

# Logistics Collaboration between Shippers and Logistics Service Providers

*Observations in the Chemical Industry*

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## **Preface**

This report is the completion of the first phase of a larger research project. This larger project aims to analyze logistics collaboration decisions in more detail and consists of two phases. This interim report describes the results of the first phase. This first phase was initiated to better understand the research topic from both a practical and theoretical perspective. The results will be used to define and design the next steps in the project.

At this place I would like to thank all the people who were involved in this first phase for their support and suggestions. Especially, I would like to thank the interviewees for their time and willingness to share information and their experiences. Without their help reaching the research objectives would not have been possible.

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## Summary

### *Project objectives*

This study fits into a larger research project on logistics collaboration and outsourcing decisions. The final objective of this larger project is to analyze the logistics collaboration decision in more detail to identify thresholds in these decisions. To reach the overall objectives, the first step is to get a clearer picture on the chemical and logistics service providers industry, sectors of our study, and on logistics collaboration in these sectors. The results of this first phase are presented in this report.

### *Project Approach*

The study consists of two parts: literature review and five case studies within the chemical industry. The literature covers three topics: logistics collaboration, logistics outsourcing and purchasing of logistics services. The five case studies are used to refine the theoretical findings of the literature review.

### *Conclusions*

Main observations during the case studies can be summarized as follows:

- Most analyzed collaborative relationships between shippers and logistics service providers in the chemical industry are still focused on operational execution of logistics activities with a short term horizon. Supply management design and control are often retained by the shippers.
- Despite the time and cost intensive character of a logistics service buying process, shippers tendering on a very regular basis. The decision to start a new tender project should more often be based on an integral approach that includes all tender related costs. A lower frequency of tendering could create more stability in supply chains. Beside, it will give both, shippers and LSPs, the possibility to improve the quality of the remaining projects.
- Price is still a dominating decision criterion in selecting a LSP. This is not an issue as long as the comparison of costs is based on an integral approach, and when shippers balance the cost criterion within their total set of criteria for sourcing logistics services.
- At the shippers' side there is an increased awareness of the need of more solid collaboration with logistics service providers. Nevertheless, in many cases this increased awareness does not actually result in the required actions to establish more intensive collaboration.
- Over the last years the logistics service providers industry was characterized by low profit margins, strong fragmentation and price competition. Nowadays, the market for LSPs is changing, because of an increasing demand for logistics services. To benefit from this situation a more proactive role of the service providers is required in building stronger relationships with their customers. They should pay more attention on mid and long term possibilities in a collaborative relation, instead of only be focused on running the daily operation.

### *Next steps*

One of the next steps in the project is to analyze collaboration decisions in more detail by a second interview cycle. During this cycle decision behavior of individual respondents will be analyzed by proposing choices in the context of logistics collaboration. Each choice is described as a bundle of variables, which are expected to impact the interviewee's choice. The variables are analyzed in a quantitative way to reach the overall project objective.

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## **1. Introduction**

### **1.1 Research Background**

Globalization, technological innovation, shorter product life cycles and changing customer preferences have changed the general business environment. As a result, business processes become more specialized, and an increasing part of the value adding activities is placed outside the physical boundaries of a firm. These developments necessitate effective collaboration with other entities. The mentioned changing environment also influences the markets of shippers and logistics service providers (LSPs). Both parties are searching for competitive advantage by focusing on core businesses and efficiency. At the shippers' side logistics is often not identified as a core competence, and for that reason outsourced to specialized companies. In spite of the increased outsourcing activities towards logistics service providers; the market for LSPs is facing hard times. Since price level is the most important criterion in selecting an LSP, competition at price level increase and profit margins decrease. Therefore, service providers focus on efficiency by achieving economies of scale and scope. One way to reach such economies is collaboration. Therefore, for both LSPs and shippers the need for logistics collaboration increases. The potential benefits, in terms of costs and services, of logistics collaboration are proved by several (academic) studies. Despite the identified need and potential benefits, there are still barriers through which collaboration is not started or not successful. Fears about loss of control, problems to find a reliable partner and problems in maintaining customer's goodwill are some reasons for not seeking collaboration. As a result the potential benefits are not enhanced in practice.

### **1.2 Research Focus**

Collaboration is characterized by interaction between at least two parties. Therefore, this study incorporates the logistics service providers' as well as the shippers' perspective. At the shippers' side, the chemical industry is chosen as focus industry. We have chosen for one industry for two reasons. First, one focus industry is selected to support the in-depth character of this project. Second, one focus industry will give us better opportunities to compare the results. The chemical industry specifically is chosen for the following reasons.

- The chemical sector is a key contributor to both European and Dutch economy (E.R. 1; Hofmann & Budde, 2006).
- Line organizations in the chemical industry have identified supply chain collaboration between shippers and logistics service providers as one of the critical drivers for long term competitiveness of the industry (McKinnon, 2004; Roller et al, 2004).
- In contrary with some other sectors, the European chemical companies still have their production facilities located in Northern Europe.

### **1.3 Research Objectives**

The results presented in this report are part of a larger research project. The final objective of this larger research project is to analyze logistics collaboration decisions in more detail to identify thresholds in these decisions. It should provide in-depth insight in both rational and behavioral aspects that impact collaboration decisions between shippers and logistics service providers. At the end possible enablers should be identified to support professional organizations to cope with more successful collaboration decisions. To reach the overall objectives, the first step is to get a clearer picture on the sectors of our study, and to develop an understanding on logistics collaboration decisions in these sectors in more detail. Findings about these two items are presented in this report.

## **1.4 Research Approach**

This interim study exists of two parts: a literature review and five case studies. An extensive literature study is used to review earlier academic and business publications about the research topic. The literature review is followed by exploratory case studies. These case studies are used to refine the theoretical findings. Per case company recent collaboration projects are studied predominantly by means of semi-structured interviews and occasionally by means of company documents. Prior to the official interviews two pilot interviews are conducted to test the pre-defined questionnaire. In the period from March till August 2007 in total 21 interviews are carried out with representatives involved in the discussed projects. All respondents have a leading position in logistics, purchasing or general management. An overview of the interviewed persons can be found in appendix I. On request of some interviewees the results of the interviews are presented anonymous.

## **1.5 Report Structure**

The structure of this report follows the research approach as presented in the previous section. Chapter 2 describes the theoretical background of this project based on the results of the literature review. This background will be used to analyze collaboration projects during the case study research. Chapter 3 discusses the results of the sector analyses. Both chemical and logistics service providers' industry are described in more detail. Chapter 4 presents the case study results. Finally, in chapter 5 the main conclusions and avenues for further research are explained.

## 2. Theoretical Background

### 2.1 Logistics Collaboration

Traditionally, most firms are organized and viewed as independent and single entities which need to compete with others to survive. Nowadays, business processes become more specialized and an increasing part of the value adding activities is placed outside the physical boundaries of a firm. These developments necessitate collaboration with other entities important. As indicated in the previous section also logistics activities are more and more outsourced to specialized providers. These outsourcing results in logistics collaboration. Logistics collaboration can differ in form and intensity.

#### 2.1.1 Forms of Logistics Collaboration

In general, two forms of collaboration are distinguished: horizontal and vertical collaboration. Also both logistics service providers and shippers use both forms of collaboration. Horizontal collaboration is characterized by cooperation between (potential) competitors; parties at the same level(s) in the market. Vertical collaboration is defined as collaboration between parties that succeed each other in a particular generation process and therefore have different activities (Vries and Vaart, 2004). While horizontal and vertical collaboration are presented as two opposite concepts, recent business cases identify that both are combined in a lot of cases (Van der Ham et al., 2005). This is summarized in figure 1.

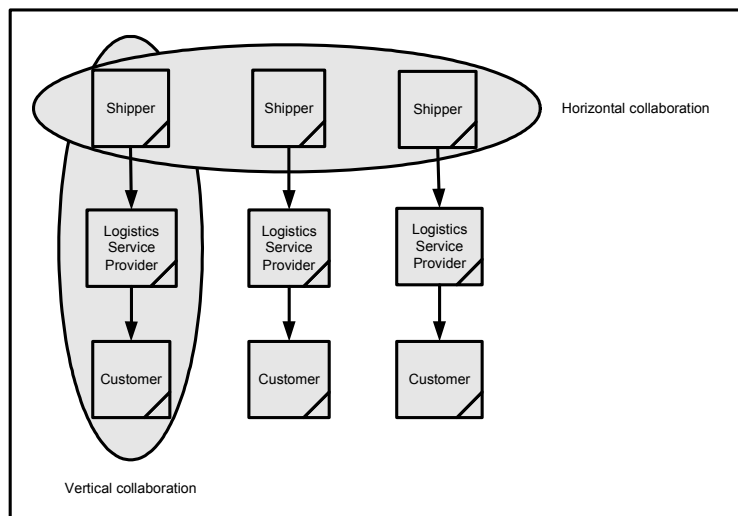


Figure 1: Horizontal and Vertical Collaboration Combined (Van der Ham et al., 2005)

#### 2.1.2 Intensity of Logistics Collaboration

Collaboration, both horizontal and vertical, results in inter-organizational relationships. These relationships can range from arm's length relationships to complete vertical integration of two or more organizations (Coyle et al, 2003; Lambert et al, 1996). These different relational perspectives are depicted in figure 2.

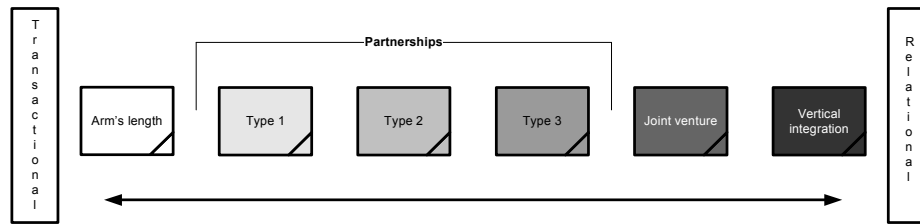


Figure 2: Relationships Perspectives (adapted from Lambert et al, 1996)

The figure above shows not only different types of inter-organizational relationships, but also different types of collaborative partnerships. Partnerships can differ in duration, strength and closeness. As a result three types of partnerships are distinguished (Lambert et al, 1996):

- Type 1: Operational partnership. Organizations recognize each other as partners and coordinate activities and planning on a limited base. The partnership usually has a short term focus and involves only one division of functional area within each organization.
- Type 2: Coordination partnership. Organizations progress beyond coordination of activities to integration of activities. Although the partnership is not expected to last “forever”, it has a long term horizon.
- Type 3: Strategic partnership. Organizations share a significant level of operational integration. Parties view the other(s) as an extension of their own firm. The partnership has a structural nature and therefore no “end-date” exists.

These three types of partnerships are used to define different types of logistics collaboration. Based on Vos et al. (2003) the type of logistics collaboration is determined by three related characteristics of logistics collaboration: scope, objective and horizon. The three types of logistics collaboration are:

- Type A: Operational collaboration: deploy activities more efficiently within the existing logistic structure. Partners collaborate at an operational level with a short term horizon.
- Type B: Coordination collaboration: achieve savings by coordination between parties. Partners exchange information and planning together with a mid term horizon.
- Type C: Network collaboration: accomplish structural savings as a result of restructuring of the shared logistic structure. Partners investing together. Collaboration has a long term horizon.

Figure 3 presents the relation between the type of logistics collaboration, and the three characteristics of collaboration.



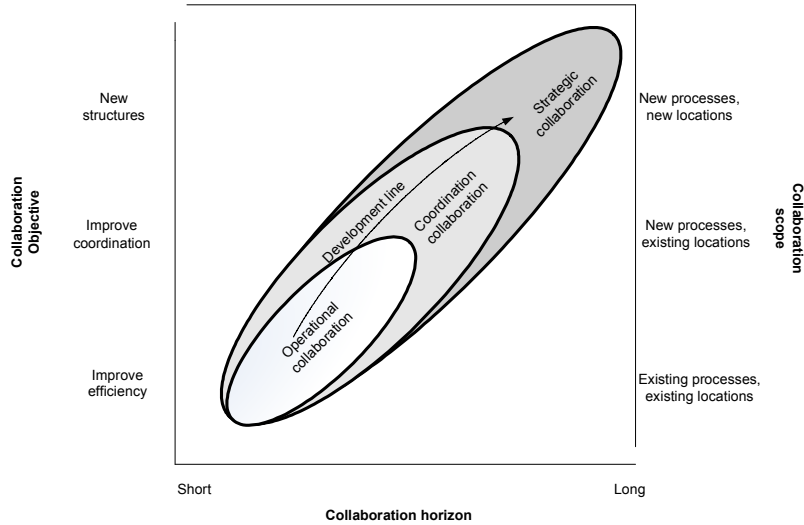


Figure 3: *Three Types of Logistics Collaboration (adapted from Vos et al, 2003)*

## 2.2 Outsourcing of Logistics Services

### 2.2.1 Outsourcing Logistics: Part of Business Strategy

Logistics collaboration is a result of a logistics outsourcing decisions. In our research we follow Razzaque and Sheng (1998) to define logistics outsourcing as the provision of single or multiple logistics services by a vendor on a contractual basis. The nature of the logistics services bought can be more or less complex. In this report we will use the term “advanced logistics services” for the more complex ones, and the term “basic logistics services” for the ones on the other end of the continuum (see figure 4) (Andersson and Norrman, 2002). What drives the degree of complexity are factors such as the number of services included (single or multiple bundled services); tangibility of the service definition; whether focus on execution of activities or management; and whether the service is pre-defined and stable or if development and re-engineering is part of the scope.

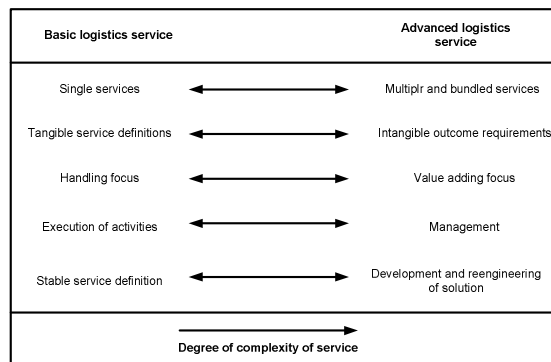


Figure 4: *Advanced versus Basic Logistics Services (Andersson and Normann, 2002)*

Recent empirical studies show that the primary focus is still on outsourcing basic logistics services. Table 1 depicts the results of a survey about logistics outsourcing in Europe (Eyefortransport, 2006).

This table show that basic services like, warehousing and transportation, are usually outsourced to external providers.

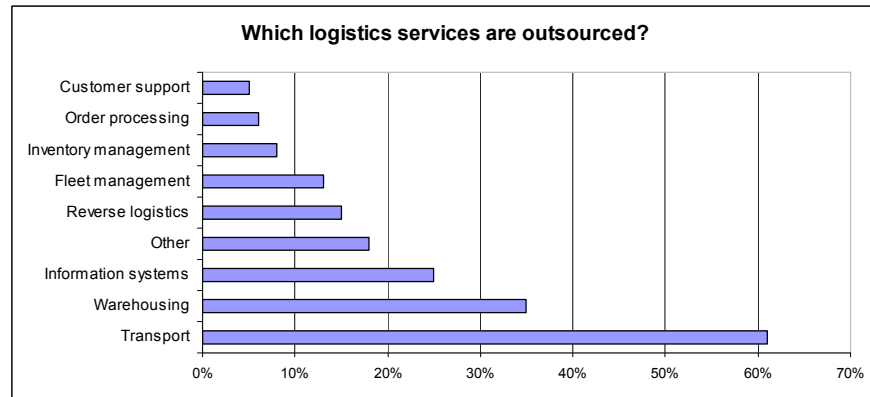


Table1x: Which Logistics Services are Outsourced? (Eyefortransport, 2006)

Logistics is one of the tasks that are increasingly defined as a non-core activity, and therefore outsourced to specialized providers. Nevertheless, from a business perspective, (logistics) outsourcing is never a goal to be reached; it is only a means to an end. Logistics decisions are results of the overall business strategy (Groothedde, 2005). Logistics decisions are not taken in isolation, but are aligned to other disciplines and departments of an organization. Based on the overall business strategy: customers, products, markets and service levels are defined. These choices result in a corresponding logistics strategy. Therefore, outsourcing can be one of the possible choices to achieve the companies overall objectives. The link between business and logistics strategy is shown in figure 5.

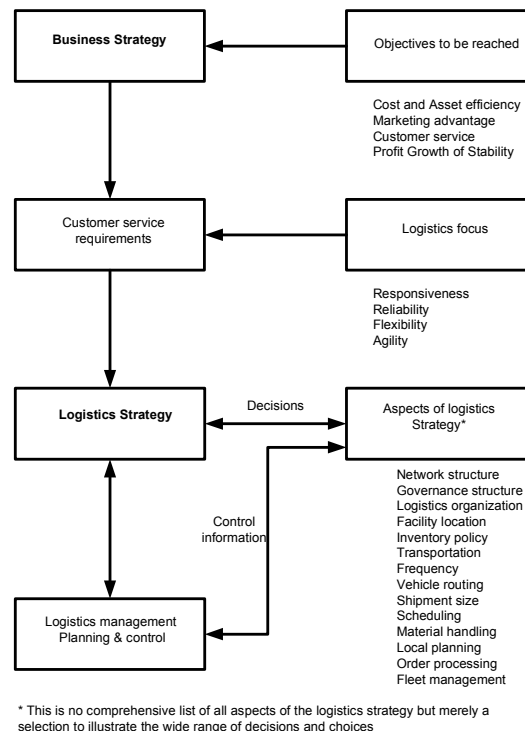


Figure 5: Business and Logistics Strategy (Groothedde, 2005)

### 2.2.2 Advantages and Disadvantages of Outsourcing Logistics

Much has been written in both popular press and academic literature about reasons of logistics outsourcing. An analysis of several contributions shows that cost reduction is the most common reason for outsourcing. This reason is often combined with service, flexibility, core competence and investment related reasons. These reasons are reflected in the identified advantages of logistics services. Advantages of logistics outsourcing are items like cost reduction, customer service improvement, and the possibility to concentrate on core competences. Just as there are many advantages of outsourcing logistics services; there are also disadvantages discouraging its utilization. Loss of control appears to be most commonly cited concern that inhibits firms from outsourcing logistics. An overview of some of the identified advantages and disadvantages is presented in table 2. According Van Tienen (1999), the advantages and disadvantages are categorized in three categories: strategic, financial, and operational.

	Advantages	Disadvantages
<b>Strategic</b>	<ul style="list-style-type: none"> <li>• Concentration on core competences</li> <li>• Access to specialized knowledge and capabilities</li> <li>• Faster entrance to new markets</li> <li>• Higher flexibility</li> </ul>	<ul style="list-style-type: none"> <li>• Dependence of a third party</li> <li>• Point of no return</li> <li>• Loss of specialized knowledge and competences</li> </ul>
<b>Financial</b>	<ul style="list-style-type: none"> <li>• Lower operational costs</li> <li>• Make cost variable</li> <li>• No investments in logistics assets</li> </ul>	<ul style="list-style-type: none"> <li>• Disinvestments</li> <li>• Switching cost</li> <li>• Transaction cost</li> </ul>
<b>Operational</b>	<ul style="list-style-type: none"> <li>• More efficient operation</li> <li>• More effective operation</li> <li>• Improvement of customer service level</li> </ul>	<ul style="list-style-type: none"> <li>• No direct contact with customer</li> <li>• Have less grip on quality</li> <li>• Additional effort needed to manage third party</li> <li>• Lack of expertise of a third party in a specific market</li> </ul>

Table 2: Potential Advantages and Disadvantages of Logistics Outsourcing

It needs to be noticed that the list of advantages and disadvantages is not comprehensive. The used categorization is also not exclusive. Advantages or disadvantages in a specific category are linked and influence advantages or disadvantages in another category. Beside, the relevance of the advantages and disadvantages differ case by case. They need to be evaluated carefully in each single outsourcing decision.

## 2.3 Purchasing Logistics Services

### 2.3.1 Purchasing Process

There is no difference between outsourcing logistical functions and any other procurement process. In general, a purchasing process contains steps such as: define specification, select supplier, contract agreement, ordering, expediting and evaluation (Van Weele, 1994). A number of logistical authors have defined similar processes for selection LSPs (Andersson and Norrman, 2002). An approach for buying logistics services is presented in figure 6.

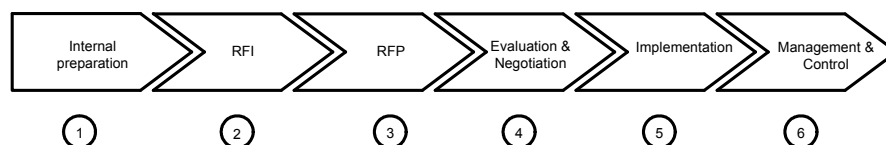


Figure 6: Purchasing Process Logistics Services

The presented buying process for logistics services consists of 6 steps or phases. The first step is the internal preparation to define and specify the services to be purchased. A detailed description of required services is needed to make clear what is expected so that a LSP can offer tailor-made services. This knowledge is also important for evaluating the tenders. At the end of this phase a requirement document, Request for Information (RFI), is available together with a longlist of potential providers. The second step is to send the RFI to the longlisted LSPs. Based on their provided response the potential suppliers are screened. The final objective of this phase is to reduce the number of providers to continue with. The third step is to send out a more detailed requirements document, Request for Proposal (RFP), to providers at the remaining short list. The RFP document should specify the requested services in more detail as well as the forecasted volumes. Often also the response format is designed in a RFP document so that suppliers have to fill in data in a standardized way that it makes it easy to analyze and compare the proposals. Afterwards the responses are evaluated using the selection criteria defined in the first step of the buying process. When offers are evaluated service providers are called for negotiations. At the end of the negotiation process a contract should be developed and signed. The fifth step is to implement the services as specified in the contract. After the implementation phase, the final phase of managing and controlling the contract is remaining. The management and controlling activities should not only be focused on the contracted service provider. The outsourcing firm itself constitutes the other critical half of a relationship, and it is equally important that its performance is being managed and measured as well.

Although the above presented model is described sequentially no linear path should be assumed. In some processes a phase may be omitted entirely, and interruptions and recycling throughout the stages are common. The time and effort involved in each step may vary depending on an organization's previous experience with outsourcing logistics and the kind of services purchased. In general, the selection process involves a high degree of communication and interaction between the buying team and suppliers personnel. Because of the time and cost intensive character of this kind of buying processes, it is recommended to differentiate logistics sourcing strategies based on the kind of logistics services are purchased.

### *2.3.2 Selection Criteria*

As discussed in the previous section, selection criteria used during the buying process should be established early in the process. These selection criteria need to encompass the strategic, tactical and operational requirements that are critical to the company. Therefore, these criteria will vary with the outsourcing firm's unique needs, as well as the functions that are outsourced. Nevertheless, there appears consensus in literature that any set of selection criteria should involve rational elements tempered by behavioral considerations (Andersson and Norrman, 2002; Lynch, 2004; Sink and Langley, 1997; Van Laarhoven and Sharman, 1994). Cost, quality, capacity and capabilities are traditionally used to evaluate providers. Nowadays, the market is more demanding and the services are more complex. As a result the list of selection criteria is extended with items like cultural compatibility, management commitment, financial stability, operating flexibility, and trust. Nevertheless, cost or price is still the most dominant selection criteria. Already in 1994 Van Laarhoven and Sharman investigated the third-party logistics use in Europe by conducting 70 in-depth interviews. They note that price is the most dominant selection criteria, and that European buyers use a hard negotiating approach involving competitive bids. These findings are confirmed by later research contributions (Laarhoven et al, 2000; Cap Gemini et al, 2005). Logistics collaboration can bring improvements in logistics cost and service, but too much emphasis on cost reduction in (re)negotiation and selecting a service provider actually inhibits a successful outcome. Therefore, cost or price level must be considered in the selection process, but it should not be the first and foremost consideration. Price should be a factor only in deciding among firms that meet all other criteria. In evaluating the pricing and costs of alternatives, buyers need to have an integrated approach to compare the cost of the different proposals. Not only the tariffs need to be evaluated, also possibilities

for future cost reduction, and the transaction and switching costs accompanying to a specific alternative need to be incorporated in the comparison.

The relation between shipper and service provider is a classic buyer-supplier relationship, where power and dependence are often imbalanced. Buyers ultimately control the relationships and tend to be several times larger than their service providers, there is always a tendency to revert to traditional “arm’s length” purchasing methods. Therefore, shippers should, especially in cases where the outsourced services are more complex, treat the outsourcing project as a supply chain issue and less as only a cost reduction project. They need focus on selecting a business partner, and not merely a contractor. Also the service providers have their own role and responsibilities in this process. They need to have the knowledge and capabilities to act as the required partner. They need to be competitive with other suppliers, but also have a long term horizon and price a proposal on their own cost, and not on what other charge or what it will take to close the deal.

## **2.4 Conclusions**

This chapter discussed different aspects of logistics collaboration and outsourcing. Logistics collaboration can differ in form and intensity. Logistics collaboration is a result of outsourcing logistics services. It is concluded that outsourcing of these services is not a means to an end. Outsourcing is part of the logistics strategy, which is based on the overall business strategy. Also advantages and disadvantages of logistics outsourcing are mentioned. This makes clear that organizations can expect to achieve success with outsourcing of logistics activities, but various aspects of the outsourcing process need to be considered cautiously. Therefore, outsourcing of any logistics function requires careful planning, selection, implementation and management based on a well structured process. The exact approach will depend on the specific situation and services outsourced.

### 3. Sector Analyses

#### 3.1 Chemical Sector

##### 3.1.1 Introduction to the Chemical Industry

From World War II till the seventies the chemical industry is characterized by continuous growth. However, in the eighties this growth stagnated by cause of the economic recession. The industry started to follow a diversification strategy to reduce uncertainty. This strategy changed in the nineties. Instead of diversification, the chemical firms focused on their core business to realize structural cost savings and improvements in productivity. This focus change was influenced by a lack of profitability, and a changing business environment. As a result, the end of the nineties and the beginning of the 21<sup>st</sup> century are characterized by a further focus on economies of scale, which has resulted in several mergers and acquisitions in the chemical industry.

Nowadays, the chemical sector is a key contributor to the Dutch economy. The national government subscribes this, and has identified the chemical industry as one of the core industries for the country (Van Tilburg and Bekker, 2004). In 2006, the sector has an annual turnover of 45 billion Euro, and generated 3% of the Dutch Gross National Product. Figure 7 depicts the turnover of the Dutch Chemical Industry over the last decade.

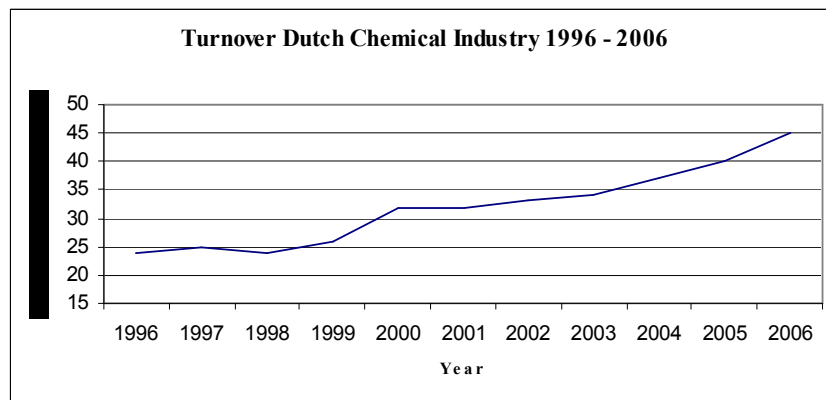


Figure 7: Turnover Dutch Chemical Industry 1996 – 2006 (E.R. 1)

Also from a European perspective the chemical industry is a key contributor of the economy. Throughout the EU, about 1.3 million people are employed in one of the 27,000 chemical companies and the industry provides further employment in a range of downstream industries.

The EU has one of the largest chemical blocks in the world, this is also presented in figure 8. In 2005, the EU accounted for almost 30 percent of total global chemical sales, worth 436 billion Euros. Almost half (13) of the 30 world chemicals majors had their headquarters in the EU - representing approximately 15% of world chemical sales (E.R. 2; Hofmann and Budde, 2006). This is a significant increase compared to the previous year and reflects not only the positive sales development in 2005 but also the ongoing consolidation in the chemicals sector.

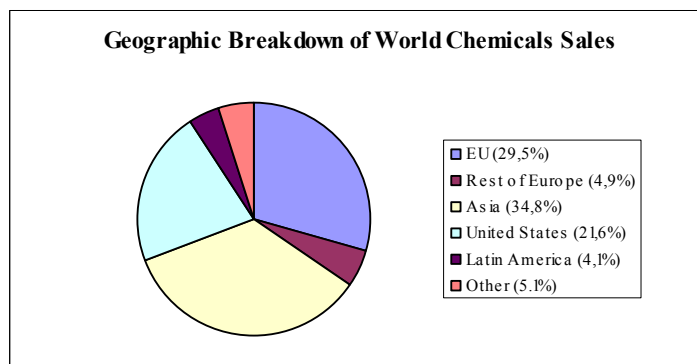


Figure 8: Geographic Breakdown of World Chemicals Sales (E.R. 2)

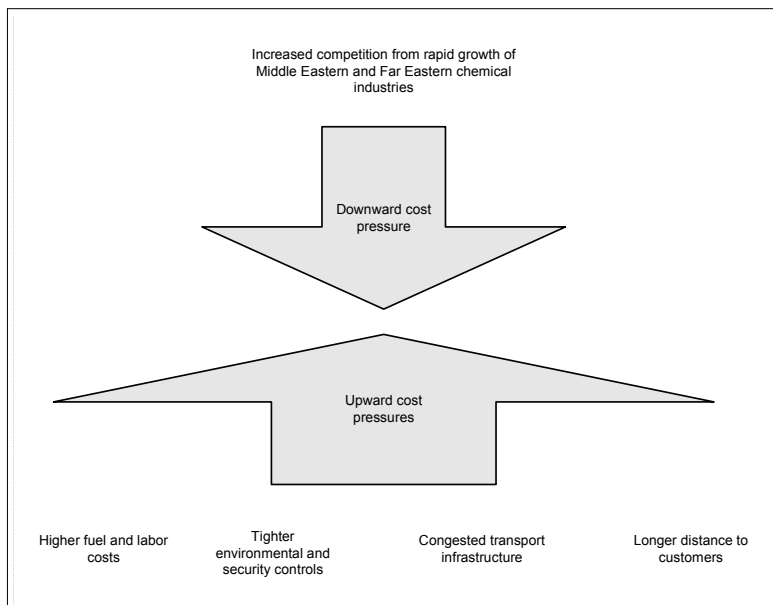
Safety and environment are main topics within the chemicals industry. Despite the attention and the fact that the chemicals industry is one of the most highly regulated industrial sectors, the public perception of the chemicals industry is not purely positive. This requires building trust by engaging in dialogue with those stakeholders shaping the environment: customers, regulators, legislators, scientists, opinion-formers, media and the public at large (Cefic, 2006). By building trust, the industry can anticipate and effectively address the important policy and society issues affecting the industry's long-term prospects and competitiveness. To support this process of building trust, initiative is taken by the industry itself by launching the Responsible Care Programme (E.R. 3). In 1985, this voluntary programme is started to address public concerns about manufacturing, distribution and the use of chemicals. Under Responsible Care, the world-wide chemical industry is committed to continuous improvement in all aspects of health, safety and environmental performance and to be open and transparent in communication with their stakeholders. The number of chemical industry associations embracing the Responsible Care programme has grown to 52 countries in 2006.

### 3.1.2 Current Position of the Chemical Industry

Despite the positive facts and figures, the future for the EU chemical industry might be less bright. The European chemical industry can still be portrayed as vibrant and strong. However, worldwide competition is getting fiercer, and the EU as a major chemical production region is at risk. Developments in the last 10 years show the EU was the leader in world chemicals sales, but has continuously lost ground against Asia. As a result, the EU chemicals industry is still in a top position, but has lost its first place in the ranking to Asia in 2005 (E.R. 2). Regulation, energy, transport and investments have a strong impact on the industry's competitiveness. On all four counts, the picture in Europe compares unfavorably to that in other parts in the world (Cefic, 2004). On the regulatory front, the EU is continuing to tighten its health, safety and environmental laws, more than in most other parts of the world. For this aspect, in December 2006 the EU finalized the process of creating a new chemicals policy: REACH (Registration, Evaluation and Authorization of Chemicals) (E.R. 4). This new policy is defined because it is recognized both by politicians and industry that the existing European chemicals legislation is unclear and inefficient. The overall goals of REACH are to ensure protection of human health and environment at one side, and to maintain the competitiveness of the European chemical industry and to prevent fragmentation of the internal market at the other side. REACH requires the industry to register all existing and future new substances with a new European agency. Unless REACH is a step forward, the concerns of the industry about the laws and regulations in Europe still exist (E.R. 5). REACH enters into force on 1 June 2007.

Besides, the chemical industry is an energy intensive industry, but energy costs in Europe are higher than in Northern America and Asia. Another important disadvantage for the EU chemical industry is the overloaded transport infrastructure in Europe, and the higher logistics costs.

Finally, investments in the EU's chemical sector are shrinking steadily. This includes R&D expenditures as well as capital investments. Maybe even more worrying for the long term is the dwindling number of students graduating in chemicals-related disciplines in Europe. Summarized the current developments result in a conflicting cost pressure for the chemical industry in Europe. This conflicting cost pressure is reflected in figure 9. Downward there is cost pressure by the increased competition from rapid growth of Middle Eastern and Far Eastern chemical industries. At the same time there is an upward cost pressure by higher fuel and labor costs, tighter environmental and security controls, congested transport infrastructure, and longer distance to customers.



*Figure 9: Conflicting Cost Pressure (McKinnon, 2004)*

To secure the industry's long-term competitiveness, decisive action by both the industry and the authorities is required to steer the critical drivers determining the chemicals industry in the right direction over the next ten years (Cefic, 2004; ECTA, 2006; Budde et al., 2006). One of these critical drivers is supply chain collaboration (Cefic, 2004; McKinnon, 2004; Roller et al., 2004). This collaboration could take place along similar firms (horizontal collaboration) or along the vertical chain between producers, distributors, customers and logistics service providers (vertical collaboration). The chemical industry has outsourced its physical logistics almost universally while retaining most of its supply chain control and design (Braithwaite, 2005). Stronger relationships need to be established with the LSPs to find truly innovative and therefore competitive supply chain solutions. Creating win-win relationships between suppliers and LSPs offer major opportunities for value creation and competitive differentiation (Engel and Roolfs-Broihan, 2006).

### 3.1.3 Subsectors in the Chemical Industry

As many other sectors, the chemical sector exists of a diverse range of products, processes and organizations. To categorize subsectors in the chemical industry we use a model as presented by the Dutch Association of Logistics Management (VLM, 2003). In this model, displayed in figure x, the supply chain is divided into four basic steps (raw materials, bulk chemicals, intermediates and end-users) and five types of companies are distinguished:

- Raw materials: companies that mine raw materials like oil, gas and minerals
- Basic chemicals: companies that process natural raw materials into basic chemical products like acetone and toluene.



- Intermediates: companies that use basic chemicals as ingredients for products like resins and additives.
- End-users: companies that use chemicals to produce end-products like personal care products or coatings.
- Integrated companies: companies that have three or more of the above described activities in-house.

On a higher level the chemicals industry is divided into two subsectors: commodities and specialties (E.R 2; Hofmann and Budde, 2006). When we compare this to the type of companies distinguished in figure x, the raw materials and basic chemicals companies are categorized as commodities, and the intermediates and end-users are marked as specialties.

The subsectors differ not only in the products supplied, but more differences can be distinguished. Commodities are more capital intensive, produced in large volumes, and have low profit margins. On the contrary, specialties are characterized by low volumes, high profit margins and high investment risks. These differences also affect the logistics processes. Commodities have a continuous 24/7 production process, focus on cost reduction and use tank and pipeline transportation. On the other hand, production processes for specialties are organized in batches, specialties are mainly distributed as packed materials, and this subsector is more customers driven. The above presented overview of subsectors in the chemical industry is summarized in figure 10.

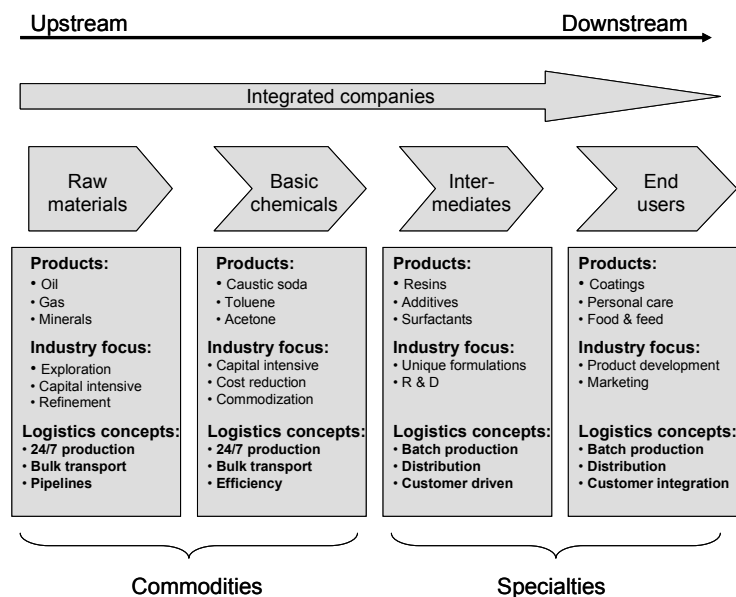


Figure 10: Chemical Supply Chain (adapted from VLM, 2003)

## 3.2 LSP Sector

### 3.2.1 Current Situation

Logistics service providers (LSPs) is a collective term used for a whole group of firms which all supply logistics services but differ in terms of services supplied and assets owned. In this study we will use a broad definition of the term logistics service providers that is applicable for different types of service providers. A LSP will be defined as follows: *a logistics services provider is a company that provides logistics service on request and payment of an external firm (Lambert et al, 1998).*

In spite of the increased outsourcing activities towards logistics service providers, LSPs are facing hard times. There are several causes for this problem: fierce competition in the global market, high

fixed cost, fragmentation of transport flows, congestion, shortage of staff, rising petrol and labor prices, the proliferation of products with shorter life cycles and the increasing expectations of customers in terms of both service and price (Crujssen et al, 2005; Groothedde et al, 2005; Verstrepen et al, 2005). As a result competition at price level increases and profit margins decrease. The profit margins on road transport over the last decade are depicted in figure 11.

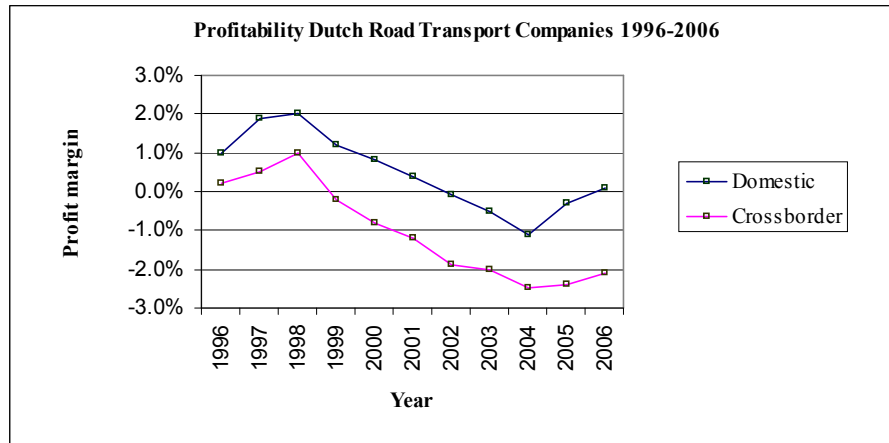


Figure 11: Profitability Dutch Road Transport Companies (TLN, 2006)

Also the vicious circle in figure 12 displays the current situation of the LSPs. Service providers industry is characterized by low profit margins, strong fragmentation and price competition. As a result, service providers do not have the time and money to develop new skills or undertake new projects to create competitive advantage. Consequently, no innovation or initiatives are undertaken to structurally improve the level of service. Therefore, the logistics services will remain a commodity and competition will be focused on the lowest price. This results in even thinner profit margins and stronger competition: starting another iteration of the vicious circle.

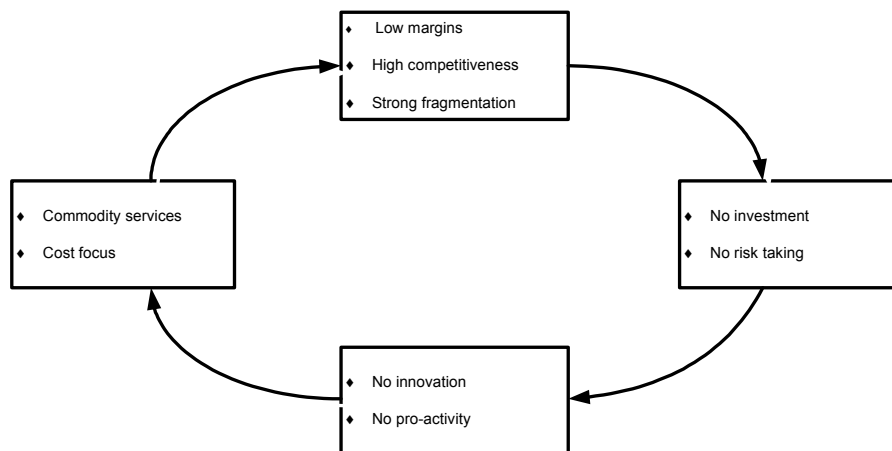


Figure 12: Vicious Circle LSPs (Crujssen, 2006)

As a result of the situation presented above, LSPs focus on efficiency by achieving economies of scale and scope. Therefore, during the last decade the LSP industry is characterized by mergers and acquisitions. Some examples of the last years are: acquisition of ACR logistics by Kuehne + Nagel in

2004, the acquisition of Exel by Deutsche Post in 2005, and the merger between Frans Maas and DFDS in 2006.

Beside mergers and acquisitions, economies of scale and scope are also reached by collaboration. Therefore, collaboration concepts are important for the long term competitiveness of the LSPs. This means the service providers have the challenge to become the customer's partner instead of merely its supplier.

### 3.2.2 Different Types of LSPs

As already mentioned in the previous section, logistics service providers differ in terms of services supplied and assets owned. This is a result of the fact that the buyers of logistics services act on different markets with their own specific requirements. Therefore, the requested logistics services differ case by case. In this study the classification as used by Vannieuwenhuysse (2003) is used to distinguish different types of LSPs.

- *1<sup>st</sup> Party-logistics (1PL)*: in a 1PL concept, logistics activities are not outsourced, but performed in-house by the shipper. The 1PL is therefore not an autonomous service provider, but an integrated department of the shipper's firm.
- *2<sup>nd</sup> Party-logistics (2PL)*: a shipper outsources the operational activities of logistics tasks (transport or warehousing) to a specialized provider, but organization and planning are still be done by the shipper.
- *3<sup>rd</sup> Party-logistics (3PL)*: a 3PL allows a shipper to outsource a package of logistics services. This LSP takes the responsibility for planning and organization, and in that role communicates with both the shipper and the receiver(s). A 3PL provider has the possibility to use his own assets, but can also use assets of other providers. In the last case, the provider is an intermediary between his customer and other LSPs. The provider is then characterized as a 3PL+ (Rustenberg et al, 2006).
- *4<sup>th</sup> Party-logistics (4PL)*: a provider that delivers a comprehensive supply chain solution to the shipper by even taking the responsibility for the management of the logistics activities. A 4PL focuses on this orchestration role and therefore generally does not own logistics assets.

This classification makes it possible to illustrate the development process of the logistics service providers' industry. During the last decades the scope and number of provided (and requested) services have increased. Consistently, the number of logistics service provider types is also increased. This process is illustrated in figure 13.

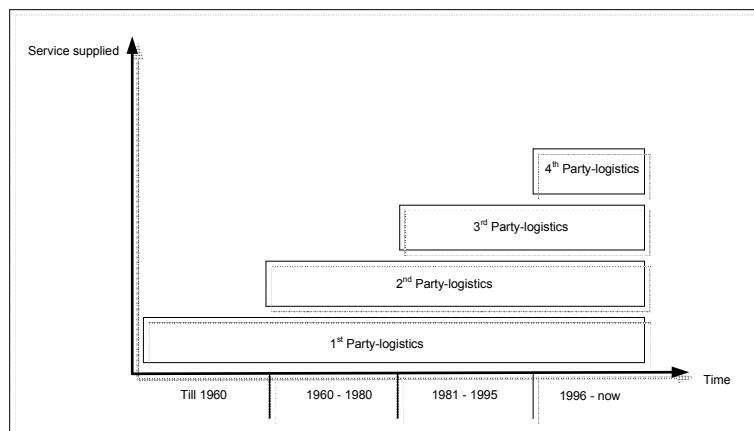


Figure 13: Development LSPs over the Last Decades (adapted from Rustenberg et al, 2006.)

## 4. Case Study Results

The theoretical findings as presented in chapter 2 and 3 are refined in practice by five exploratory case studies. As a starting point for this empirical study five propositions are defined based on the results of the literature and market review. These propositions and the accompanying reflection are presented below in separated sections. The discussion is illustrated by some quotations perceived during the interviews.

### 4.1 Proposition 1: Logistics Collaboration

#### Proposition 1:

*It is expected that collaborative relationships between shippers and logistics service providers are still focused on operational execution of activities*

In subsection 2.1.2 three characteristics (scope, objective and horizon) are used to distinguish three types of logistics collaboration. These three characteristics are also used to analyze the discussed collaboration projects during the case study research. The scope and objectives of most of these projects have an operational character. Therefore, they are characterized as operational collaboration (type A). The focus in these relationships is on operational management and execution of the outsourced activities. Although the contracts of some of the projects are relatively long (3 or 5 years), based on scope and objective the collaboration is still classified as operational collaboration. The mid and long term contracts are often used for more complex logistics services like warehousing, logistics hubs and transport management. Longer contracts are needed to cover the required investments at the side of the service providers.

Shippers are still scared to transfer more responsibility to a service provider, and to start collaborating on a higher level. Fears about loss of transparency, fears about dependency of a certain provider, and problems to find a reliable and capable partner are reason given to not intensify collaboration. Other shippers have identified supply chain design and control as one of their core businesses. Physical logistics and accompanying assets are defined as none core activities by all case companies, and for that reason outsourced to LSPs.

Also LSPs are focused on the operational side of the collaboration, and they spent less time to maintain their relationships. A more pro-active role and initiative to share future plans and possibilities to improve collaboration is required.

*“.....we are so busy to run the daily operation; we spent too little time to discuss with our customers about long term vision on the collaboration between the two companies. As you talk about partnership, we should initiate such a discussion twice a year.....”*

Our observations support the first proposition. Almost all analyzed collaborative relationships between service providers and shippers are focused on the operational execution of activities. Supply chain design and control are retained by the shipper and are not outsourced. Only longer commitments from both sides will not result in more efficient operations. Of course longer commitments will give service providers possibilities, in time and money, to invest in tailor-made services and to identify improvements. Nevertheless, the service provider needs to be pro-active in this. Beside, shippers have to be willing and able to share data and responsibility at a higher level, enabling both parties to benefit from more solid collaboration. Current situation is illustrated in the following quote.

*“.....every time, mutual short term profit prevails over long term collaboration. Despite, both parties have already been saying for years this should be changed. It is a downright shame...”*

## 4.2 Proposition 2: Purchasing Process

### Proposition 2:

*Because of the time and cost intensive character of a logistics service buying process, it is expected that shippers are reserved to initiate new tender projects*

Most LSPs receive tender documents on a very regular basis. This will be inherent to the short term horizon of many contracts between service providers and shippers. At the end of most contracts new tender projects are started; often only for benchmark purposes. All follow a standard structure as explained in section 2.3.1.

In the service providers' opinion many tender projects are not prepared well, and contain incomplete or incorrect data. Complete and correct data are of vital importance for the service providers to develop a good response document. Developing such a document is in general a time consuming exercise for the LSPs. These efforts are usually not rewarded. Therefore, service providers should help themselves to be more critical in deciding to which incoming requests they would respond. Only a few interviewed LSPs have defined specific criteria to screen incoming requests. Alternatively, some LSPs suggest that the cost spent on tender projects should be (partly) compensated by shippers. This will help to enforce shippers to be more reserved to start new tender projects.

At this moment, costs spent on a tender project are usually not an issue at the shippers' side. As long as the savings of yearly tendering exceed the costs of this process, the situation will not change.

*"...as long as my department saves 3 percent on our transportation budget by yearly tendering, this exceeds the cost, because the cost are just 1/5 of the savings. It will become interesting as when we need more effort to realize these savings..... "*

An important question that needs to be answered by shippers is, whether there are still net savings when an integral cost approach is used to calculate the costs of a tender project. Savings need not only to be compared with the cost of time spent on the project, but also switching cost and cost of a lower performance level need to be taken into account.

Most RFP's for basic logistics services are tariff driven and have a closed character. This means that in such a situation the service providers is not asked to define a logistics solution, but only asked to provide rates. Also tender procedures for more complex logistics services are more cost than concept driven. In many cases shippers have already defined the logistics concept themselves during the internal preparation phase. Although, the service providers are asked to submit some suggestion for improvement during the other phases of the buying process, the focus is mainly on the costing side. Such a situation can result in a missed change to use the expertise and capabilities of a service provider to optimize (parts) of the supply chain. For more complex logistics solutions a more open approach could be beneficial. In one of our cases we found an example:

*"...the objective of this project was to optimize our supply chain. We did not use a standard tender procedure, but we used an open approach and invited a limited number of LSPs to design logistics concepts based on the data provided. To force ourselves to focus on the concepts proposed in stead of the submitted prices, the response documents of the first round did not contain prices only concepts.....At the end we succeeded to lower the total supply chain costs because of changing our concepts..... "*

Summarized, in general shippers are not reserved to start new tender projects. The decision to start a new project should be based on an integral approach that includes all tender related costs. A lower

frequency of tendering could create more stability in supply chains. It will also give both, shippers and LSPs, the possibility to improve the quality of the remaining projects.

#### 4.3 Proposition 3: Selection criteria

Proposition 3:

*In line with other studies, it is expected that price is still a dominant decision criterion in selection an LSP.*

In the analyzed projects, price is one of the dominant decision criteria. The top five mentioned criteria are price, trust, performance, capabilities and power. These findings are in line with section 2.3.2. Power is strongly related to dependence motives. Shippers for example choice for collaboration with smaller service providers because they are often more depending in case of a large client, and therefore have stronger commitments and pay more attention to the specific shipper. In another situation shippers use a 4PL concept, but decide to source and contract all the subcontractors themselves to avoid among others a too large dependence of a specific supplier. An illustration:

*“...we explicitly decide to source and contract the underlying subcontractors ourselves, because we would like to avoid being too dependent of a single provider, improving transparency and using our purchasing power...”*

Focus on price is in line with our earlier observations of short term horizon of collaboration relationships, focus on tariff negotiation, and focus on operational execution of activities in collaboration projects. Focus on price does not always result in selecting the right provider which eventually leads to disturbances in the supply chain occur after implementation. Nevertheless, no one will argue that cost should not be an important factor in the selecting a LSP. This selection criteria should be only more balanced within the total set of selection criteria to be sure all project objectives can be achieved. Also service providers can take their responsibility in this process by, where possible, not only stretching on price in the tender process. There are more items that can be used as part of the negotiation.

*“...for our customers price is important, but has maybe a less dominating position than in other parts of the market. For our customers also performance and flexibility is important. In tender procedures we stretch on these items and afterwards we talk about the price....”*

Beside, shippers often only compare collaboration alternatives based on tariffs offered rather than using an integral cost approach. Such an integral approach should not only include the cost of a specific solution, but also the accompanying potential savings, switching and transaction costs. As also identified in the previous section, tender processes are time and cost intensive. These costs need to be included in the comparison between service providers.

At the end it can be concluded that our findings are in line with previous field studies, and the proposition is supported. Cost is still a dominating criterion in selecting service providers. This is not a problem, when the comparison of cost is based on an integral approach, and when shippers balance this criterion within the total set of criteria for sourcing logistics services.

#### 4.4 Proposition 4: Chemical Sector

Proposition 4:

*Because of the current situation in the chemical industry, it is expected that shippers have an increasing focus on creating win-win relationships with logistics service providers.*

Although most shippers indicate logistics is a value-adding function rather than a cost generator, this does not mean that they always act like this in practice. Often there is a gap. Still there are many shippers that focus on realizing cost reduction by yearly rate negotiations. At the moment they are willing to sign contracts with a longer term, but only to avoid a price-rise because of the current positive economic situation. Nevertheless, a positive exception on this overall picture got by the interviews was found. We found an example where the shipper and its providers actively work on more solid relationships, and above all where this closer collaboration has actually results in a win-win situation. This example indicates that if the objective of an outsourcing project is not purely lowering cost, but parties also invest in optimizing logistics concepts based on total supply chain cost, structural savings can be reached. This is also illustrated in the box below:

*“.....we all know that the margins in the logistics sector are dramatically low, so the results of the yearly price negotiation will be less and less. This situation will not benefit us in the long term. Therefore, we also focus on the concepts themselves; together we identify and realize savings that exceed an average negotiation result....”*

The current market for logistics services is characterized by shortage of capacity and staff, congestion, and a more demanding customers. Many interviewees expect that this situation does not have a temporary character. They confirm that a more concept driven approach and more solid collaboration with some service providers will benefit shippers in the long term. The changing business environment will force shippers to rethink their sourcing strategy.

Stronger relationships with service providers will not mean that shippers outsource all their logistics activities to one single service provider. There are at least two reasons for this. First the service providers market is too fragmented; consequently in comparison to an average chemical company, service providers are too small to serve a chemical company as a whole. Realistic possibilities for closer and better collaboration should be found in sharing data at a more detailed level, and the use of 3PL or 4PL (inter modal) concepts. These concepts should be designed at plant or business unit level, depending on the size of the shipper and service provider. In such a concept the selected 3PL or 4PL provider for example take care of the transport management activities of a specific plant, and use specialized providers to deliver the products to different destinations. A second reason for not choosing one or some service providers for all the logistics activities is the dependence of these providers. This argument is for some shippers also valid for not choosing a 3 PL or 4PL concept. Of course, in a situation of closer collaboration shippers are more depending of a service provider, but this dependence has a mutual character. In case both parties manage and control this situation with care, there should be no problem.

*“.....the relation between a shipper and his service provider is a classic buyer-supplier relationship; this is a situation of imbalanced power. Nevertheless, there is also a mutual dependence as with other suppliers. Why should this a problem? Manage it.....”*

Based on the interviews it can be concluded that there is not yet an increased focus on creating win-win relationships, but an increased awareness of the need of more solid collaboration because of the changing business environment. Some shippers are still skeptical about the potential benefits of closer relationships with their service providers, and are reserved to transfer more responsibilities to the service provider than the operational execution of some activities. Maybe it will help when the industry share good practices of collaboration projects more on a regular basis. Also the service providers should take a pro-active role in this.

Shippers should be less scared to intensify collaboration with some of their service providers. Only then logistics can be used to create a competitive advantage in a (commodity) market in which it is difficult to differentiate from your competitors only using the price as a marketing instrument. Of course selecting the reliable partner and managing and controlling the relationship are essential to enhance the potential benefits.

## 4.5 Proposition 5: LSP Sector

### Proposition 5:

*Because of the current situation in the LSP market, it is expected that service providers are focused on building stronger relationships with their customers.*

Almost all interviewees, both LSPs and shippers, describe the general situation at the LSP market over the last years as the vicious circle displayed in section 3.2.1. The market for logistics service providers was characterized by low margins, strong fragmentation and fierce competition at price. As a result, service providers had too less possibilities for investment and innovation. Therefore, logistics services remain a commodity and competition is still focused on the lowest price. Above all, the described situation is applicable for basis logistics services. The market for more advanced and specialized services is less aggressive, but still also for these kind of services the margins decreased. There are also service providers, who successfully withdraw from this situation by operating in a clear defined niche market or by creating economies of scale by actively balancing the volumes in their networks.

The current positive economic situation supports the LSP industry to break out the viscous circle. Because of the increasing demand for logistics services, the available capacity in the market is not sufficient any longer, and as a consequence the prices increase. To benefit from the changing situation an active role by the LSP is required. Service providers need to be careful that the current situation does not result in even lower margins. This is illustrated in the quote on the next page:

*“...because of the current situation, we have that much load and commitments to our customers that we not focus on return-shipments. As a result trucks are driving back home empty; we work harder and harder, but the profitability decreases.....”*

There are providers that use the changing market to evaluate their customer database critically to decide which customers fit well into their portfolio and network. They select a number of customers to intensify collaboration. More intensive collaboration is not only reflected in longer contract terms and commitments from both sides. Of course, longer commitments give the service providers the possibility to invest in tailor-made services. But when the closer collaboration also results in sharing forecasted volumes at a more detailed level, networks can be optimized and balanced better. Both shippers and providers will benefit, in terms of cost and service, of a more sustainable network at the providers side.

The changing situation gives service providers the possibility to make more explicit choices. These choices are a good starting point to change the current situation, and to start more intensive relationships. Nevertheless, often the initiative to build stronger relationships is taken at the shippers' side. The LSPs are open for long and more solid relationships, but they do not take the initiative or invest in the relationship in terms of, time, knowledge and capabilities. The service providers should take a more pro-active role to change the “cherry picking” behavior of logistics service buyers, but this is only possible when they also actually act as a professional business partner. Situations as illustrated below by one of the shipper should be part of the past.

*“.....some service providers frequently not showing up, in spite of the signed contracts we have with these providers. What is the value of their signs and commitments, and will this problem be solved with longer commitments and contract periods from our side.....”*

At the end it can be concluded that the market for service providers is changing. To benefit from this changing situation, an active role from the LSPs is required. The service providers should not wait for





shippers, but should do whatever possible by establish stronger relationships with their customers, and not only be focused on running the daily operation.

## **5. Conclusions and further research**

### **5.1 Conclusions**

This report opens up with the results of a literature review on different elements of logistics collaboration and outsourcing. The literature is followed by sector analysis of the two sectors involved in this study: chemical and logistics service provider industry. The results of the literature review as well as the sector analysis are used to formulate five propositions. These propositions are refined in five exploratory case studies. The observations can be summarized as follows:

- Most analyzed collaborative relationships between shippers and logistics service providers in the chemical industry are still focused on operational execution of logistics activities and have a short term horizon. Supply management design and control are often retained by the shippers.
- Despite the time and cost intensive character of a logistics service buying process, shippers tendering on a very regular basis. The decision to start a new tender project should more often be based on an integral approach that includes all tender related costs. A lower frequency of tendering could create more stability in supply chains. Beside, it will give both, shippers and LSPs, the possibility to improve the quality of the remaining projects.
- Price is still a dominating decision criterion in selecting a LSP. This is not an issue as long as the comparison of costs is based on an integral approach, and when shippers balance the cost criterion within their total set of criteria for sourcing logistics services.
- At the shippers' side there is an increased awareness of the need of more solid collaboration with logistics service providers. Nevertheless, in many cases this increased awareness does not actually result in the required actions to establish more intensive collaboration.
- Over the last years the logistics service providers industry was characterized by low profit margins, strong fragmentation and price competition. Nowadays, the market for LSPs is changing, because of an increasing demand for logistics services. To benefit from this situation a more proactive role of the service providers is required in building stronger relationships with their customers. They should pay more attention on mid and long term possibilities in a collaborative relation, instead of only be focused on running the daily operation.

This study presents overall observations based on the perceptions and opinions of a limited number of participants. Therefore, the results will not be applicable for all players in the chemical and LSP industry. Exceptions will exist, and generalization of the results to a broader population will not be possible. This was also not the purpose of our study. Our objective was to develop an understanding of logistics collaboration in the chemical sector from both the shippers' and LSPs' perspective. This objective has reached successfully.

### **5.2 Further Research**

This research project and the accompanying report mainly have a descriptive character. The next step is to analyze logistics collaboration decisions in more detail to identify actual thresholds in these decisions. For this identification a so called stated preference experiment will be used. This methodology enables us to analyze decision behavior of individual respondents by proposing (hypothetical) choices during an interview. Each choice is described as a bundle of variables, which are expected to impact the interviewees' choice.

The interviewees make their choices during the stated preference interview in the context of a theoretical case. To be sure that the this case presents a realistic situation which gears to the respondents' perception, the case and accompanying choices are designed based on the results of this study.

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