture of blouses and shirts for women and girls
18233 Manufacture of girdles, brassières, corsets etc.
18234 Manufacture of other underwear for women and girls
18240 Manufacture of other wearing apparel and accessories n.e.c.
18300 Dressing and dyeing of fur; manufacture of articles of fur

 Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear
19100 Tanning and dressing of leather
19200 Manufacture of luggage, handbags, and the like, saddlery and harness
19300 Manufacture of footwear

Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
20101 Sawmilling
20102 Planing of wood
20103 Impregnation of wood
20201 Manufacture of veneer sheets, plywood and laminboard
20202 Manufacture of particle board
20301 Manufacture of prefabricated wooden buildings
20302 Manufacture of other builders' carpentry and joinery
20400 Manufacture of wooden containers
20510 Manufacture of other products of wood
20520 Manufacture of articles of cork, straw and plaiting materials

**Manufacture of pulp, paper and paper products**
21111 Manufacture of mechanical or semi-chemical pulp
21112 Manufacture of sulphate pulp
21113 Manufacture of sulphite pulp
21121 Manufacture of newsprint
21122 Manufacture of other printing paper
21123 Manufacture of kraft paper and paperboard
21129 Manufacture of other paper and paperboard
21211 Manufacture of corrugated paper and paperboard and corrugated board containers
21219 Manufacture of other containers of paper and paperboard
21220 Manufacture of household and sanitary goods and of toilet requisites
21230 Manufacture of paper stationery
21240 Manufacture of wallpaper
21250 Manufacture of other articles of paper and paperboard n.e.c.

**Manufacture of coke, refined petroleum products and nuclear fuel**
23100 Manufacture of coke oven products
23200 Manufacture of refined petroleum products
23300 Processing of nuclear fuel

**Manufacture of chemicals and chemical products**
24110 Manufacture of industrial gases
24120 Manufacture of dyes and pigments
24130 Manufacture of other inorganic basic chemicals
24140 Manufacture of other organic basic chemicals
24150 Manufacture of fertilizers and nitrogen compounds
24160 Manufacture of plastics in primary forms
24170 Manufacture of synthetic rubber in primary forms
24200 Manufacture of pesticides and other agro-chemical products
24300 Manufacture of paints, varnishes and similar coatings, printing ink and mastics
24410 Manufacture of basic pharmaceutical products
24420 Manufacture of pharmaceutical preparations
24510 Manufacture of soap and detergents, cleaning and polishing preparations
24520 Manufacture of perfumes and toilet preparations
24610 Manufacture of explosives
24620 Manufacture of glues and gelatines
24630 Manufacture of essential oils
24640 Manufacture of photographic chemical material
24650 Manufacture of prepared unrecorded media
24660 Manufacture of other chemical products n.e.c.
24700 Manufacture of man-made fibres
Manufacture of rubber and plastic products
25110 Manufacture of rubber tyres and tubes
25120 Retreading and rebuilding of rubber tyres
25130 Manufacture of other rubber products
25210 Manufacture of plastic plates, sheets, tubes and profiles
25220 Manufacture of plastic packing goods
25230 Manufacture of builders' ware of plastic
25240 Manufacture of other plastic products

Manufacture of other non-metallic mineral products
26110 Manufacture of flat glass
26120 Shaping and processing of flat glass
26131 Manufacture of bottles and glass containers
26132 Manufacture of other domestic glass wares
26140 Manufacture of glass fibres
26150 Manufacture and processing of other glass including technical
26210 Manufacture of ceramic household and ornamental articles
26220 Manufacture of ceramic sanitary fixtures
26230 Manufacture of ceramic insulators and insulating fittings
26240 Manufacture of other technical ceramic products
26250 Manufacture of other ceramic products
26260 Manufacture of refractory ceramic products
26300 Manufacture of ceramic tiles and flags
26400 Manufacture of bricks, tiles and construction products, in baked
26510 Manufacture of cement
26520 Manufacture of lime
26530 Manufacture of plaster
26611 Manufacture of light concrete products
26619 Manufacture of other concrete products for construction purposes
26620 Manufacture of plaster products for construction purposes
26630 Manufacture of ready-mixed concrete
26640 Manufacture of mortars
26650 Manufacture of fibre cement
26660 Manufacture of other articles of concrete, plaster and cement
26701 Cutting, shaping and finishing of building stone
26709 Cutting, shaping and finishing of ornamental stone 26810
26821 Manufacture of stone and mineral wool products
26829 Manufacture of various other non-metallic mineral products

Manufacture of basic metals
27100 Manufacture of basic iron and steel and of ferro-alloys 27210
27220 Manufacture of steel tubes
27310 Cold drawing
27320 Cold rolling of narrow strips
27330 Cold forming or folding
27340 Wire drawing
27410 Precious metals production
27420 Aluminium production
27430 Lead, zinc and tin production
27440 Copper production
27450 Other non-ferrous metal production
27510 Casting of iron
27520 Casting of steel
27530 Casting of light metals
27540 Casting of other non-ferrous metals

**Manufacture of fabricated metal products, except machinery**
28110 Manufacture of metal structures and parts of structures
28120 Manufacture of builders' carpentry and joinery of metal
28210 Manufacture of central heating radiators and boilers
28400 Forgiving, pressing, stamping and roll forming of metal; powder metallurgy
28510 Treatment and coating of metals
28520 General mechanical engineering
28610 Manufacture of cutlery
28621 Manufacture of shaping tools
28622 Manufacture of cutting tools
28629 Manufacture of other tools
28630 Manufacture of locks and hinges
28710 Manufacture of steel drums and similar containers
28720 Manufacture of light metal packaging
28730 Manufacture of wire products
28740 Manufacture of fasteners, screw machine products, chain and
28751 Manufacture of sinks, sanitary ware etc. of metal for construction
28759 Manufacture of various other fabricated metal products n.e.

**Manufacture of machinery and equipment n.e.c.**
29110 Manufacture of engines and turbines, except aircraft, vehicle and
29120 Manufacture of pumps and compressors
29130 Manufacture of taps and valves
29140 Manufacture of bearings, gears, gearing and driving elements
29210 Manufacture of furnaces and furnace burners
29220 Manufacture of lifting and handling equipment
29230 Manufacture of non-domestic cooling and ventilation equipment
29240 Manufacture of other general purpose machinery n.e.c.
29310 Manufacture of agricultural tractors
29320 Manufacture of other agricultural and forestry machinery
29410 Manufacture of portable hand held power tools
29420 Manufacture of other metalworking machine tools
29430 Manufacture of other machine tools n.e.c.
29510 Manufacture of machinery for metallurgy
29520 Manufacture of machinery for mining, quarrying and construction
29530 Manufacture of machinery for food, beverage and tobacco processing
29540 Manufacture of machinery for textile, apparel and leather production
29550 Manufacture of machinery for paper and paperboard production
29561 Manufacture of machinery for plastic and rubber processing
29569 Manufacture of various other special purpose machinery n.e.c. 29600
29711 Manufacture of refrigerators, freezers, washing machines and dishwashers
29719 Manufacture of other electric domestic appliances
29720 Manufacture of non-electric domestic appliances

**Manufacture of office machinery and computers**
30010 Manufacture of office machinery
30020 Manufacture of computers and other information processing equipment

**Manufacture of electrical machinery and apparatus n.e.c.**
31100 Manufacture of electric motors, generators and transformers
31200 Manufacture of electricity distribution and control apparatus
31300 Manufacture of insulated wire and cable
31400 Manufacture of accumulators, primary cells and primary batteries
31501 Manufacture of lamps and lighting fittings
31502 Manufacture of light bulbs and fluorescent tubes
31610 Manufacture of electrical equipment for engines and vehicles n.
31620 Manufacture of other electrical equipment n.e.c.

**Manufacture of radio, television and communication equipment**
32100 Manufacture of electronic valves and tubes and other electronic
32200 Manufacture of television and radio transmitters and apparatus for
32300 Manufacture of television and radio receivers, sound or video recording or repro-
ducing apparatus and associated goods

**Manufacture of medical, precision and optical instruments, watches**
33101 Manufacture of medical and surgical equipment and ortopaedic appliances except ar-
tifical teeth,
dentures etc.
33102 Manufacture of artificial teeth, dentures, dental plates etc.
33200 Manufacture of instruments and appliances for measuring, checking, testing, navigat-
ing and other
purposes, except industrial process control equipment
33300 Manufacture of industrial process control equipment
33400 Manufacture of optical instruments and photographic equipment
33500 Manufacture of watches and clocks

**Manufacture of motor vehicles, trailers and semi-trailers**
34100 Manufacture of motor vehicles
34200 Manufacture of bodies (coachwork) for motor vehicles; manufacture
34300 Manufacture of parts and accessories for motor vehicles and their

**Manufacture of other transport equipment**
35110 Building and repairing of ships
35120 Building and repairing of pleasure and sporting boats
35200 Manufacture of railway and tramway locomotives and rolling stock
35300 Manufacture of aircraft and spacecraft
35410 Manufacture of motorcycles
35420 Manufacture of bicycles
35430 Manufacture of invalid carriages
35500 Manufacture of other transport equipment n.e.c.
**Manufacture of furniture; manufacturing n.e.c.**

36110 Manufacture of chairs and seats
36120 Manufacture of other office and shop furniture
36130 Manufacture of other kitchen furniture
36140 Manufacture of other furniture
36150 Manufacture of mattresses
36210 Striking of coins
36220 Manufacture of jewellery and related articles n.e.c.
36300 Manufacture of musical instruments 36400
36500 Manufacture of games and toys
36610 Manufacture of imitation jewellery
36620 Manufacture of brooms and brushes
36630 Other manufacturing n.e.c.

(SCB, 2007)
Appendix 2: cover letter and survey

To whom it may concern,

Centre of Logistics and Supply Chain Management (CeLS) www.cels.se at Jönköping Intentional Business School (JIBS) www.jibs.se is currently conducting a research project about Third Party Logistics services usage. The purpose of the research project is to investigate the current usage of Third Party Logistics services in Swedish manufacturing companies. The research project is led by Professor Susanne Hertz, Head of CeLS and Ph.D Candidate Lianguang Cui. In addition, two master students in International Logistics and Supply Chain Management program from JIBS will be assisting.

To take part in this opportunity would we like you to fill in the attached survey and return it to us in the prepaid envelop before 15th November, 2007.

Your cooperation, accurate answers and on time response will be essential to the research project. In return for your contribution, we will present you with the possibility to access our research findings, which may be advantageous for your company in seeking new logistical possibilities. Research findings will be used for different academic purposes and your response will be maintained as anonymous and confidential.

Best Regards

Susanne Hertz  
Professor  
Head of CeLS

Lianguang Cui  
Ph.D Candidate

If you are interested in the survey result, you may leave your e-mail address here:
“A third party logistics provider is a logistics company which is external and provides logistical services to the user company”

For examples of TPL services please see question 25

**General Company information**

Number of total employees __________

Number of employees in logistical department __________

**Extent of use of the third party logistics services**

1. Do you use TPL services?
   - ☐ Yes
   - ☐ No, but we used to use it before. (Move to question 10)
   - ☐ No, but we consider using them in the future. (Move to question 10)
   - ☐ No, and we do not consider using it in the future. (Only answer question 16, 29, 30, 31, 33)

2. How many different TPL services providers does your company use?
   __________

3. How long is the period in which TPL has been used?
   - ☐ <1 year
   - ☐ 1-3 years
   - ☐ 3-5 years
   - ☐ >5 years

4. Are there any contracts made between your company and the TPL providers?
   - ☐ Yes
   - ☐ No (Move to question 8)

5. How long is the average duration of the contracts?
   - ☐ <1 year
   - ☐ 1-3 years
   - ☐ 3-5 years
   - ☐ >5 years
6. Which are the most important criteria used to determine if TPL contracts are renewed? (Choose max 2 options)

- Service considerations
- Cost considerations
- IT capability
- Reliability

7. Do your contracts include incentives about performance levels and penalties for none-performance?

- Yes
- No

8. To what extent is your company committed to the usage of TPL providers?

- Very Limited
- Limited
- Moderate
- Extensive

9. What is the percentage of the total logistics budget allocated to the TPL providers?

- 0-20%
- 20-40%
- 40-60%
- 60-80%
- 80-100%

**Decision making process**

10. Which organizational level was/would be involved in decision making regarding the usage of TPL services? (Choose 1 option)

- Corporate level
- Divisional level
- Local level

11. Which functional areas were/would be involved in the decision making regarding using TPL services? (Choose max 3 options)

- Finance
- Manufacturing
- Marketing
- Human resources
- Information System
- Other: ________________

12. Through which information sources did you become aware of the TPL services? (Choose max 2 options)

- Direct mail advertising
- Sales calls by third party representative
- Discussions with other logistical professionals
- Sales contacts at a logistics conference
- Advertising in professional publications
- Other: ____________________
13. What importance did/would the following factors have impact on the decision to outsource logistics activities?

<table>
<thead>
<tr>
<th>Factor</th>
<th>Not important</th>
<th>Less important</th>
<th>Important</th>
<th>Moderately important</th>
<th>Very important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexibility (customization)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost savings</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Focus on core business</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Customer satisfaction</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Employee moral</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Productivity improvement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access to techniques</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access to expertise</td>
<td></td>
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<td></td>
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<tr>
<td>Other</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

14. To what degree were/are/would the following criteria used in evaluating TPL service providers?

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Not important</th>
<th>Less important</th>
<th>Important</th>
<th>Moderately important</th>
<th>Very important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information system compatibility</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost savings</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service quality</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Company reputation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Range of offered services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prior experience with TPL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Word of mouth</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reliability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
15. What major logistical performance measures were/are/would be used as quantitative measures in evaluating a TPL service provider? (Choose max 4 options)

- On-time shipment
- Customer complaints
- Warehouse cycle time
- Number of kg shipped
- Inventory accuracy
- Total order cycle time
- Fill rates
- Number of SEK shipped
- Shipping errors
- Backorders
- Stock-outs
- Other:___________

**Organizational impacts**

16. What are your major concerns and reservations about TPL usage and implementation? (Choose max 4 options)

- Integrating information systems
- Maintain database integrity
- Job security
- True costs of using a TPL firm
- Lack of time
- Retraining of logistical personal
- Price negotiations
- Maintaining necessary level of commitment within company
- Difference in cultures, business requirements and systems
- Third parties lack of customer and product knowledge
- Loss of direct control of logistics activities
- Uncertainty of service levels and capabilities provided
- Other:______________________

17. What were/are/would be your major reasons for using TPL services? (Choose max 4 options)

- Logistics cost reduction
- Focus on core competence
- Expansion to unfamiliar markets
- Company restructuring
- Improving customer service
- Productivity improvements
- To increase inventory turn
- Imbibe more flexibility
- Access to emerging technologies
- Improve the logistics process
- To develop supply chain partnerships
- Reduction in capital investments
- Increased environmental awareness
- Taking on new product lines
- Other:______________________
18. What is the impact of usage of TPL services on your company?

<table>
<thead>
<tr>
<th>Impact</th>
<th>Very negative</th>
<th>Negative</th>
<th>No impact</th>
<th>Positive</th>
<th>Very positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logistics system performance</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Customer satisfaction</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Employee moral</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Sales revenue</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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</tr>
<tr>
<td>Working capital</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>Capital asset</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Production cost</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Labor cost</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Return on asset</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Logistics costs</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Other:_______________________</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

19. How has the value delivered by your TPL providers changed over time?

☐ Decreased over time
☐ Stayed relatively constant over time
☐ Continued to increase over time

20. Did you eliminate any full time positions due to the implementation of TPL services?

☐ Yes               ☐ No (Move to question 23)

21. How many full time positions have been eliminated due to the implementation of TPL services?

__________

22. How have you dealt with displacement of your logistics personnel due to the implementation of TPL services? (Choose max 2 options)

☐ Transfers within company   ☐ Transfer to contract logistics firms (TPL)
☐ Termination of employees   ☐ Early retirement
23. Has there been any retraining of logistical employees after implementing TPL?

☐ Yes
☐ No (Move to question 25)

24. What were the primary reasons for retraining? (Choose max 2 options)

☐ Upgrading skills relating to use of computerized systems
☐ Improving employees’ ability to adjust to new environment
☐ Amendments to operating process
☐ Familiarizing with logistics procedure and documentation

**Contract logistics services used**

25. Which of the following TPL services do you use, and how do you evaluate them?

<table>
<thead>
<tr>
<th>Service</th>
<th>Very dissatisfied</th>
<th>Dissatisfied</th>
<th>Satisfied</th>
<th>Very satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freight forwarding</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>Transportation management</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>Tracking/tracing</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>Cross docking</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Product assembly/installation</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Contract manufacturing</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Warehouse management</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Import/export operations</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Operation of IT systems</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Consulting services</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>Quality control</td>
<td>☐</td>
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<tr>
<td>Order management</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>After sales service</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>Reverse logistics/recycling</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Customer spare parts</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Purchasing of material</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Other: ____________________________</td>
<td>☐</td>
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</tr>
</tbody>
</table>
26. Are the TPL services used for international or domestic purpose?

☐ Pure international  ☐ Pure domestic  ☐ Both

27. In which part of the world do you use TPL services?

☐ North America
☐ South America
☐ Australia
☐ Western Europe
☐ Eastern Europe
☐ North Europe
☐ South Europe
☐ Asia, excluding China
☐ Africa
☐ China
**Plans for the future**

28. Overall how do you rate the performance of your current TPL providers?
   - □ Very dissatisfied
   - □ Dissatisfied
   - □ Satisfied
   - □ Very satisfied

29. Would you like to have any TPL services that are not available in the market?
   - □ No
   - □ Yes, Exemplify: ________________________________

30. How would you modify the use of TPL services if you were given complete responsibility to make this decision?
   - □ Eliminate use
   - □ Moderately decrease
   - □ No change
   - □ Moderately increase
   - □ Substantially increase

**TPL in a supply chain perspective**

31. Do any of your suppliers use TPL services?
   - □ Yes
   - □ No (Move to question 33)
   - □ I do not know
   - □ I don’t use TPL services (Move to question 33)

32. Do any of your suppliers use the same TPL provider as you?
   - □ Yes
   - □ No
   - □ I do not know
   - □ I don’t use TPL services

33. Do any of your customers use TPL services?
   - □ Yes
   - □ No (Move to question 35)
   - □ I do not know
   - □ I don’t use TPL services (Move to question 35)

34. Do any of your customers use the same TPL providers as you?
   - □ Yes
   - □ No
   - □ I do not know
   - □ I don’t use TPL services
35. Which part of the chain influences your choice of TPL provider the most?
☐ Supplier ☐ Customer ☐ No influence ☐ I don’t use TPL services

36. Do you think your TPL providers are influencing your customers’ or suppliers’ usage of TPL services?
☐ I don’t use TPL services
never sometimes often very often always
1 2 3 4 5
☐ ☐ ☐ ☐ ☐

37. Are you using any external company (4PL) to coordinate the different TPL firms that are used in the supply chain?
☐ Yes ☐ No ☐ No, I don’t use TPL services
### Appendix 3: data of TPL studies from different countries

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### Problems / Concerns

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Reservations/concerns

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- No

Concerns

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Important factor for final decision

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Appendix 11: data of TPL studies from different countries

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<td>Millen et al.</td>
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<table>
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<th>Percentage of positions eliminated</th>
<th>0-20%</th>
<th>21-40%</th>
<th>41-60%</th>
<th>61-80%</th>
<th>81-100%</th>
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### Appendix 12: data of TPL studies from different countries

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#### How to deal with displacement

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#### Was retraining necessary

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#### Which skills were needed to be trained

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## Appendix 13: data of TPL studies from different countries

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### Level of satisfaction

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### Level of value delivered over time

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### How respondents would modify their companies’ use of TPL if given complete responsibility for the decision

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