



## The potential of horizontal collaboration in airport ground freight services



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### ABSTRACT

Since the global economic crisis of 2007–2011, the increasingly dynamic and challenging air cargo market in Europe has forced freight forwarders to improve their performance. In addition to improving their internal transport efficiency, they have also started to look at previously unexplored opportunities for horizontal collaboration in landside airport transport. The aim of this study is to reveal the potential of air cargo transport collaboration on a horizontal level, i.e. between multiple freight forwarders within a single airport. Reviewing existing literature on horizontal collaboration, with a focus on the air cargo industry, we propose a conceptual framework for transport collaboration in the air cargo industry. Based on a comprehensive study on air cargo transport movements within Schiphol, using a simulation model based on company data of 10,747 shipments (6977 tons of cargo) for a period of 30 days, we find several interesting results. Our main finding is that horizontal collaboration can improve the transport performance, by maintaining a high frequency of transport movements and maintaining an acceptable throughput time for air cargo shipments, and at the same time reduce transport costs by up to 40%. For smaller freight forwarders, the frequency of transport deliveries can even increase, while still allowing them to improve the average load factor of transport movements.

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### 1. Introduction

Traditionally, large global shippers of goods have developed and supported their transport needs internally (Sahay, 2003). In the last 30 years, however, many have started to collaborate with other companies within their own supply chain with regard to transport organization-related activities (Mason et al., 2007). This type of vertical supply chain collaboration has matured in recent decades, especially in well-developed regions like Europe and/or North America. Vertical collaboration involves two or more companies that do not operate on the same level of the value chain. This practice is already well established in highly competitive industries, even to an extent that achieving a competitive advantage by applying only vertical collaboration is often no longer a sufficient strategy.

In many industries today, legal and/or operational constraints make it more effective to organize transport individually, delaying a

shift in focus toward transport collaboration in general. In addition, different products require a different approach to fit customer requirements (Jüttner et al., 2007). Vertical transport collaboration may be justified when both the volume and frequency of shipments between companies are high. Also, when the value and nature of the products requires more of a restricted control of transport, vertical collaboration is a demanding proposition. Finally, the exchange of information is often affected by complexities and risks. Even within companies, the cost of sharing information is still often an obstacle, companies or internal departments are often reluctant to share information (Barratt, 2004), for fear that could result in revenue losses, from the information itself, from the costs of sharing information (GCI, 2009) or because of legal and technological constraints.

In industries where customer preferences and transport requirements have become more challenging in recent years (Capgemini, 2010; Pyza and Golda, 2011), production flows between major manufactures and consumer markets around the world have become smaller and more dynamic (Maskell, 2001). As a consequence, the organization of individual supply chains and their transport has come under more pressure. Increased energy costs, stricter government transport regulations and a broader focus on sustainability have also challenged the effective

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management of supply chain by applying only vertical supply chain collaboration with a supply chain.

Horizontal collaboration involves companies that operate at the same level of the value chain, but usually in different chains. They collaborate by sharing capacity, planning, handling services and possibly even booking services. This kind of collaboration takes place among shippers who produce goods and freight forwarders or carriers who arrange the transport of goods for shippers. In several of the largest good production industries, including the fast moving consumer goods sector (FMCG), major manufactures have started to collaborate with (direct) competitors on transport, to reduce transport cost, increase the delivery frequency and meet the higher sustainability requirements. Recent horizontal transport collaboration projects in Europe have shown that transport costs can be reduced by more than 20% through horizontal collaboration (Vanovermeire et al., 2014), while at the same time improving other important transport performance aspects, such as; reliability, transport management, the resources needed to process goods and the environmental impact.

Following the lead of the manufacturing industry, two important developments have motivated the air cargo transport services industry to start looking at possibilities for horizontal collaboration. Firstly, in the decades prior to the economic crisis, high economic growth rates and healthy operations margins had limited the need and support for transport collaboration in the air cargo transport system. Freight forwarding companies in the air industry were able to: (1) optimize their supply chain in a cost-effective way by using their own resources, (2) realize efficiency through vertical transport collaboration or (3) justify inefficiency based on relatively high operational margins. The increased competitiveness within the air cargo industry, with other transport systems and declining operating margins of air freight (IATA, 2012), have made it more difficult for freight forwarders to maintain an acceptable level of transport performance, measured in transport costs per kilo cargo. Secondly, the emergence of the integrators, or integrative logistic service providers (including freight forwarding companies within the air cargo system), has put substantial pressure on the competitiveness of specialized service providers (Capgemini, 2010). Couriers, postal companies, integrators, airlines and forwarders increasingly compete on several markets based on size, volume and services, offering shippers a much wider choice of services for transport by air, making the air cargo market much more dynamic and complex. This is expected to continue in key international markets, adding to complex interaction and co-competition between integrators, the largest providers of express capacity and traditional air cargo airlines.

A major limitation of existing studies on horizontal transport collaboration is that they focus mainly on long distance transport collaboration. In addition, collaboration in other transport systems has focused on goods that are not subject to the dynamics of demand and supply that characterize the air cargo system at a given airport. Thus far, existing studies are unable to provide a single example of horizontal collaboration within an airport air cargo transport system, despite successful applications in other transport systems. The distances of inner-airport cargo transport are relatively short, which could also provide new insights into short-distance horizontal transport collaboration.

The main contribution of this paper is to show the key effects of applying horizontal collaboration to inner-airport transport air cargo shipments, based on a comparative case study analysis of the performance of single and combined transport within an airport system. As such, this study can further support the understanding of combined transport in dynamic short-distance transport systems.

The rest of this paper is organized as follows. In the next section, relevant literature on supply chain collaboration is analyzed. Section 3 points out the most important current and future developments of the air cargo industry in relation to collaboration in terms of inner-airport transport, resulting in a conceptual model for this type of transport collaboration. The case study involving collaboration at Schiphol is presented in Section 4. Finally, in Section 5, our conclusions, the managerial implications and suggestions for further research are presented.

## 2. Review of literature

Although previous studies acknowledge the importance of collaboration in transport in general (Stephens, 2006; Mason et al., 2007), only a few focus on horizontal transport collaboration, while most focus on vertical supply chain collaboration (Holweg et al., 2005; Visser, 2009; Sahay, 2003). There has been little attention to horizontal transport collaboration in relation to real-world problems (Cruijssen and Solomon, 2004; Audy and D'Amours, 2008; Vanovermeire et al., 2014), nor is there often a focus on extensive and complex transport collaboration, which can in part be explained by the traditional focus of supply chain management on reducing transport costs rather than on the potential added value of transport within a supply chain, as has been pointed out by Mason et al. (2007).

Generally speaking, when the focus is on cost reduction, relationships between companies tend to be short-term and purely operational in nature. Often, these types of relationships are not defined as a true form of collaboration but rather as arm's length relationships. At the moment, there are many challenges that have limited the actual intended impact of vertical and horizontal collaboration (Barratt, 2004). Recent research that looked at important variables that are related to supporting and managing supply chain collaboration suggests segmenting the suppliers based on their 'capabilities' and 'willingness to collaborate', in order to formulate particular relationship strategies for different segments of suppliers. The segmentation helps the companies to better manage their relationship with their key partners (Rezaei and Ortt, 2012, 2013). When applying and managing transport with two or more companies operating at the same level of the value chain, this often requires longer term relationships, to justify and support this type of transport, given the notion that it can be more complex to establish and maintain such long-term relationships (Stephens, 2006). This can be further explained by the research by Lambert (2008), which defines different levels of relationships between companies, based on the extent and goal of the collaboration in question, pointing out the most important aspects that determine to what extent a partnership is based on the facilitators and drivers for a partnership. Key elements in the partnership model relate to organizational comparability, symmetry and trust. Companies currently have more knowledge and experience with regard to vertical collaboration.

However, the benefits of applying horizontal transport collaboration on other important organizational processes, in addition to transport-related aspects are also becoming better known, as has been pointed out by Cruijssen et al. (2007), which can relate to aspects such as the use of company resource, production planning and environmental benefits. The potential of horizontal transport is, therefore, increasing, due to more dynamic markets conditions and changing customer requirements (Leitner et al., 2011). The motivation to support horizontal collaboration is increasing, especially when vertical collaboration cannot achieve similar results or is even more difficult to realize.

The few studies that examine collaboration within the air cargo industry have mainly focused on collaboration between airlines

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