A dynamic framework for managing horizontal cooperation in logistics

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Abstract: This paper first explores the motives and drivers that Logistic Service Providers (LSPs) may feel to start up horizontal cooperation. Secondly, a classification supporting LSPs in their search for a suitable collaboration structure is developed based on distinguishing cooperation characteristics encountered in practice. The third contribution consists of a description of the typical life cycle of a partnership and how it can be managed over time. Partnerships are presented as a means for LSPs to cope with increasingly difficult market conditions. In addition, they offer positive side effects for society and the environment.

Keywords: horizontal partnerships; supply chain collaboration; LSPs; logistic service providers; cooperation life cycle; framework.
1 Introduction

Today, the most frequently cited problems of Logistic Service Providers (LSPs) are low capacity utilisation, empty haulage, a negative public image and declining profit margins. The main causes for these problems are the stiff competition in global markets, high fixed costs, rising petrol and labour prices, the proliferation of products with shorter life cycles and the increasing expectations of customers. As a result, the number of bankruptcies of particularly small and medium sized LSPs in Western Europe has steadily been rising over the last decade.1

Horizontal partnerships (i.e., partnerships between companies that operate at the same level of the market) have proven to be particularly useful to cope with these difficult circumstances and to amend the efficiency and competitiveness of participating LSPs. Lambert et al. define a business partnership as a

“tailored business relationship based on mutual trust, openness, shared risk and shared rewards that yields a competitive advantage, resulting in business performance greater than would be achieved by the firms individually.”

(Lambert et al., 1996)
Except for a small number of successful cases in North America, horizontal collaboration in logistics is mainly gaining momentum in Western Europe. In Belgium and the Netherlands, the European logistic centres of gravity, the authors are aware of over 50 formal logistics partnerships. Through close collaboration, the partnering LSPs aim at increasing productivity, e.g., by optimising vehicle capacity utilisation, reducing empty mileage and cutting costs of non-core/supporting activities to increase the competitiveness of their logistics networks (Cruijssen et al., 2007a).

The literature on horizontal logistics partnerships is well developed for maritime shipping and the airline industry. In maritime shipping, conferences are a common concept. A conference is an alliance of multiple shipping companies that offer their services on a specific transportation line against collective tariffs and identical service levels (van Eekhout, 2001). The advantages that are claimed for these conferences are economies of scale through larger volumes shipped and better customer service (Shepperd and Seidman, 2001). Moreover, conferences prevent price wars by offering rate stability. Generally, clients oppose to conferences because they feel that the ability of carriers to effectively compete is greatly reduced when they become a member of a conference (Clarke, 1997). The frequent investigations of this claim have for example resulted in a series of US government acts running from as early as 1916–1998 (cf. Lewis and Vellenga, 2000). Alliances also play an increasingly dominant role in aviation. Some examples of big alliances are: Skyteam (9 airlines), Star Alliance (16 airlines), Qualifier (11 airlines), and OneWorld (8 airlines). Economically, there are strong incentives for airlines to operate dense international networks. Growth through mergers and acquisitions may provide a strong expansion of a carrier’s network. However, the current granting of international traffic rights is largely confined to specific carriers substantially owned by a country. This has left alliances of independent carriers as an effective compromise for international carriers to increase their joint market power (Fan et al., 2001). Besides the higher customer service that is offered, aviation alliances enable higher load factors of aircrafts and a more efficient backoffice organisation. See e.g., Park (1997) and Oum et al. (2000) for further information on airline alliances.

In contrast to maritime shipping and aviation, the literature on horizontal partnerships in logistics on the landside is rather limited. Caputo and Mininno (1996) discuss horizontal integration of logistics functions in the Italian grocery industry. Various policies that competing companies can adopt to reduce total logistics costs are examined, such as standardised pallets and cartons, multi-supplier warehouses, multi-distributor centres, co-ordinated routing and joint outsourcing. Erdmann (1999) also discusses this subject and constructed a model to estimate the synergy potential in the German consumer goods industry. In another contribution, Vos et al. (2002) elaborate on this subject by defining three types of synergy: operational synergy, coordination synergy and network synergy. This classification is based on the scope of the cooperation. Operational synergy concerns only a single process or activity. Secondly, when the cooperation takes place across several activities and there exists harmonisation of these processes, coordination synergy is exploited. Finally, network synergy resembles a restructuring of a complete logistics network by multiple partners cooperatively. Bahrami (2002) refers to the economies of scale in joint transportation as cost sub-additivity, offering a real-life case study of two German consumer goods manufacturers (Henkel and Schwarzkopf) that have merged their respective distribution activities. Three scenarios are compared:
the traditional situation without cooperation
• joint distribution within the current logistics structures
• optimisation of the logistics. For an extensive literature review on horizontal cooperation in logistics, the reader is referred to Cruijssen et al. (2007b).

A number of well-known frameworks and best practices currently exist that deal with the creation of partnerships in logistics. However, it should be noted that these frameworks implicitly focus on vertical relationships rather than horizontal ones. Collaborative Planning, Forecasting and Replenishment (CPFR) emerged in 1995 as a concept that aims to enhance supply chain integration by supporting and assisting joint practices. It seeks cooperative management of inventory through joint visibility and replenishment of products throughout the supply chain. Information shared between suppliers and retailers aids in planning and satisfying customer demands through a supportive system of shared information. The Supply-Chain Operations Reference (SCOR) model is another example of a vertically-oriented logistics framework. SCOR is a management tool that enables users to address, improve, and communicate supply chain management practices within and between all interested parties, spanning from the supplier’s supplier to the customer’s customer. The SCOR model has been developed in the late 1990s to describe all business processes associated with satisfying a customer’s demand. Customer Relationship Management (CRM) deals with the planning and modelling of sales and service activities involving direct clients of customers. By definition, CPFR, SCOR and CRM can all be categorised as vertical models. Very little attention has been given so far to the modelling of collaborative logistics activities that span across two or more independent organisations or supply chains.

The objective of this paper is therefore to develop a framework for classification of horizontal cooperation in logistics, based on insights from the literature, empirical data from two recent surveys and 30 in-depth interviews in Flanders and the Netherlands. To date, literature lacks such an encompassing framework for horizontal cooperation in logistics. This is an important gap, since the interviews indicate that the successful creation and management of horizontal partnerships is a controllable process with a number of clear success and failure factors, rather than a matter of chance.

This paper is further organised as follows. In Section 2, the internal and external motivating factors for horizontal cooperation are discussed. Section 3 provides a classification for forms of horizontal cooperation arising in practice. A stage-wise description of the dynamic development of horizontal partnerships over time is presented in Section 4. Finally, in Section 5 we draw the most important conclusions.

2 Motivating factors for horizontal cooperation

Horizontal cooperation can improve the performance of both core and non-core processes of LSPs (Dyer and Singh, 1998; Esper and Williams, 2003; Ritter and Gemünden, 2003; Smith et al., 1995). The motivation to cooperate can either be driven by internal motives (such as management decisions and goals) or by external motives (such as evolving market conditions or customer requirements).

In Belgium and the Netherlands, the European logistics centres of gravity, the authors are aware of over 50 formally articulated horizontal logistics partnerships. To map
the views of managers of LSPs, they were asked to indicate on a 5-point Likert scale to what extent they agreed with propositions on the opportunities, impediments and drivers for horizontal cooperation. The options were:

- strongly disagree
- disagree
- neutral
- agree
- strongly agree.

Data were collected in two separate stages for two countries: Belgium and the Netherlands. In March 2004, a first survey was sent to 1537 Flemish LSPs. The sample consisted of companies in the Nace-Bel categories Freight transportation by road, Inland water transportation, Cargo handling and storage, Freight forwarding and Courier activities other than national post activities. More detailed information on both the sample and the results of this survey can be found in Cruijssen et al. (2005).

The second survey was sent out in June 2004 to Dutch logistics service providers, again by means of personalised questionnaires. These companies were selected from a database supported by Holland Transport (http://www.hollandtransport.nl/). This database contains information on over 12,000 Dutch transportation companies. The companies are subdivided into six categories based on the number of truck permits. More detailed information on both the sample and the results of this survey can be found in Cruijssen and Dullaert (2006).

The main findings of Cruijssen et al. (2007a) are that in general Flemish LSPs strongly believe in the potential benefits of horizontal cooperation to increase their profitability or to improve the quality of their services. The impediments for cooperation that are perceived or expected by the non-cooperating LSPs prove to be experienced by the cooperating LSPs. Finding a reliable party to lead the cooperation and constructing a fair allocation mechanism for the benefits are the impediments that respondents agree with most.

Statistical testing revealed that some noticeable differences between the two regions exist in their evaluation of the impediments to cooperation (Cruijssen and Dullaert, 2006). Flemish LSPs find it more difficult to find partners to cooperate with than their Dutch colleagues do. Also, Flemish LSPs expect more problems from Information and Communication Technology (ICT) issues and the sharing risks and rewards. As a result, Flemish LSPs are more hesitant to engage in horizontal cooperation than their Dutch counterparts. For more details on the research setup, the theoretical basis of the propositions, the sample and the response rates, we refer to Cruijssen et al. (2007a) and Cruijssen and Dullaert (2006).

As statistical testing indicated that there is no statistical difference between the evaluations of both groups of the opportunities of horizontal cooperation, Figure 1 reports on the external and internal opportunities for the total of Flemish and Dutch respondents active in road transport. The external motives for LSPs to cooperate relate to changes in the customer base, economic environment, and the LSP industry in general. Internal motives for cooperation are related to reinforcing a perceived weakness or enlarging the set of available resources of the company, e.g. better utilisation of existing infrastructure.
and assets, increasing capacity, extending geographical coverage, improving or diversifying service.

Figure 1 Internal and external motives for horizontal cooperation

Figure 1 indicates that almost 80% of the Flemish and Dutch LSPs involved in road transport (strongly) believe that horizontal cooperation increases the company’s productivity on core activities (proposition I1, average score 3.27, standard deviation 1.08). These findings are confirmed by other research on savings in routing costs resulting from horizontal cooperation. Cruijssen et al. (2007c) report on savings up to 30% and more for theoretical and empirical problem instances. For a discussion on the impact of routing characteristics such as the number of orders, average order size, market concentration etc on these savings, the reader is referred to Cruijssen et al. (2007c). Respondents also strongly support the potential of cooperation on non-core activities such as joint safety training, joint fuel facilities (I2, avg = 3.62, stdev = 0.99), reduced purchase costs for e.g., vehicles, onboard computers etc (I3, avg = 3.52, stdev = 1.07) and offering higher quality of service at lower costs (I4, avg 3.45, stdev = 1.09).

Almost 60% of the respondents thinks that horizontal cooperation can allow partners to specialise and at the same time broaden their services (E1, avg = 3.60, stdev = 1.06). Positive support for the benefits in tendering for large scale contracts, quite common in the chemical transport industry because of the large volumes involved, is smaller (E2, avg = 3.58, stdev = 1.09), but less than 15% disagrees on proposition E2. The same goes for the protection of market share where both positive and negative evaluations are rather small as 40% of the respondents tends to be neutral with respect to this proposition (E3, avg = 3.27, stdev = 1.08).
3 Brief review of literature of modelling approaches

The drivers introduced in the previous section illustrate the growing importance of horizontal cooperation to face external threats to the organisation and to realise internal organisational goals. This explains the growing popularity of logistics partnerships during the last few years (cf. Ostroff, 1999; Lynch, 2001; Barabasi, 2003). The nature and structure of these partnerships however tend to differ widely, ranging from ad hoc freight exchanges between a limited number of partners to e.g., the joint operation of multimodal freight platforms. As a means

- to classify and compare forms of horizontal cooperation arising in practice
- to support the development of a ‘manual’ for cooperation
- to offer LSPs support in identifying the type of horizontal cooperation that best suits their situation, we introduce in this section a classification of horizontal logistics cooperation.

This classification incorporates four dimensions:

- operational/tactical/strategic
- competitive/non competitive
- combined assets
- objectives.

In the next four subsections, these dimensions and their role in the classification will be discussed.

3.1 Operational/tactical/strategic

Zinn and Parasuraman (1997) introduce a typology of so-called logistics-based strategic alliances. Although in principal this typology is set up for vertical cooperation, it has a direct interpretation for horizontal cooperation as well. It is based on two dimensions, these being the scope and the intensity of the relationship between the partners. Scope is defined as the range of services for which cooperation takes place, and intensity is defined as the extent of direct involvement that exists between partners. Possible indicators of intensity are the size of assets invested and the number of working hours dedicated to maintaining the cooperation. The level of intensity is proportional to the difficulty that a participant encounters if he should wish to replace one or more of his partners by other companies.

In this paper we aim at combining the scope and intensity of a partnership in making a distinction between operational, tactical, and strategic cooperation. *Operational cooperation* relates to the daily operations within the logistics company. It is mainly practical in nature and can be described as “joint execution” or “sharing operational information”. *Tactical cooperation* relates to achieving mid-term objectives and involves more intensive planning and more substantial investments. Tactical cooperation can be described as “joint organising”, “servicing a market together” and “sharing logistic resources”. *Strategic cooperation* is aimed at achieving long-term company objectives. It is characterised by intensive planning and is closely related to the mission statement,
core activities and core competences of the company. It forms the basis of tactical and operational activities. Strategic cooperation can be described as “joint learning”, “joint development of innovative concepts” and “joint investments”.

In most cases of horizontal cooperation we observed in practice, strategic cooperation cannot be achieved without preceding cooperation at the tactical level. Similarly, tactical cooperation seems to require a well-established cooperation at the operational level. The apparent growth path of logistics partnerships is discussed in more detail in Section 4.

3.2 Competitors/non-competitors

The second dimension in our classification concerns competition. Horizontal logistics cooperation can either be competitive or non-competitive. Non-competitive horizontal cooperation occurs when transportation companies servicing different industries (e.g., tank transport, express services, removal services) start a joint knowledge platform. If the partners are servicing the same industries, they are direct competitors and the cooperation can be referred to as competitive horizontal cooperation.

3.3 Combined assets

In practice, a surprisingly large range of horizontal logistics partnerships can be identified. All these types of cooperation are based on the sharing of tangible or intangible assets. For our classification we identify the following six groups of assets that can be combined to the benefit of all participants:

- orders
- logistics facilities
- rolling stock
- market power
- supporting processes
- expertise.

The extent to which partnerships are aimed at combining these assets is the basis of the third dimension of the classification.

3.4 Objectives

Based on Porter (1998) and Deschoolmeester et al. (2004) we present a last dimension for horizontal cooperation based on the explicit objectives of horizontal cooperation:

- cost reduction
- growth
- innovation
- information and quick response
- social relevance.
Below each motive is discussed and illustrated by means of concrete examples from the logistics sector.

3.4.1 Cost reduction
The most frequent objective of horizontal cooperation is cost reduction, either in core or non-core activities. Most short-term cooperation initiatives from practice have cost reduction as their primary goal.

3.4.2 Growth
Through collaboration, LSPs can establish financial growth (increased turnover or profit) or geographically extend their coverage by combining the networks of all partners. Moreover, the bundled forces of cooperating medium sized LSPs make it possible to tender on large contracts that are normally only reserved for the bigger players. In some industries, such as e.g., the petrochemical industry, joint tendering is common practice as the volumes to be shipped and the service requirements to be met are too high for any LSP to handle on an individual basis.

3.4.3 Innovation
Innovative service concepts, the introduction of new systems and technology (e.g., RF tags) and interorganisational learning can increase the quality of the services offered by cooperating LSPs. The new concepts or technology will in many cases be too labour- or capital intensive to be introduced by a single company. In competitive and cost-sensitive industries such as e.g., retail, customer satisfaction and inventory visibility are crucial to profit and growth. Leading retailers have therefore taken the lead in investing heavily in RFID technology (Aberdeen Group, 2007) and LSPs have to follow to integrate this into their systems. Some larger LSPs such as Ewals Cargo Care (www.ewals.com) have invested in supply chain monitoring on their own account (Dullaert and Van Landeghem, 2007), but the same can be achieved by collaborating medium-sized LSPs.

3.4.4 Quick response
Dyer and Singh (1998) list coordination and communication as one of the main enablers of cooperation. In an economy that is enabled by information flows, obtaining the most accurate and real time information offers the key to a world wide competitive advantage (Gunn, 1994). Real-time, event-driven or clockspeed management refers to the speed at which information flows are gathered and processed within a network of partners. Companies are considered more and more in the context of extended enterprises, a collection of partners consisting of the company under consideration, its suppliers and customers. Although real-time can be defined in absolute time spans (see e.g., Gunn, 1994) the ability to anticipate and respond to changes in the market (events) is the key. Ranadivé (1998) states that “real-time refers to the time frame in which your customer wants satisfaction”.
Technological progress in information and communication technology supports cheap and efficient communication between the partners in a network. By exchanging business and information processes between customers, companies, suppliers and other business partners, the company is able to jointly plan, implement and control the flow of materials, services and information. By collecting, analysing and distributing real-time information to management, the company aims at obtaining a competitive advantage based on cost economies (Gartner Group in Einarsson, 1999) and by responding quicker than its competitors to events and changes in the market place.

Both cooperation and information technology allow a real-time or event driven company to create and apply active information quicker to anticipate shifts in competitive forces and respond to them before rivals do, thereby in fact exploiting change (Porter, 1998). The shortened response time and improved ability to react to changes therefore offers the partners a competitive advantage. To realise this competitive advantage, the organisational structures of the partners need to be harmonised which requires far-reaching ICT integration (Gunnarsson and Jonsson, 2003).

Horizontal cooperation is often the fastest way to reduce response time, obtain first mover advantages or successfully enter a new market even if the company would be qualified enough to act individually. This is illustrated by the logistic partnerships of many Western European LSPs with partners in Eastern Europe and the Far East.

Besides through best-in-class ICT capabilities, response times can also be shortened by introducing innovative cooperative logistics concepts or by benefiting from partners’ distribution or storage networks. For example, courier companies may exchange orders to cut lead times to levels that would be impossible to achieve individually. Most cooperations that aim at shortening response times, also require active involvement of the customers (vertical cooperation). Reliable order forecasts can e.g., be helpful for LSPs to anticipate and reposition trucks.

3.4.5 Social relevance

Road transport has grown significantly during the last years. Road transport in the former EU-15 increased from 1.124 billion ton-km in 1995 to 1.376 billion ton-km in 2002, corresponding to an annual growth of 2.9% (Eurostat, 2004). This growth rate is only matched by short sea shipping (2.3%). Traffic growth for inland navigation (1.2%), rail (0.9%) and pipeline (0.5%) was significantly smaller. This has led to an increase of the market share of road transport between 1995 and 2002 from 43.0% to 44.7%.

The strong growth of road freight, and simultaneously road passenger transport, has increased congestion of the European road network. It is clear that this leads to high social costs (caused by time losses, noise and air pollution and so on). Ceteris paribus, experts claim that road traffic will further increase in the next decade. This will have a significant impact on the accessibility of European economic centres and on the European economy as a whole. Classic solutions involve a modal shift towards more environment friendly transport modes (rail and inland navigation). Although the potential of these solutions is significant for bulk trades, a large share of the (LTL-) freight market can only be serviced by road.

Horizontal cooperation between LSPs can be an effective way to achieve a higher capacity utilisation by exchanging loads and equipment between the geographically dispersed partners (cf. Categoric Software Corporation, 1999; Read, 2000). Load exchanges, central planning, shared distribution centres etc. all
increase the efficiency of road transport and are a potential remedy for the increased transport demand. Through horizontal cooperation, the increase in ton-kms can be kept under control, even when modal shift is impossible.

3.5 A classification of cooperation

The four dimensions developed in this section allow the construction of a classification aimed at situating different forms of horizontal cooperation and supporting LSPs in choosing a form of cooperation based on their specific needs. This classification is summarised in Figure 2. For a detailed description of each of these concepts, we refer to Verstrepen (2005). The authors have rated the dimensions for every horizontal cooperation initiative based on interviews with industry experts and their own insights. These assessments are intended to serve as a starting point to set up a partnership, which needs to be complemented by personal and situation-specific needs of the parties involved.

Figure 2 Classification of cooperation

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- **O** Operational
- **T** Tactical
- **S** Strategic
- **C** Competitive
- **NC** Non-competitive
- **OR** Orders
- **LF** Logistics facilities
- **RS** Rolling stock
- **MP** Market power
- **SP** Supporting processes
- **E** Expertise
- **CR** Cost reduction
- **G** Growth
- **I** Innovation
- **QR** Quick response
- **SR** Social relevance
- a side effect of a horizontal cooperation type.
- a natural aspect of a horizontal cooperation type.
- important for a horizontal cooperation type.
- essential for a horizontal cooperation type.
4 Implementing and managing horizontal cooperation in logistics

Horizontal cooperation is often an uncertain undertaking in which it is difficult to plan the required activities or measure the realised output. Even in a trustworthy relationship, the risk of opportunism remains real (van der Meer-Kooistra and Vosselman, 2000; Tomkins, 2001). Possibly due to the complexity and uncertainty in building horizontal partnerships, the set-up of cooperative relationships observed by the authors seldom occurred in a structured way. Despite the potential for productivity improvements and cost savings (see Section 1), most initiatives observed by the authors were characterised by limited gains and a short lifetime. The aim of this section is to provide support to LSPs with a conceptual framework for setting up and maintaining horizontal cooperation.

The framework is based on the classification developed in this paper, on the open questions asked when surveying Flemish and Dutch LSPs (Cruijssen et al., 2005, Cruijssen and Dullaert, 2006), on 30 expert interviews conducted by the authors and on insights derived from literature.

In addition, this conceptual framework offers a stage-wise approach leading towards horizontal cooperation. For every stage, concrete indications and points of attention are provided. The authors propose a framework consisting of four main phases (see Figure 3). A go/no go decision between each of the phases will determine whether the step to the next stage can be safely taken. The four subsequent stages are: Strategic positioning, Design, Implementation and Moderation (Verstrepen, 2005). The subsections below present each stage in detail.

Figure 3  A stage-wise approach towards horizontal cooperation

4.1 Strategic positioning

At the stage of ‘Strategic Positioning’, the LSP becomes aware of the need to cooperate and starts to explore his basic objectives. This phase is not characterised by an unambiguous starting point but is rather a process of gradually increasing awareness and trust (Lane and Backmann, 1998). A number of factors stimulate the LSP to thoroughly consider the possibilities for horizontal cooperation. Together, the four dimensions of the classification define the (starting point of the) cooperation, so the phase of strategic positioning fills in these four dimensions. After having gone through the phase of strategic positioning, the LSP knows what he can expect from cooperation (motives), how he can benefit from the partnership (objectives), whether he wants to cooperate with
direct competitors or not (competition) and whether the cooperation will take place at the strategic, tactical or operational level (intensity). When strategic positioning is completed, and when it has resulted in an intent to cooperate with two or more other LSPs, the cooperation can evolve towards the second phase: the design phase.

4.2 Design

In this phase the LSP has four important hurdles to take: he has to

- identify the right partner(s)
- negotiate about the business and financial conditions of the cooperation
- define strategy and vision of the cooperation
- choose the shape of the cooperation (see Figure 3). These four actions are explained below.

4.2.1 Partner analysis and selection

Cooperation between competing LSPs is interesting when their strengths and weaknesses are complementary (the two services increase each other’s quality, e.g., an intermodal group offers both cheap but slow service via rail/water and fast but expensive service via road) or supplementary (making a certain service ‘bigger’, e.g. a partnership between road transporters to build a pan-European network). In the first place, the company needs to map its own core activities and strategic competencies. Evaluating the suitability of a potential partner is only possible when a SWOT analysis of the own organisation has been completed.

The next step consists of identifying areas of mutual compatibility. Both the hard, measurable aspects (related to business economics and strategic fit) and soft, company cultural aspects (related to trust and cultural fit) need to be considered. Cultural fit is considered to be an aspect that especially comes to the foreground in the context of intensive, long-term cooperative relationships. The cooperation only has a real chance of success when a certain ‘chemistry’ or ‘click’ exists between all sections of the partner companies. This means that successful cooperative relationships are not only characterised by a hard, business economics reality, but also by an emotional or psychological (soft) component (cf. Ring and van de Ven, 1994).

In order to limit the danger of a unilateral dominance, a too strong dependence or an unbalanced apportionment of the benefits (gain sharing), it is advisable to choose partners of approximately the same size and market power. This is, however, no condition sine qua non as long as the necessary control and balancing mechanisms have been implemented. Indeed, allocation rules can be set up in such a way that every party benefits from a maximal utilisation of the synergy potential.

4.2.2 Negotiation

Horizontal logistics cooperation can only function properly when a mechanism is in place that permits the parties involved to share both the costs and the benefits as well as the activities in a balanced way. The shaping of this mechanism will present an important hurdle during the negotiations between the partners. A ‘unique recipe’ for
success does not exist, but a number of best practices can be identified to increase the chances of an efficient negotiation process.

The valuation of the contribution of the partners in horizontal logistics partnerships is often the result of a subtle “game of give and take”, rather than of a hard negotiation process merely based on facts and figures. In some cases the partners will opt for a proportional split of all costs and benefits of the cooperation between all parties involved. In other cases, it could be suitable to agree on the responsibilities of each party and to allocate the measurable costs and benefits that fall within these responsibilities to the parties involved. In practice, many partnerships complain about the absence of theoretically sound, and fair allocation methods. This is confirmed by the large-scale surveys of Flemish and Dutch LSPs (Cruijssen et al., 2007a; Cruijssen and Dullaert, 2006) indicating that difficulties in determining and dividing the gains of the cooperation are one of the most important impediments to horizontal cooperation in logistics (see Section 2).

The negotiation process should result in a win-win situation. Fierce negotiations with little value to be shared cannot support the cooperation for a longer period. A positive attitude during the negotiations will have an important impact on the negotiation strategy and the monetary valuation of the contribution and benefits of the cooperation.

4.2.3 Strategy and vision

Developing and implementing a clear strategy and vision is of vital importance for a sound cooperative relationship. This strategy at least contains a general description of the horizon of the cooperation, the objectives and the reach of the partners (see Table 1).

<table>
<thead>
<tr>
<th>Factor</th>
<th>Explanation</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizon</td>
<td>The projected time span of the cooperation</td>
<td>Short (&lt; 1 year) – Middle term (1–3 years) – Long (&gt;3 years)</td>
</tr>
<tr>
<td>Motives</td>
<td>See classification. The motive of the cooperation needs to be explicitly stated</td>
<td>Cost – growth – innovation – agility – social relevance</td>
</tr>
<tr>
<td>Partner reach</td>
<td>A logistics cooperative relationship gathers partners of a certain geographical region</td>
<td>Regional – national or continental – worldwide</td>
</tr>
</tbody>
</table>

4.2.4 Type of cooperation

Once the cooperating parties are convinced that all side conditions for cooperation have been fulfilled, they can start to select the appropriate format for the cooperation. Figure 1 already summarises a number of potential formats. Still, a number of other formats could be used. Based on the drivers and objectives identified in the context of the classification, the most appropriate format of the cooperation can be selected. When multiple formats are suitable for a given combination of drivers and goals, it is mostly the environmental parameters that determine the most suitable format. In addition, the number of interested partners and the desired autonomy are important considerations.
4.3 Implementation

The third phase of the multi-stage plan consists of implementation. At this point, two tasks have to be fulfilled: a contract needs to be set up, and the ICT landscapes need to be mapped so that they can be adjusted and integrated.

4.3.1 Contract

In the daily reality of logistic cooperative relationships, writing down the practical agreements for cooperation turns out to be a weak point. Horizontal cooperation often grows from the inside or as a small-scale experiment. Hereby, the parties involved often consider the set-up of a binding juridical framework to be a burden instead of an aid or necessity. Afterwards, however, the lack of a written agreement for cooperation can lead to large practical problems in the case of growth or conflict situations, or when the cooperation comes to an end. The set-up of a ‘charter of cooperation’ can therefore be an ideal compromise to formally shape the core aspects of the cooperation. This charter avoids that the partners have to proceed immediately to formulating a detailed and juridically binding contract. The aim of a charter of cooperation is to determine the common rules of the game and the vision for the future under which the partnership operates. The charter confirms the mutual trust and commitment, and forms as such the glue of the partnership. Its components need to be revised regularly along with the evolution of the cooperative project and the common vision (Ring and Van de Ven, 1992).

4.3.2 Information and Communication Technology (ICT)

Most LSPs are small and medium sized companies (SMEs). In Belgium for example, 62% companies active in road transport employ less than five employees. Only 21 companies employ 100 or more full time equivalents (0.6% of the total of 3636 in 2004) (Belfirst, 2004). According to Gunasekaran and Ngai (2003) they therefore tend to lag behind in the implementation of ICT systems. This might be a serious barrier for types of cooperation that involve extensive (order) data interchange. However, our interviews and questionnaires indicated that ICT is mainly a problem for horizontal cooperations of medium intensity. Light forms of horizontal cooperation do not require specific ICT investments, while high intensity initiatives have enough financial room to absorb the required ICT investments (Cruijsen et al., 2005).

4.4 Moderation

The final stage of the successful creation of a horizontal partnership lies in moderating the cooperation. Again, two features can be distinguished: the management and control of the processes and the strategy towards growth of the partnership.

4.4.1 Management and control

To be able to measure the success of a horizontal partnership and to correct where needed, the parties involved need to agree on a set of appropriate Key Performance Indicators (KPIs) (Kaplan and Norton, 1996). During the negotiation process, an
expected upper or lower limit or a certain target figure will be determined for each KPI. In successful forms of cooperation, the target figures for each of the partners will evolve in the ‘right’ direction after the start of the cooperation. These KPIs need to be monitored and a management feedback mechanism should enable their periodic follow-up. The KPIs give an indication of the success and therefore also of the viability of the cooperative relationship. It is therefore logical that their evolution needs to be discussed amongst the partners with great regularity (e.g., weekly or monthly, depending on the intensity of the cooperation). The KPIs with the highest practical relevance for horizontal cooperative relationships are typically related to financial aspects (costs and benefits), level of activity, equilibrium, dependency, performance, customers and growth.

Because of their ability to affect mutual trust, tensions and conflicts can have a bad influence on the durability of the cooperation. In other words, dynamic networks require dynamic management (Thorelli, 1986). Two types of conflicts can be distinguished:

- **hard conflicts**: these are conflicts concerning strategical, operational, financial or technological aspects of the cooperation
- **soft conflicts**: these conflicts are related to interpersonal or business cultural aspects of the cooperation.

It is almost impossible to exclude conflicts of cooperation completely, but it is possible to protect the partners against them or to reduce their frequency by implementing certain rules and control mechanisms. Hard conflicts can be avoided or weakened by increasing the predictability and the transparency of the cooperative relationship. In this way, the partners can increase the amount of trust underlying the partnership. Concrete best practices, which have been identified in this context, are:

- organise regular face-to-face meetings
- prepare and distribute written minutes of all meetings and agreements between the cooperating parties
- isolate the hard conflicts strictly from soft and personal conflicts
- prepare clear guidelines and policies in terms of the financial control and accounting transparency
- make sure that clear rules and agreements are implemented concerning the protection of intellectual property (technology, knowledge or customers)
- share all relevant information on the evolution and performance of the cooperative relationship.

Soft conflicts are less material, which makes them more difficult to detect and manage. In addition, their emergence and mitigation mostly run over a longer time period. They could, for example, emerge in the context of international horizontal cooperation, when the salaries of the employees in one country are remarkably higher than the salaries of the employees of the partner in another country. They could also result from cultural or language differences between partners. A detailed discussion of the soft conflicts lies beyond the scope of this research. Some useful insights concerning the role of soft factors in cooperative relations can be found in the sociological or psychological literature (e.g., Jones, 2004; Mulder et al., 2005).
4.4.2 Evolution and growth

Implementing horizontal cooperation is not necessarily a one-time exercise. It can be the starting point of a continuous change/update mechanism of strategy, skills, organisational structure and company culture (Radcliffe, 2001). Mostly, the full advantages of horizontal cooperation will only be realised after a number of attempts and therefore efficient change management is important for the cooperation initiative to survive.

It is advisable that inexperienced companies start with a ‘light’ form of horizontal cooperation that they can extend gradually when they get to know their partner(s) better and some successes have been achieved (Anderson and Cryer, 2003). Light forms of horizontal cooperation are mostly focused on quick gains and cost reductions. The relationship between the partners is characterised by both trust and mistrust. Light projects are usually short term and involve strong mutual monitoring. These cooperation projects will often be repeated or phased out in function of the achieved success and the established trust between the partners.

Logically, the success of the first phases of cooperation determines whether the project will stop or continue. If results have been positive for a longer period of time, the management and staff of the cooperating companies will get to know each other better and the level of trust will increase. Impediments for intensification of the cooperation are reduced, because partners will consider each other to be consistent and reliable. The increased commitment of all partners facilitates putting more resources at the disposal of the cooperation. Cooperations that are more tactical or strategic in nature then come within reach (Bleeke and Ernst, 1995; Ellram, 1995).

5 Validation of the framework

This paper provides recommendations to assist LSPs in building and maintaining well-functioning horizontal cooperative relationships over time. Starting from a classification of the different forms of horizontal cooperation (see Section 3 and Figure 2) LSPs can map the current state of their horizontal cooperations in terms of the decision level, competition, assets and objectives. By making the characteristics of the current situation explicit, LSPs can evaluate whether this corresponds to the desired state of the horizontal cooperation, and – in case of deviations – which actions need to be taken to move in the direction of this desired state. Therefore, this paper proceeds with a stage-wise approach to help LSPs throughout the life cycle of the horizontal cooperation (see Section 4, Figure 3 and Table 1).

The framework developed in this paper has successfully been used by the Flanders Institute for Logistics (www.vil.be) to guide the cooperation process of four Flemish industrial companies located in the town of Beerse (http://www.metallo.com, http://www.campine.be, http://www.wienerberger.be and http://www.leyesen.org). Each of these companies considered the management of international material flows to be a core competence, with Leyesen describing itself as an LSP. For environmental reasons, the four companies wanted to consolidate shipments to use container barging instead of road transport. At the start of this consolidation project, no cooperation whatsoever was in place. Through in-depth interviews, the objectives of the cooperation for each partner were mapped out in terms of the characteristics displayed in Figure 2. This led to the necessary Strategic Positioning of the desired cooperation (Figure 3). After agreement of
all partners involved, a GO decision was taken towards the formal design of the horizontal partnership. In terms of its implementation and moderation, the partners scored the cooperation in terms of weak points and points that deserve attention in the future. A continuous monitoring system (as suggested by the management and control features in Figure 3) was also a crucial aspect leading to the success of the partnership. The framework thus proved to be a pivotal instrument and helped to structure the building and maintenance of the horizontal cooperation between the partners, resulting in a modal shift of over 20 million tonne-kilometer on an annual basis.

6 Conclusions

The contribution of this paper is threefold. First of all, it presents an overview of the most important motives that LSPs may feel to start up a horizontal cooperation. These motives can be both internal and external to the company. Horizontal cooperation may e.g. help to cope with difficult market circumstances such as strong demand fluctuations, new competition from Eastern European LSPs, and the customer requirement of one stop shopping. Horizontal cooperation can also be used to pursue ambitious company goals such as serving new geographical regions, improving customer service, and a better utilisation of existing infrastructure and assets. In practice, this diverse collection of motives has given birth to a whole range of heterogeneous cooperation initiatives. Secondly, a classification supporting LSPs in their search for a suitable structure for cooperation is developed based on distinguishing cooperation characteristics encountered in practice. When this choice is made, the dynamic process of cooperation in practice begins. The third contribution therefore consists of a description of the life cycle of cooperation. This life cycle is divided in four phases: Strategic Positioning, Design, Implementation and Moderation. Each of these are necessary phases and in turn consist of multiple tasks that should be carried out carefully in order to make the cooperation a success.

This paper aims at stimulating cooperative behaviour in the currently highly fragmented and competitive European logistics sector. We believe that this is a useful, and maybe even necessary, step that LSPs can take to cope with the increasingly difficult market conditions. A positive side effect of collaboration is that society and the environment will benefit from reduced (empty) mileage and congestion.

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