

DEPARTMENT OF ENGINEERING MANAGEMENT

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through different concessions**

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RESEARCH PAPER 2013-018
SEPTEMBER 2013

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D/2013/1169/018

Draft Paper

Improving horizontal logistic co-operation through different concessions*

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June 2012

Abstract

Purpose When collaborating, partners inevitably suffer changes in the way of working, costs or service aspects. However, some changes are easier to implement than others, and can be (easily) compensated by the positive effects of collaboration. This paper aims to give an overview of the concessions that early collaborators in Belgium have made or are willing to make in order for the collaboration to succeed.

Design/methodology/approach In-depth interviews with six managers of forwarding companies in Belgium have been conducted. Five of these managers are already involved in logistics collaboration projects, a sixth does not believe in horizontal collaboration.

Findings Our research shows that companies are not unwilling to execute changes when entering a logistics collaboration project. Cost increases are the most difficult to accept, while changes in the organization of processes and the supply chain are often the preferred kind of concession. Service level aspects can also be changed, however, which kind of aspects is highly dependent on the characteristics of the partner. Moreover, negative impact on one aspect of the service has to be compensated by an improvement in service level on another aspect.

Originality/value This research offers new case studies regarding horizontal logistics collaboration projects. The focus of this research is –in contrast to the main literature focusing on the adoption and start of horizontal cooperation– the actual execution phase. The insights of this research can act as a guideline when discussing the execution of horizontal logistics cooperation.

*Research funded by a Ph.D. grant of the Agency for Innovation by Science and Technology (IWT)

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1 Introduction

To increase the efficiency of their supply chain, companies are increasingly looking beyond their borders (Ireland and Bruce, 2000). Many find opportunities for collaboration with the companies up- and downstream in the supply chain, in so-called *vertical logistics collaboration* (Barratt, 2004). However, more and more companies are searching for partners on the same level of the supply chain, to start up *horizontal logistics co-operation*.

Horizontal logistics co-operation is defined by Cruijssen et al. (2007b) as “the identification and exploitation of win–win situations among companies that are active on the same level of the supply chain in order to increase performance”. This definition implies that horizontal co-operation aims to create *gains for all participants*.

The gains that co-operating partners achieve tend to surpass an increase in cost efficiency or an improvement of the service level. The supply chain of the future, according to Capgemini and Global Commerce Initiative (2008), is a co-operative supply chain, as it has to respond to new challenges such as reducing the amount of traffic congestion, noise levels, and greenhouse gas emissions. The gains of co-operation are indeed legion, and several pilot projects and case studies have already shown that supply chain performance can be increased with respect to multiple criteria when co-operating. An overview of different initiatives is discussed in a previous paper (Vanovermeire and Sørensen, 2011).

Nevertheless, horizontal co-operation does not only create benefits. A first literature review (Cruijssen et al., 2007b) and several surveys (Cruijssen et al., 2007a; EyeforTransport, 2010-2011) show that many barriers exist that impede the acceptance of horizontal co-operation. According to Cruijssen et al. (2007a), the most important ones are

- Finding the right partner;
- Determining and dividing the gains;
- Unequal negotiation positions from partners;
- No adequate information and communication technology in place.

Current research, however, only focuses on the reasons why companies decide to *start* (or not start) co-operating. When the decision to co-operate has been taken, there are still many phases in which a company may experience difficulties. Ham et al. (2006) have defined four phases, each with different goals to be realized in order for the co-operation to be successful:

1. *Start-up*: The collaboration is formed. Partners are found and negotiations begin.
2. *Feasibility study*: The positive and negative impacts of collaboration on the different partners are studied.
3. *Preparation of a pilot study*: Legal issues are addressed, the stakeholders are informed. The pilot study is aligned with the logistic processes.
4. *Live pilot study*: The collaboration is operational on a daily basis.

Most of the current literature focuses on the first phase of horizontal co-operation. However, most coalitions will experience problems and barriers during all phases. Our research focuses on stages 3 (Preparation of a pilot study) and 4 (Live pilot study). In order to be successful, Ham et al. (2006) state that when preparing a pilot study, it is crucial that the discussion on the operational changes that the different partners will have to accept is addressed in a timely manner. When the pilot study goes live, it is important that when one partner is dealing with problems or changes, the other partners are patient, understanding and flexible.

In both of these phases the daily operations of all partners will evidently be affected. Adapting to a new partner implies changes in the way a company works internally and externally (i.e., towards its clients). Very likely, the partners in a coalition will also incur additional costs. Such concessions are often undesirable from the viewpoint of a single partner. However, adjusting to the partners in the coalition is a necessary condition for a successful collaboration. The question is therefore not whether the partners will change their way of working, but rather, how and to which extent they will allow concessions that will create and enlarge the co-operative benefits.

For this reason, insight in the concessions and the reluctance to accept them is crucial. We define concessions as *(negative) changes to its logistics process that a partner makes or experiences in order to increase the coalition gains.*

Concessions can take many different forms. In Vanovermeire and Sørensen (2011), we show that relaxing the requirements of the operational planning (like, e.g., allowing order deliveries to be shifted in time) creates additional gains for the total coalition. More importantly, such concessions are also shown, subject to the use of an adequate cost allocation (or gain sharing) method, to benefit each company individually. In a given coalition of three partners, we demonstrated that the gains increased by 2% when the partners allowed the pallets of an order to be delivered in different trucks. The gains could increase by 16% when an order did not have to be delivered on the delivery day itself, but on any given day in that week.

Through a combination of a literature review and a set of structured interviews, this paper aims to list different types of concessions that companies in a horizontal logistics co-operation are likely to make or experience. By investigating which changes companies are willing to implement or have implemented, we show where opportunities lie for improvements in the collaborative supply chain. This paper also discusses to which extent companies are reluctant to change their way of working, or for which concessions adequate compensation is necessary.

This paper is organized as follows. First, we investigate the existing literature in order to find possible changes in a company's logistics operations that have a negative impact (see Section 2). In Section 3, we explain how we selected and conducted our interviews, which are presented in Section 4. We present five detailed case studies and show which changes have been made when horizontally co-operating. One additional case study is included, a description of a company of which the manager is not willing to accept the changes that come with co-operation. In Section 5, we give an overview of the concessions that occur in these case studies, as well as additional concessions the interviewed managers would consider.

2 Literature review: Concessions

According to a study of EyeforTransport (2010-2011), one of the main motivations for companies to co-operate is to reduce their operational costs. However, many companies can be found that are not driven to collaboration by cost reduction, but are trying to increase their service level, or create a more sustainable supply chain. It is interesting to investigate whether these companies would (or do) allow a cost increase in order to achieve these goals.

When considering a change in cost, it is important to note that the cost of a company's logistics operation does not only consist of its transportation cost (Gunasekaran et al., 2001). The management of the logistic operation (staff wages or investments in information technology), as well as inventory costs are to be included when calculating the total logistics cost.

As service level is a driver for a subgroup of partners, but perhaps not for all, the same reasoning can be applied. It is possible that companies that aim to achieve a cost reduction are willing to change service level aspects. We investigate whether the service level aspects proposed by Bottani and Rizzi (2006), i.e. an increase in lead time, less drops, less predictability, and an increased risk of physical damage, can be affected — positively or negatively — by horizontal co-operation.

Furthermore, several cases studies have shown that both the organization and the execution of supply chain operations change when companies enter into a horizontal logistics collaboration. In Le Blanc et al. (2006), for example, a consolidation hub needs to be included in the supply chain. Moreover, in order to plan inventory collaboratively, information regarding demand and stock has to be exchanged. In the case study of Frisk et al. (2010), where eight wood shipping firms collaborate and barter wood (i.e. wood can be exchanged when the stock of one company is better located than that of the others), an IT system that plans the transportation as well as the exchange of wood has been installed. The case study presented in Vanovermeire and Sörensen (2011) shows many changes in the execution of the transport, such as order splitting, a change of logistics service provider (LSP), and a change of transport mode. Although in this case, the change of transport mode is not regarded as negative, the research of Danielis et al. (2005) shows that forwarders have specific preferences regarding their transport mode, and change on this aspect can therefore be undesirable.

3 Methodology

To determine the concessions that companies make when entering a horizontal logistics collaboration, as well as other concessions that they might consider, we have conducted in-depth interviews with five managers who have been involved in horizontal co-operation pilot projects. Additionally, we have spoken to one manager who is opposed to horizontal collaboration for specific reasons.

Each interview lasted between sixty and ninety minutes. The interviews were conducted in a semi-structured way. The list of topics or possible changes was based on the literature review

Table 1: Characteristics of the case studies

Case study	A	B	C	D	E	F
Sector	Fast-moving Consumer goods	Pharmaceuticals	Food	Petrochemicals	Agriculture	Textile
Size	Large	Large	Large	Large	Small	Large
Type of col-laboration	Mutual ware-house and dis-tribution	Bundling for long-haul and modal shift	Bundling for long-haul and modal shift	Build rail/road-terminal	Creating round trips	—
Number of participants	3–4	2	4	3	9	—

of Section 2. For each topic, we thoroughly questioned the reasons and motivation behind the choices made. Ample time was provided to make further enquiries when unexpected facts arose (Sampson, 1986). To increase the reliability of the interview, the results were reported back to the interviewees.

We focused on horizontal co-operation projects of forwarders. The forwarders were chosen from different sectors (see Table 1 for details on the different case studies). As the companies in the case studies are very different in size, sector, and even in the type and scope of their co-operation, only some very general conclusions can be made. It is not possible to simply extrapolate the findings of one company in, e.g., the food industry to other companies in the same or other sectors. This research is therefore exploratory, to provide a good overview of concessions that companies are likely to make, and the reluctance towards them. The results from this research should be verified through surveys on larger scale.

4 Case studies

4.1 Case A

The first interview is conducted with a manager of a large international company producing fast-moving consumer goods. It has both business-to-consumer (B2C) as well as business-to-business (B2B) products. As personalized service is of the highest importance in the B2B-segment, co-operation in this segment is not seen as a viable option.

Two pilot studies have been started by this company in the B2C segment, the first involving three competitors, the second involving two. In these pilot projects, finished products of the partners are directly transported from their plant to a mutual warehouse by a commonly agreed upon 2PL (Second-party logistics provider). From this warehouse, the products are delivered when a customer order is received. The aim is to send out full truckloads, but the main consideration remains the service level that is required by the customer. However, the companies consider

service level concessions (e.g., a lead time increase) on the condition that the customer agrees. This is coordinated by an external consultant.

The main objectives of the co-operation are a decrease in distribution costs and a higher service level. The bundling of the orders has indeed decreased the total cost. However, as each project requires another warehouse, this has resulted in an increase of the warehousing costs. Another project involving another warehouse will therefore not be accepted any more.

As a result of the co-operation, the service level has increased. As a full truckload (FTL) can now consist of orders of all companies, the orders can be smaller and the delivery frequency can be increased. This decreases the holding cost for the customer. Moreover, the handling costs decrease as fewer trucks arrive at the customer. Finally, the combination of a higher delivery frequency and a reduced distance to the customer ensures that the company can react faster to the changes in demand.

In Table 2, an overview is shown of the benefits, but also of the concessions that had to be made in order to achieve these benefits.

Table 2: Benefits and concessions in Case A

Benefits	Lower costs Improved service <ul style="list-style-type: none"> - Increased frequency of delivery - Smaller delivery volumes - Less handling for the customer - Higher reliability
Changes	Higher warehousing costs Re-organizing the supply chain (warehouse closer to client) New logistic partners Communication with external party (consultant)

4.2 Case B

Company B is a larger player in the pharmaceutical industry. Its main strategy is to be a niche-player. Therefore, its average order size is often small. However, distributing pharmaceutical goods is expensive, as the right temperature needs to be maintained during transport and the products are perishable. For this reason, horizontal co-operation seemed to be a promising idea.

The co-operative supply chain was organized as follows. The orders are collected at the sites of the partners. They are then sent out by train to Romania. There, they are picked up and brought to their destination, a warehouse of a 3PL (third-party logistics provider) who serves hospitals and wholesalers of pharmaceuticals.

A co-operation project with a larger competitor bundles their transport to Romania. This company already has many FTL's. However, by postponing the delivery of some pallets, it is possible to

combine orders of both companies in a single truck. Postponement of the pallets is possible as the number of drops has increased and the 3PL is guaranteed to have enough stock to supply its customers.

As the products of the company are lighter than those of their partner, goods can be stacked and the load factor can be increased. To be able to stack however, the packaging needed to be changed.

The aim of this project was twofold: to obtain a higher service level and a greener supply chain. The distribution costs, however, were not allowed to increase. The larger volume allowed for a more frequent supply of goods. As their products are perishable, this reduced the risk of being out-of-stock from the customer's side, as well as the need for expensive speed-deliveries.

The larger volume also allowed to shift transport mode. The deliveries are now collected at the sites of the producers, and are then brought to a terminal to be transported by rail to Romania. This modal shift reduced the greenhouse gas emissions by more than 50%. To realize this shift, a new logistic provider was included in the partnership.

Finally, an external party is involved to manage the consolidation. The order and delivery processes needed to be revisited and are now controlled by the external party. For this service, both partners are charged. Table 3 lists the benefits and concessions of this case study.

Table 3: Benefits and concessions in Case B

Benefits	Improved sustainability Improved service - Higher frequency of delivery - Lower out-of-stock risk
Changes	Change packaging Re-organizing processes and new systems Split orders Stacking of pallets New logistic provider Communication with external party

4.3 Case C

Company C is a larger company in the food industry that ships frozen products from Belgium to Italy. This company aims to provide an excellent service to its customers.

As the transportation of frozen products is not environmentally-friendly, this company has decided to tackle the challenge of reducing its ecological footprint by forming a coalition with three competitors in order to ship its frozen products via rail. The bundling is organized by a neutral party, and a 2PL organizes the transport.

Even though the main objective of the collaboration is to reduce the ecological footprint and to realize a modal shift, the cost reduction due to a larger load capacity and negotiation of a fixed price for deliveries from the train station to the customer (in a 150 km radius) also positively impacted the decision to collaborate.

To negotiate this fixed price, the maximum number of delivery addresses needed to be reduced. The transition to rail also forced this company to change the type of pallets.

One of the main difficulties experienced by company C was to give up control of the transport. This company generally organized 70% of its deliveries itself. Because the transport is now organized outside the organization, there is an increased risk of delays and thus a lower service level. This was mitigated by implementing an information system that can track the status of each delivery. A possible delay can thus be communicated faster to the client.

Benefits and concessions in Case C can be found in Table 4.

Table 4: Benefits and concessions in Case C

Benefits	Improve sustainability Minimize costs
Changes	Change packaging Maximum in number of delivery addresses Increased risk of delays (loss of control) New information exchange system

4.4 Case D

Company D is a large player in the petrochemical industry that has taken the initiative to invest in a rail/road-terminal and the complementing IT-infrastructure, in collaboration with two logistics service providers who specialize in intermodal transportation. The aim of this initiative is to facilitate the shift from road to rail, and the main motivation to achieve this modal shift is to increase the company's score on sustainability indicators. However, the company stresses the fact that collaborative initiatives are always evaluated against cost and quality of transport.

The terminal is freely available to other companies at a certain price. This is therefore not a strategic partnership like the previous case studies. To consolidate the orders of all users, a fixed route is used. The users can then decide whether they wish to ship their orders via this route at that price.

Company D generally organizes its transports itself, through its own logistics department. By owning a part of the terminal infrastructure, it does not lose control over the transportation of its goods. There are thus no negative changes to be reported. However, it considers that cost allocation could be an issue in other co-operative projects, as many cost allocation methods give a comparative advantage to companies with a small volume. Cost allocation methods based on the

amount of volume shipped disfavour large companies. Cost allocation methods that attempt to distribute the gains in an equal manner will attribute very high relative savings to small partners.

Table 5 lists the benefits resulting from this collaborative effort.

Table 5: Benefits and concessions in Case D

Benefits	Improve sustainability Minimize costs
Changes	–

4.5 Case E

Nine tree-growers started a project to organize the final round-trip distribution of trees and plants. Because their customers are geographically dispersed and their orders are irregular, the load factor of their trips is very low and the transport is very expensive. Moreover, it is difficult to find logistic service providers that allow such “dirty” transport. Reluctantly, the transportation is thus organized and performed by the companies themselves.

In the collaboration started by these companies, collecting all the goods at the growers, and organizing round trips including customers of several companies, total transportation cost could be significantly reduced. Moreover, distant customers can now be reached at a reasonable price. Finally, the overall service level was increased. The bundling of orders ensured a round trip twice a week, which implied a reduction in lead time for most growers, and a larger predictability of the delivery. However, as the delivery dates are less flexible in this setting, the lead time has increased for some growers.

For all growers, the loss of personalized services is the largest disadvantage to this project. Being small players, a good service and personal touch are very important for these companies. By not delivering the goods themselves, they have less personal contact with their client. However, they gain more time to focus on their core-business instead. Finally, the packaging needed to be standardized to be able to load efficiently.

Concessions and benefits from this collaboration are listed in Table 6.

4.6 Case F

The last company is a large textile company. The low-cost production from Asia forces this company to excel in service, and the most important aspect of this is a short lead time. Customers fully expect very short delivery times after ordering their product and are willing to pay for this. After ordering a product, the order is thus directly (produced and) shipped to the customer, and according to the interviewee, there is no time to insert an additional intermediate consolidation phase.

Table 6: Benefits and concessions in Case E

Benefits	Minimize costs Upgrade service <ul style="list-style-type: none"> - Higher frequency of delivery - Deliveries are more predictable - Lower lead time Focus on core business
Changes	Higher lead time Less flexibility in delivery date Loss of personal service Change packaging

Moreover, to be able to stay competitive, company F believes that it is vital to further focus on personalized services. The company feels that this is much more difficult to achieve in a horizontal logistics collaboration.

Finally, there is doubt whether horizontal co-operation — in the form described in the paper — will have significant additional benefits as compared to the bundling that can be provided by a third party logistic provider.

5 Possible changes in horizontal logistics co-operation

When faced with all the possible changes that co-operation might cause, the willingness to accept such concessions is very different from company to company. None of them however accept a higher *cost*. Although most companies could allow a shift in costs — A and D might allow a higher inventory cost while C, D, and F are willing to hire extra staff when compensated with a lower transportation cost. Moreover, some companies are willing to invest in IT-infrastructure. —, the main goal for all companies is to lower the total cost, or at least, to not increase it.

Concerning the changes in *service level*, none of the companies agrees to a higher risk of physical damage. However, we can see in Table 7 that some companies will accept a reduction of the quality of some service level aspects. Company B, D, and E will consider projects that involve a higher lead time to the customer. However, a condition to be met is that the predictability of the moment of delivery for the customer is high. Moreover, an agreement has to be reached with the customer on the delivery frequency. All companies except company F allow a reduction in the number of drops. A higher predictability and an agreement from the customer can, for this service level aspect, mitigate the negative impact on the overall service level. The response of company B is interesting, as one of its main goals was to decrease the lead time to the customer and increase the number of drops. However, it values predictability to the extent that it has allowed an increase in lead time in exchange for a higher predictability.

The changes in service level that a company allows are dependent on the sector, its product, and its strategy. Company C, e.g., delivering perishable goods, is less inclined to allow a longer lead time. Company F on the other hand feels that the pressure of the competition does not allow it to give in on any aspect of service level.

Specifically for companies that have to offer personalized services to be competitive (company A in the B2B-segment, company E, and company F), it is difficult to co-operate. However, for company E, as transportation is very difficult and expensive to organize, the large benefits are deemed to be enough to compensate this loss. Company E feels that in the end, the time saved by not organizing transport itself can be spent on their core business, and the service level has increased because all customers can be reached and deliveries can be better predicted. Moreover, the reduction in costs is very high in this case.

In general, the companies that are willing to co-operate are open-minded to change the manner in which the transport is *organized* and *executed*. In this section, we have seen that the number of possible changes is large, as well as the differences between companies. For example, company A — a FMCG-manufacturer — is subject to laws and European standards concerning packaging. This company is thus less willing to change the packaging. Whether a company will allow its products to be stacked, is highly dependent on the product (weight, material...). Which information they are willing to share is very dependent on the culture and on the partner they will co-operate with, and so on. Previous investments will also influence the decision to co-operate. For example, company A has recently investigated other transport modi and is not likely to increase the number of transport options. Finally, Company D is reluctant to split its orders. It considers its high volumes to be one of its main advantages to negotiate better prices with logistics providers, to enable the modal shift, . . . Splitting the high transportation volumes might undermine this negotiation power.

6 Conclusion and Future work

In conclusion, companies are not unwilling to accept concessions when entering a logistics collaboration. Changing to adapt to the partners in the coalition is vital and is needed to create co-operative benefits.

Although cost reduction is not the main goal of all co-operating companies, none of them are willing to accept a higher total cost. Some of the partners allow to shift certain costs, or are willing to make additional investments, but conditionally, expecting a return-on-investment in a reasonable time-period. For a lot of companies, a higher inventory cost is non-negotiable, even when compensated by a lower transportation cost.

Changes on certain service level aspects are possible. However, the final benefits need to be large, and the companies interviewed also expect that concessions on certain aspects on the service level need to be mitigated by an increase of the service level on other aspects. In general, most companies expect a higher service level when co-operating.

Changing the organization and execution of the transport is the type of flexibility that is most likely to be accepted. There are many possibilities, and it is very dependent on the organization. Therefore, a long-term relationship is needed, to communicate properly, to look continuously for possible improvements, and to be sure that investing in the coalition will result in long-term benefits.

To enable horizontal collaboration, there are many challenges for the future to be derived from these case studies. First of all, people are willing to adapt to enhance profits, but only when they believe that the profits outweigh the efforts. There is thus a need for more information and for pilot projects that show the various benefits that horizontal collaboration can provide.

Moreover, it is clear that horizontal collaboration exists in many forms, which implies that the changes needed for implementation differ as well. This is positive, as many companies have different customer demands, processes, culture, . . . These differences are reflected in the concessions that companies are willing to make, and in the flexibility that they are willing to allow. Our research provides a first overview of these changes. This overview can be used as a guideline when discussing the implementation of horizontal collaboration. However, a more complete overview, including sector differences, is a next step in our research.

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Table 7: Changes noticed at the participants when implementing horizontal cooperation

	A	B	C	D	E	F
Costs						
Stock	±	-	-	±	--	--
Transportation	--	-	-	-	--	--
IT	+	±	bus. ¹	bus.	-	bus.
Staff	-	-	bus.	bus	-	bus.
Service						
Lead time	±	+	--	+	+	--
Drops	±	++	+	+	+	--
Predictability	--	--	±	-	-	--
Risk of physical damage	--	--	--	--	-	--
No personalized services	±	+	+	±	-	--
Organization & Execution						
Re-organizing supply chain (processes)	+	+	±	+	+	--
Packaging	--	+	±	+	+	+
Stacking	+	+	+	+	+	-
Split orders ²	±	+	+	--	+	--
Transport mode	--	+	++	+	+	+
Logistics partner	±	+	±	+	+	+
Communication external partner						
- Demand	+	+	++	--	+	++
- Stock	++	--	++	++	+	++
- Production	--	--	++	--	+	--

¹ Business case: Investment only when there is a reasonable Return On Investment.

² Can also be categorized under "Changes in service level"

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