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Logistics Service Providers and Value Creation

Through Collaboration: A Case Study

Xiaobei Wang, Gøran Persson, Lars Huemer

Abstract

Logistics service provider (LSP) strategy and value creation is a cooperative endeavor. The study focuses on how LSPs create value by taking advantage of being connected and exploring the presence of various forms of interdependence. Using a single case study and a framework addressing network externalities and the concept of value logic interaction, we identify three types of collaborative value creation; distributive, functional and systemic. Whereas the fundamental logic of the LSP is mediation in terms of performing a distributive service, it is also subject to externalities in its functional and systemic value creation initiatives. LSPs are thereby portrayed as strategic entities dealing with a set of interdependencies in order to facilitate value creation in their networks. These firms need a rather advanced understanding of different types of economies and forms of collaboration to succeed. The study also associates different types of LSPs with the identified types of collaborative value creation.

Keywords: Logistics Service Provider; Value creation; Collaboration; Interorganizational relationships; Networks

Introduction

Despite their increasing importance,¹ logistics service providers (LSPs) have received minimal attention in the literature on strategic management.² The mainstream literature has commonly defined logistics management as part of supply chain management, and supply chain frameworks tend to characterize LSPs as supporting actors to manufacturing firms and as non-value-adding entities (Rabinovich and Knemeyer, 2006). This suggests that the stream of research on strategy and value creation has tended to overlook LSPs.

Although the number of studies on LSPs has increased, few have addressed value creation; exceptions are Berglund (2000) and Huemer (2006). Berglund (2000) related LSPs' value creation to their functions, and Huemer (2006) related it to their mediating role. Both studies were conducted at the firm level, although they also acknowledge the importance of collaboration for LSPs to create value.

The present paper examines LSP value creation by using the case study of TLog, a fourth-party logistics service provider (4PL) (also known as an asset-neutral LSP), and its partners and clients. The study illustrates three forms of value creation, all of which are collaborative in nature: the linking of actors in the network, the coordination of sequential logistics flows, and the development of the network over time. Building on the collaborative nature of LSP value creation, the study also addresses how LSPs can take advantage of being connected and utilize the various forms of interdependence they face.

The paper contributes to the strategic management of LSPs by viewing them as strategic entities with the capacity to create value. Based on a developed conceptual framework, we identify the three ways in which LSPs create value in collaboration, as mentioned above. We relate different

¹ A recent study showed that 82 percent of logistics executives worldwide considered their companies to be clients of LSPs during 2007; this is an increase of approximately 72 percent from the start of the 2000s (Langley et al., 2007).

² A literature search using Business Source Complete and the key expressions "strategy" and "logistics service providers" (AB Abstract or author-supplied abstract in academic journals) returned only 33 hits, whereas "strategy" returned 106,881 hits.

types of LSPs to these forms of value creation, and highlight the cooperative scope that LSPs have with respect to value creation. On a general level, the study adds to cooperative strategy with a focus on mediation-based business models. The paper ends with a discussion of managerial implications and directions for future studies.

Literature Review and Conceptual Framework

This section provides an overview of generic value creation frameworks from resource and activity perspectives, and at the firm and system levels of analysis, which characterize contemporary strategy research on value creation. It addresses those studies that have focused specifically on LSPs and outlines the development of the study's conceptual framework.

General Value Creation Frameworks. Studies on value creation occur in at least two parallel research streams: activity-based and resource-based studies. These two streams can be further divided into the firm level and the interorganizational level. Firm-level studies stress firm differentiation, indicating that they provide a competitive perspective and emphasize that firms should control either strategic resources (e.g., Barney, 1986, 1991; Rumelt, 1984; Teece, 1982; Teece et al., 1997; Wernerfelt, 1984) or value-creating activities. The interorganizational level of analysis focuses on interaction interfaces. Accordingly, the perspective is collaborative and stresses either combining organizational resources (e.g., Pfeffer and Salancik, 1978), or collaborating across firm boundaries.

The present paper adopts an activity approach. Following such an approach, Porter's (1985) value chain model dominates the contemporary view of firm-level value creation and focuses on sequentially dependent activities. The model favors manufacturing firms that create value by transforming inputs into products, and is less suitable for analyzing service industry activities (Stabell and Fjeldstad, 1998). Based on Thompson's three technologies and different types of

interdependences (Thompson, 1967), Stabell and Fjeldstad (1998) broadened firms' value creation logic into three value configurations: the value chain, the value shop and the value network. The value shop model captures the value creation logic of professional service firms or so-called knowledge-intensive organizations focusing on problem solving rather than the production or sale of physical products. The value network describes how firms based on a mediating technology create value by linking actors who are or wish to be interdependent.

Activity-based studies at the interorganizational level have had different areas of emphasis. The business model concept emphasizes the design aspects of value creation. Teece (2010) noted that business models reflect management's ideas about what customers want and how they want it, plus how the enterprise can best organize to meet those needs, get paid for doing so, and earn a profit. Moreover, business models have been referred to as firms' underlying core logic and strategic choices for creating and capturing value within a network (Dahan et al., 2010; Shafer et al., 2005).

The business model concept emphasizes the design elements of an activity system, such as content, structure and governance, as well as the characteristics of that system. On the other hand, strategic networks (Gulati et al., 2000; Jarillo, 1988) highlight mechanisms with which to realize a specific business model and distinguish the critical role of a focal firm as the center or hub, controlling and orchestrating the network.

Logistic Service Providers and Value Creation. Most of the extant strategic management studies of LSPs have taken a professional service firm perspective. These studies include topics such as competitive advantage and firm performance (Sum and Teo, 1999; Wang et al., 2006; Yeung et al., 2006), strategic positioning (Juga et al., 2008) in terms of classical-based positioning (Bask, 1999; Cooper et al., 1994; Delaney, 1991; Persson and Virum, 2001), resource-based positioning

(Berglund, 2000; Persson and Virum, 2001; Skjøtt-Larsen et al., 2007), and competency-based positioning (Berglund, 2000; Lai, 2004; Hertz and Alfredsson, 2003; Naim et al., 2010), etc.

Berglund (2000) adopted a general service firm's perspective on studying LSPs and identified the four following LSP value creation modes with associated value drivers: operational efficiency, integration of customer operations, supply chain management and integration, and vertical or horizontal network development. Berglund (2000) noted that collaboration is an important value creation mode, while Huemer (2006) acknowledged the mediating role of LSPs. By viewing LSPs as the ones that connect senders and receivers (in line with Thompson's 1967 description of the postal services), the value network model (Stabell and Fjeldstad 1998) is fundamental for LSP value creation on the firm level of analysis.

However, contemporary studies on LSP value creation have revealed little about cooperative efforts. To address how LSPs create value by cooperating with others—an insight that emerged from the case study—we required a theoretical framework that addresses collaborative value creation. The HP model (Håkansson and Persson, 2007) provides such a view. In contrast with work on strategic networks, the HP model does not portray focal firms as centers or hubs in charge of governing and controlling the network. The following section describes the HP model and its development for the purpose of this study.

A Framework of Collaborative Value Creation

Notably, the HP model and the value configuration framework (Stabell and Fjeldstad, 1998) share the same theoretical heritage from Thompson (1967). According to Thompson, the types of technologies used to describe different value configuration logic (mediating, long-linked and intensive technology) correspond to the types of interdependence (pooled, serial and reciprocal interdependence) and to different forms of coordination (standardization, planning and mutual adjustment). Stabell and Fjeldstad (1998) used this framework to define three different forms of

value creation at the firm level, whereas Håkansson and Persson (2007) used it to describe three different types of collaboration on a system level of analysis. Table 1 illustrates the emphasis in the original HP model and two additional aspects that emerged as part of the study's abductive research process. The framework is outlined in the remainder of this section.

Insert Table 1 here

Collaboration and Economizing in Networks. The HP model builds on the network perspective of the Industrial Marketing and Purchasing Group (Håkansson et al., 2009; Håkansson and Snehota, 1989), which emphasizes connectedness and embeddedness as basic features of every firm. Below we elaborate on the various types of economy in the HP model associated with specific forms of collaboration and types of relationship.

First, economies of scale and scope are related to the rationalization role of network cooperation in terms of standardized solutions or assortments of supplies from specialized firms. Second, economies of integration are derived from coordinating interlinked activities among different supply chain actors. This integration can take various forms, depending on the extent of actors' activity adjustments. And third, economies of innovation are related to the development role of network collaboration.

Economies of scale and scope may be achieved through distributive collaboration (the corresponding relationship is mediating). This "distributive" type of collaboration primarily refers to the allocation aspect of the collaboration effort; i.e., the efficient allocation of buying volumes, activities and resources to reduce costs. To this end, the joint capabilities and experience of the participating parties are critical.

Functional collaboration leads to economies of integration by coordinating interdependent activities. This interdependence is particularly evident in serially linked activities such as just-in-time (JIT) deliveries. Considerable joint efforts are required in order to attain economies of

integration. The term “functional” refers to the coordination and adjustment of activities and functions over several company borders in a supply chain. Linking functions across a supply chain can achieve economies of integration and take various forms, such as sharing forecasts or other information, joint planning efforts, joint follow-up and shared performance indicators.

Cooperation can also take the form of a problem-solving relationship involving systemic collaboration. This situation requires adjustments to mutual activities, resource adaptation, and repositioning in the actor dimension. Problem-solving relationships typically have three collaborative elements: knowledge sharing, common performance measurements, and extensive interactions in terms of infrastructure developments or service innovations. In addition, most problem-solving relationships include aspects related to mediating and linked relationships (Håkansson and Persson, 2007).

Network Externalities and Value Logic Interactions. Table 1 includes two important developments of the original HP model: 1) the acknowledgement of network externalities; and 2) attention to the "value logic interactions" (VLIs) that the HP model implicitly reveals.

One advantage of the original HP model is that it identifies collaborative forms of value creation. However, the model downplays the value dimension of the distributive logic, and needs to pay further attention to combinations of interdependencies. To address these issues, we developed the original HP model with an awareness of network externalities and VLIs.

Firms that rely on mediating technology also need to acknowledge positive demand-side network externalities (Katz and Shapiro, 1985). As Stabell and Fjeldstad (1998) implied, the size of a mediator’s network and the way in which the network has been composed regarding customer sets are both cost and *value* drivers. Adding more clients with certain characteristics affects the value of the services offered to other clients in the network. This value argument implies that the utility a given user derives from the service depends on the number of other users in the same

“network”; in other words, adding new users increases the value for existing users in the network under certain conditions.

Whereas network externalities are usually associated with mediation-based industries, externalities impact on all three collaborative forms of value creation in a logistics setting. VLI (Huemer, 2006) addresses how interdependencies may coexist and are related in creating efficient supply or distribution systems. VLI builds on Thompson’s (1967) claim that firms are associated with aspects of what he termed the "technological matrix". For example, a consultant is likely to emphasize the intensive technology (which Thompson described as custom technology associated with reciprocal interdependencies) in order to solve unique customer problems. A manufacturer or retailer that focuses on physical product flows would be related to the long-linked technology (and correspondingly sequential interdependencies), whereas mediators, such as LSPs, would be associated primarily with the mediating technology (pooled interdependencies). VLI emphasizes that, in supply and distribution networks, value creation depends on the entire matrix, involving interplay between mediation, long-linked and intensive technologies.

Correspondingly, by developing the HP model with network externalities for all three collaboration forms and the VLI concept, we become equipped with a framework that facilitates the exploration of connectedness and value creation. This accentuates Håkansson and Persson’s (2007) claim that firms need to take full advantage of being connected, and should explore the use of various forms of interdependence (pooled, serial, and reciprocal, as originally defined by Thompson [1967]).

Data and Methods

The interaction between a phenomenon and its context is best understood through in-depth case studies (Dubois and Gadde, 2002). The present study is based on a single case study of TLog and its partners and clients in the network. We intentionally chose TLog, a typical less-assets-based

administrative LSP (also called a 4PL company) that highlights the relational nature of business interactions since its value creation is dependent on a set of different actors, including physical-asset-based LSPs. TLog is one of the few independent 4PLs (i.e., it is neither owned nor linked to other LSPs or market players) in Norway, which makes it so-called asset neutral.

Our research follows the methodology described as systematic combining (Dubois and Gadde, 2002); i.e., a process through which the theoretical framework, empirical fieldwork, and case analysis evolve simultaneously. Systematic combining is an abductive approach that is particularly useful for refining or extending theories. The main characteristic of this method is continuous movement in terms of matching and direction and redirection among the theory, the empirical world, the analytical framework and the case. The process is nonlinear and path-dependent.

The research group's engagement with TLog's founders goes back to 2000, seven years prior to the company's foundation. One of the paper's authors was given the opportunity to stay at TLog for two months during the summer of 2010, to observe and talk with employees at different management levels. We started by using existing value creation frameworks, including those of Berglund (2000) and Huemer (2006), to understand our research context and phenomenon, and continued to search for other possible theoretical frameworks. Although these two frameworks helped LSPs' value creation, they offered limited explanation of collaboration efforts among different actors. Through a few initial interviews that provided various examples of how TLog's business depended on others, we became more aware of the mismatch between firm-level frameworks and the empirical case. Consequently, we returned to the literature review, broadened our scope, and reviewed value creation literature in general. Among the different approaches and analytical framework levels, we finally chose the HP model, which was developed iteratively, as indicated above.

The data collection process, which entailed a series of informal and formal semi-structured interviews, was completed in October 2010. The primary data in this paper is based on seventeen semi-structured interviews, each of which lasted from ninety minutes to two hours (in addition to numerous informal talks with employees and managers during the two-month stay at the firm). In order to obtain a comprehensive understanding of the business and its various collaborative value creation activities, we included a range of informants, ranging from employees and managers at TLog, to business partners and business managers, and operations managers and operations personnel. The main data dealt with relationships, primarily those with clients and so-called third-party logistics service providers (3PLs). The data coding process categorized TLog's collaborative efforts with various actors, which were then compared and discussed. The HP model, developed in combination with network externalities and the VLI concept, was finally applied to systemize and further analyze the data.

The Case Firm TLog

Traditional logistics operators offer single, specialized logistics services, such as transport operators and warehouse operators (CSCMP, 2010). In general, 3PLs provide integrated operational services to clients, including warehousing, transportation and other logistics activities, whereas 4PLs work across the entire supply chain, and use the services of 3PLs to provide end-to-end solutions for clients and often to control the flow of goods (Rushton and Walker, 2007). In other words, 4PLs design, build and run comprehensive supply chain solutions for clients. While 3PLs and 4PLs both work horizontally with several supply chains, 4PLs typically have no physical assets of their own apart from information and communication technology (ICT) systems. This setup contrasts with that of a 3PL, which generally seeks to fill its asset capacity, possibly with distribution centers, warehouses, terminals, trucks and other means of transportation.

TLog, established in November 2007, is an independent 4PL in the fast-moving consumer goods (particularly beverage) industry, and currently offers two main types of services. The first type of service is physical logistics services, including inbound transport, warehousing and door-to-door B2B distribution. The second is supply chain services, which covers demand and inventory management, purchase orders, customer service and supply chain consulting, and invoicing with direct cash flow to clients. As the company grows and its capacity expands, TLog aims to add more additional value-added supply chain services, such as key account management and accounting.

As an administrative LSP, TLog uses the ICT system to integrate and coordinate outsourced services with 3PLs, clients (such as importers), clients' clients (retailers), and to arrange bank payments. Therefore, the 4PL is responsible for arranging the flow of both money and information. 3PLs are responsible for handling the physical flow and executing the physical transport tasks. Regarding inbound logistics, the 3PL contacts producers and arranges pickup services, and then delivers the product to destination warehouses. In terms of outbound logistics, the 3PL delivers the products from the warehouse to the retail stores on notice from the 4PL, which receives orders from retail stores through an integrated information system. Geographically, TLog serves Norway, Sweden and Finland. Our focus here is on TLog's work in the Norwegian market.

Insert Figure 1 here

Analysis

The analysis starts by illustrating three forms of value creation that correspond with the original HP model: i) exploitation of similarities in distributive relationships; ii) achieving efficiency through functional integration; and iii) joint solutions through systemic collaboration. The analysis then highlights the implications of network externalities and illustrates how VLIs influence TLog's collaborative scope.

Distributive Collaboration to Lower Logistics Costs

TLog creates value by consolidating the volumes of all of its clients, thereby achieving economies of scale and scope. Individual clients can achieve better terms by joining TLog's network. Our interviews showed that logistics costs are a major reason why clients decide to outsource to TLog. Additionally, TLog chooses clients with similar needs, both with respect to product type (including stock keeping units [SKUs]) and sales channels. As one of TLog's partners put it, "...it is unwise to widen the segments too much at an early stage when building synergies because it is necessary to classify the different clients in order to specify common needs and requirements". Basically, TLog explores the similarities among network members to reduce costs. Similarly, TLog set up service portfolios and implemented an important rule: a majority of clients must accept the services offered. If only one or a few clients in the network want a specific service, TLog will consider adding it as long as it believes other clients will be attracted to it over time.

The clients in the examples above are all indirectly interdependent on one another through their connection to TLog. Thompson (1967) referred to such interdependence as pooled interdependence. Distributive collaboration is achieved by TLog organizing and arranging the clients together. The distributive form of collaboration is fundamental to LSPs in general, and TLog's work is further addressed with respect to externalities, after presenting the functional and systemic forms of collaboration.

Functional Collaboration to Achieve Efficiency

Functional collaboration is based on the long-linked technology and sequential dependence that Thompson (1967) stressed, in accordance with the value chain model and the entire supply chain debate. Functional collaboration can be identified at the operational level of interaction between TLog and other relevant actors; e.g., TLog's "purchase-to-pay", and "order-to-cash" processes.

The *purchase-to-pay process* consists of several sequential activities, as shown in Figure 2. These activities are coordinated among five major players: the supplier, the inbound transporter, TLog, the local warehouse and the local brand owner. The goal is to coordinate inbound transportation from producers from all over the world to warehouses of local markets, making products ready for sale.

Insert Figure 2 here

The *order-to-cash process* aims to coordinate the outbound transportation of products from local warehouses to retailers. Figure 3 illustrates the detailed process and the actors involved.

Insert Figure 3 here

Economies of integration are achieved through TLog's efforts to coordinate all relevant actors to co-perform the tasks in a structured sequence; that is, one step cannot start until after the completion of the previous step. Both examples highlight the importance of efficiency; in particular, just-in-time (JIT) delivery is required for the order-to-cash process. The retailers specify fixed delivery windows; failure to deliver within the specific window is not accepted.

To ensure collaborative efficiency, TLog uses key performance indicators (KPIs) to measure key activities. The KPIs include on-time delivery, delivery error, picking quality, and inventory level. TLog uses a basic set of standard KPIs in most contracts. The KPIs that TLog agrees upon with clients are exactly the same as those used for the 3PLs. TLog holds KPI meetings at least monthly (sometimes every two weeks) with the relevant parties, which are primarily 3PLs. When a party fails to deliver on its expected performance, the other party has the right to take steps, as agreed in the contract. However, the two parties seldom terminate the contract or charge each

other penalties. TLog believes that trust is very important in this context and expects the other party to take action regarding the KPIs. In other words, the parties are expected to be familiar with the measurements and to know how to deal with problems when not meeting the service standard.

Insert Table 2 here

Systemic Collaboration to Provide Solutions

Systemic collaboration is illustrated using two examples: 1) the pre-contract process; and 2) the ICT development process.

The first example of systemic collaboration is the client specification process in the pre-contract stage, during which both parties are committed to determining optimal logistical solutions. The time from the initial meeting until the final contract is signed can range from three months to two years, depending on the services covered and the type of client. TLog divided the pre-contract stage into four steps. The first step is to build trust, given that cooperation involves sharing quite detailed and potentially confidential information. Some firms might postpone the outsourcing process due to a lack of resources and time. However, once clients decide to cooperate, they work with TLog to specify the service portfolio. When this step is taken, it usually means that the involved parties are setting up expert teams to analyze and evaluate the clients' entire supply chain and to determine the logistics solutions requirements. Based on that analysis, TLog presents its solutions and terms to the client, and, if the client is satisfied, the two parties sign the contract.

In the pre-contract stage, the goal of the interaction is to get the client interested in cooperating and to determine effective logistics solutions. The involvement of experts from both sides is crucial for the process, because it creates a common understanding about client needs.

The second example is the ICT development process. “ICT development” primarily refers to the addition of new functions to existing systems. At TLog, one specialized board—the change

control board—organizes and manages the overall system development. The board consists of the business managers in each of the three countries, and the process managers may attend if additional details are needed. All requests concerning system changes are sent to the board for prioritization, and the ICT manager is then responsible for implementing those requests. A request can come from both external clients and the internal organization. The board usually prioritizes changes that several customers require and any special procedures or routines that increase the system's efficiency. The change control board meets monthly and launches different batches of projects four or five times a year. The ICT manager works together with the development teams, including personnel from both TLog and two external partner companies who are specialists in ERP system development, implementation and customization. The ICT development processes involve mutual adjustments with the working parties, which means the ultimate solutions depend on mutual effort and commitment from two or several parties.

Network Externalities and Value Logic Interactions

The HP model and the notion of VLIs suggest that value creation differs as a function of variations in interdependence and technology. Distributive collaboration creates value in TLog's network by joining actors together into a system, and involves indirect linkages between senders and receivers wherein TLog performs its mediation. Network externalities are present in such indirect linkages. While it is true that the facilitation and accumulation of volumes from several clients does have some obvious cost benefits, since better terms for transportation and warehousing can be obtained, such cost synergies should not hide the value dimension of distributive collaboration. TLog must acknowledge that the identities of its clients represent a source of value in the network. This awareness was accentuated when TLog utilized externality effects by facilitating *direct* linkages to create value through workshops and seminars, where the parties meet in order to share and discuss logistical matters. The value creation potential of such initiatives depends on TLog's ability

to facilitate such direct interactions, and on the number and character of the participants (e.g., their willingness to share experiences regarding logistical problems and their solutions). Similarly, product tasting events provide important opportunities for TLog's clients to market their products to retailers. TLog creates direct linkages by organizing product tastings on behalf of its clients. The right composition of clients (and their products) thereby brings value to the entire event and shapes the value creation that the retailer will experience. Even clients representing high-volume standard products that are less attractive for retailers will benefit from networking opportunities with smaller clients representing niche products.

Notably, it is not only the distributive form of collaboration that is subject to externalities, but also the functional and systemic forms. By focusing on joint planning procedures for several clients with similar supply chain needs (functional collaboration), including the coordination of several clients' supply chains regarding inbound and outbound logistics processes, TLog improved the efficiency of each client's supply chain. Inviting one more client with similar planning needs creates value for the entire set of clients (an efficiency-oriented externality).

Moreover, externalities also influence economies of innovation and change (solution-oriented externalities). The study showed how TLog and a client engaged in a process in which both parties are committed to identifying "optimal logistics solutions". TLog's cooperative scope regarding "optimal logistics solutions" is not straightforward, however; what is optimal in one relationship is subject to the distributive logic that may demand the adaptation of client-specific requests to the characteristics of other clients and their functional demands for efficiency. Innovations in supply/distribution networks are often tied to other customers and their functional integration. Consequently, consultancy services provided by TLog (based on an intensive technology) are subject to pressures from the clients to provide unique solutions to their supply chain concerns (which are essentially long-linked), and TLog's internal pressures (or, in other words, the combined pressures from its other clients) to design these solutions to maximize the

value extracted from the pooled interdependencies that exist in the entire network. Naturally, TLog's cooperative scope, including the way in which its consultancy services are adapted to client requests in line with network standards, depends on whether TLog also intends to actually perform the logistics services (i.e., to perform the mediating service in addition to solving a logistical problem).

Theoretical Implications

Based on the developed HP model, Table 3 summarizes three collaborative forms of value creation, a general awareness of externalities, VLIs in relation to LSPs' cooperative scope, and how these correspond to different LSP types.

Insert Table 3 here

VLIs illustrate the potential tensions between the individual nature of single value chains (clients), their supply chains (interlinked value chains), and the shared nature of LSP networks. We propose that LSP clients generally seek to optimize with respect to their individual needs, while the network operator (the LSP) seeks to optimize with respect to the aggregate of chains; i.e., the size and composition of its client base. As such, what is optimal for the network may not always be optimal for the individual chain. In other words, a LSP that focuses "too much" on pleasing an individual client may save the relationships but ruin the network. A LSP's cooperative scope will certainly differ from case to case, but its scope is generally "in its network" (Hertz and Alfredsson, 2003); the network provides opportunities but also restrains the LSP. A LSP providing unique solutions need to take the "systemic" label seriously; it must often be systemic in order to utilize externalities to develop *the network* (and not individual clients' desire for functional collaboration).

Collaborative Value Creation and Different Types of Logistics Service Providers

Thompson (1967) argued that the different interdependencies are based on a Guttman scale, indicating that serial and pooled interdependencies are present when reciprocal interdependencies are present, and pooled interdependencies are present when serial interdependencies are present. Following this logic, we suggest that different types of collaborations and the associated VLIs correspond with different LSP types. As Table 3 indicates, the degree of "within vs. between" supply chain collaboration that a LSP intends to facilitate will define its cooperative scope.

Traditional carriers (cf. Cui and Hertz, 2011) connect senders and receivers by moving goods from A to B. They engage in distributive collaboration with clients who usually are in charge of integration within their own supply chains, explaining the common characterization of such providers as "non-value-adding" or "simple". However, the value-creating dimension of such businesses deserves attention due to network externalities. The cooperative scope of logistics operators is rarely related to single clients' supply chains, but to the total number of clients they intend to serve; in this respect, there is nothing 'simple' about creating indirect and direct linkages among a set of clients.

As LSPs offer more integrated functions to their clients, such as inbound and outbound logistics and warehousing, they become 3PL actors. They manage serial interdependencies and integrate further in their clients' supply chains. Some of these 3PLs manage integrated chains for single clients (cf. Bumstead and Cannons, 2002), which means the focus is then on making individual firms pull in the same direction in order for the chain to stay tight (cf. Narayanan and Raman, 2004). However, the cooperative scope of most 3PLs is more challenging because they also think about making several supply chains pull in the same direction, in addition to several firms within a chain (Huemer, 2012). This illustrates the importance for TLog to create a system where both clients and 3PL partners can work with the same KPIs. It highlights the VLIs such

providers face; i.e., the interaction between mediation and the long-linked technology and the added value of bringing in one more client with similar logistics needs for its supply chain.

When distributive or functional collaboration is improved by intensive technologies to foster innovations and improvements, the LSP becomes a 4PL; an active integrator in its own right. 4PLs are not being "passively" integrated by "active" clients; instead, they develop both standards and service offerings by coordinating reciprocal interdependencies related to innovation and network change. The intensive technology interacts with the long-linked technology, primarily regarding the joint problem solving of service developments (functional integration in the clients' supply chains). The intensive technology interacts with the mediating technology, essentially due to developments in existing infrastructures (i.e., standardizations in the form of logistical resources). Therefore, we propose that including one more client with similar service development needs and/or similar network infrastructure development needs will add value to the network the LSP mediates.

Another peculiarity of 4PL actors is that they are usually non-asset-based; i.e., they relate to 3PLs to access physical logistics resources. Therefore, a basic difference between a 3PL and a 4PL concerns infrastructure developments. This suggests that the cooperative scope for its value creation differs from a regular 3PL provider. Although it remains an empirical matter of inquiry, it seems plausible to suggest that a 4PL is less tied to given standardizations to coordinate pooled interdependencies since it can relate to different 3PLs to assume different physical setups towards different clients. Such flexibility may improve the 4PL's provisioning of both functional and systemic forms of collaboration.

Implications for Strategy Research

This paper has highlighted collaborative value creation initiatives from a LSP perspective and, in contrast to the few firm-level studies on the value creation of LSPs, has also acknowledged a

system level of analysis. The study presents LSP strategy and value creation as a cooperative endeavor, which is in keeping with the growing interest in cooperative strategies as expressed, for instance, by the Strategic Management Society, a recently created interest group in this area. The study also relates to the strategic management discipline's development towards meso-level theories. Whereas production and manufacturing logic dominate traditional frameworks such as Porter's (1985), it has been claimed that service-based firms or so-called knowledge-intensive firms follow other paths of value creation (e.g., Maister, 1993; Løwendahl, 1997; von Nordenflycht, 2010). More recently, mediation-based firms have attracted increased attention, including those in fields such as banking (Sasson, 2008), insurance (Fjeldstad and Ketels, 2006), telecommunications (Andersen and Fjeldstad, 2003), and logistics (Huemer 2006; 2012). From a collaborative perspective and considering VLIs, the strategic work of LSPs offers an interesting setting. It is not a pure mediation setting (such as electronic banking); instead, it portrays how mediation-based actors try, via systemic and distributive efforts, to improve their clients' functional concerns. Whereas the fundamental logic of the LSP is mediation in terms of performing a distributive service, it is also subject to externalities in its functional and systemic value creation initiatives. Supply chain and distribution networks are composed of functional concerns; indeed, such long-linked and sequentially interdependent relationships are core to the entire supply chain management discipline, as well as Porter's (1985) notion of value systems.

Managerial Implications

As LSP services become more advanced, they "climb" the ladder of technology development by increasing their ability to efficiently coordinate sequential activities among different supply chains and to foster and drive joint problem-solving processes (see Table 3). In other words, they leverage their mediation efforts to manage different forms of collaborative value creation initiatives.

Managers are advised to acknowledge that the strategic relevance of networks differs for different types of LSPs, as does their cooperative scope. Traditional logistics operators primarily facilitate clients' transportation or warehousing needs. 3PLs must also efficiently facilitate and support clients' supply chains; for 3PLs, collaborative value creation is closely connected to the functioning of their clients' supply chains. To facilitate an efficient flow in their supply chains, it is important to understand the clients' value creation logic based on the value chain's sequential logic. The 3PL's cooperative scope depends on the degree of service uniqueness in each supply chain and on acknowledging the externalities that influence its entire network of different chains. Arguably, the challenge of building trust between different chains increases from traditional operators and carriers to 3PLs, as the latter's clients have outsourced more compound services which partly determine their own competitiveness. However, also traditional carriers should acknowledge externalities and correspondingly the size and composition of their client base.

4PLs must facilitate clients' transport needs and supply chain flows as well as 3PLs' logistics operations and other network participants' activities. They must also foster innovative network solutions that benefit all parties involved. Therefore, to understand how LSPs create value, the networks in which they are embedded must be understood. Strategic tasks for 4PLs are the most complicated because both client characteristics and their supply chains, including other LSPs to which 4PLs outsource logistics services, are important.

Consequently, LSP managers are increasingly required to understand their cooperative scope and how they support and facilitate other actors (clients or possible clients and partners) in their value creation processes. This study offers the developed HP framework as conceptual tool for such endeavors.

Conclusion

Whereas mainstream strategy research tends to ignore the LSP, contemporary supply chain and logistics literatures portray them as non-value-adding support actors. This study presents a radically different view; not only do LSPs appear to create value in different ways, they also need a rather advanced and well developed understanding of different types of economies and forms of collaboration.

This study developed the HP model and its focus on system level value creation by including network externalities. Moreover, we developed the HP model with the VLI concept to address the scope of collaborative value creation initiatives. In this way, the study addressed how LSPs should take advantage of being connected and explore the presence of various forms of interdependence.

Considering advanced LSPs roles as network builders and facilitators, it seems plausible to suggest that they need a high awareness of the scope for collaborative value creation initiatives and the VLIs following such initiatives. LSPs are increasingly becoming active integrators within and between supply chains.

Perceiving LSPs as strategic entities creates a number of future research avenues. We know more about how active clients choose LSPs than how LSPs choose clients and how such selection processes influence the overall attractiveness of their networks. Similarly, knowledge about how LSPs become integrated is better developed than knowledge about integration from a LSP perspective. How LSPs leverage their networks is a worthwhile topic. Finally, future studies should acknowledge the limitations of the present study by using a multi-actor perspective on collaboration and by considering the scope of cooperation in different types of supply chains/distribution networks. This would improve our understanding of how different actors influence the strategic development in networks. Studying different kinds of LSPs may also provide a nuanced understanding of the collaborative nature of value creation in networks.

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List of figures and tables

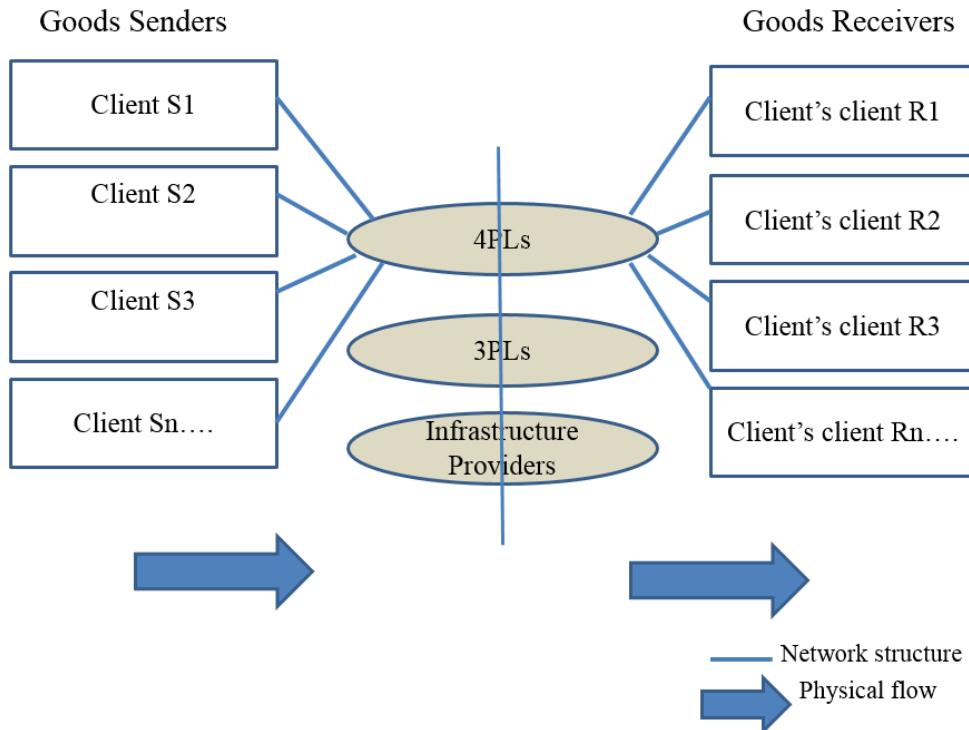


Figure 1 the logistics network of 4PLs

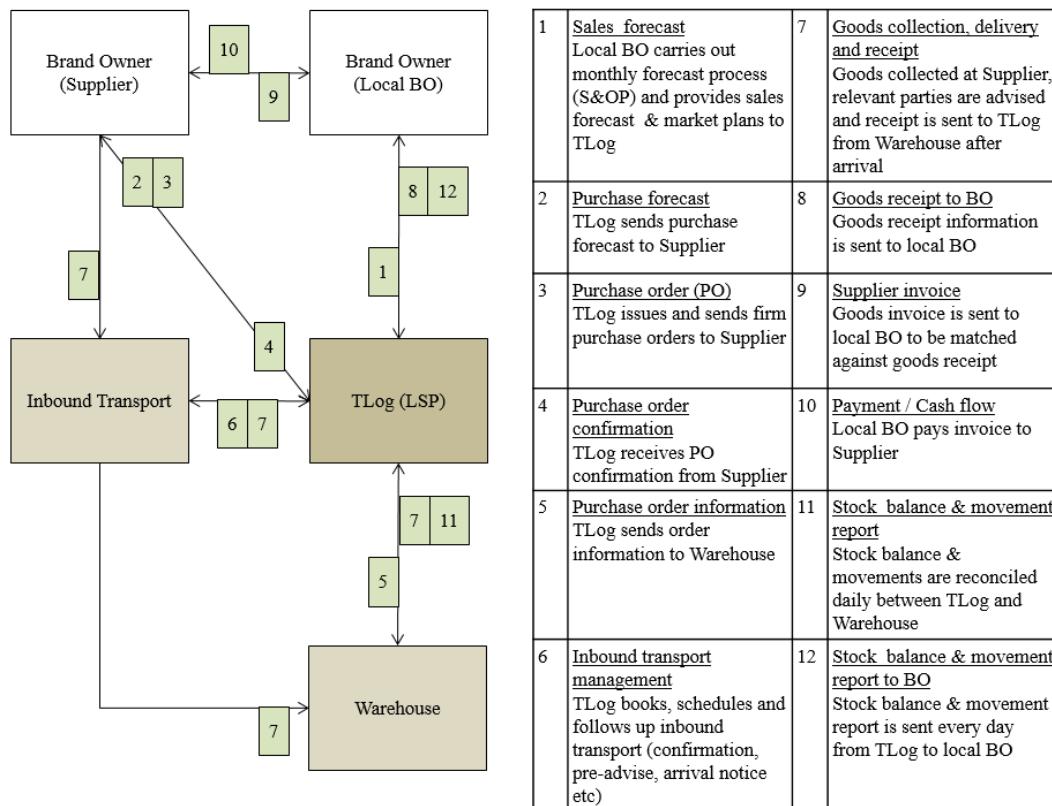


Figure 2 the Purchase-to-pay process

1	Customer Order End Customer sends order (via EDI) to TLog	5	Goods delivery Physical delivery note (paper) is issued by Warehouse and will follow the goods to the End Customer. Delivery confirmation is sent from Warehouse to TLog. Goods are delivered to End Customer.
2	Order confirmation Order confirmation is sent (via EDI) from TLog to End Customer	6	Invoicing to Customer TLog performs the invoicing to End Customers (EDI if required)
3	Picking order Picking order is sent via EDI from TLog to Warehouse	7	Invoicing information to local BO Copy of invoice is sent via EDI to Factoring Bank. Invoice information is sent daily from TLog to local BO who will update ERP system accordingly.
4	Picking confirmation (DESADV) Picking confirmation is sent via EDI from Warehouse to TLog and to End Customer if required	8	Payment / Cash flow Direct payment from End Customer to Factoring Bank. Factoring Bank submits payment to local BO.

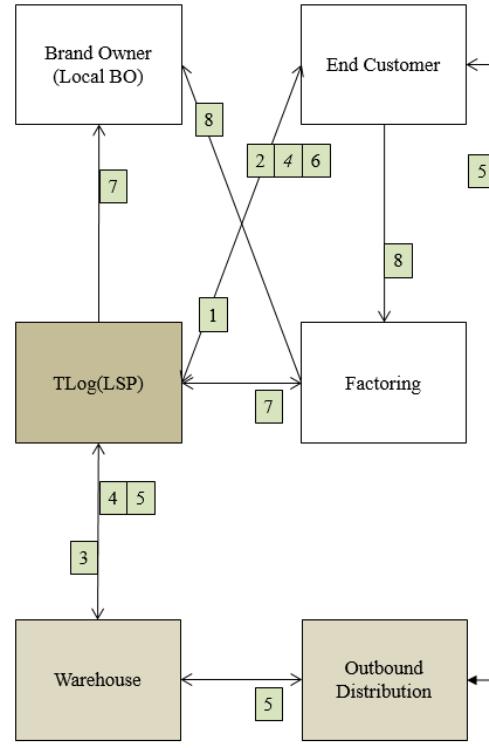


Figure 3 the order-to-cash process

Table 1 The conceptual framework

Type of Economy	Collaboration Category	Type of Relationship and Main Concern	Type of interdependence	Coordination mechanism
Scale and scope	Distributive	Mediating	Pooled	Standardization
The original HP model	Integration	Functional	Linked	Serial
			Reaping benefits from similarities through connections to others	Planning
	Innovation and change	Systemic	Coordinating serial interdependences through joint planning	Mutual adjustments
			Problem solving	Reciprocal
			Systematic adaptations of resources and activities	
			Mutual learning and teaching	
Development of the HP model	Network Externalities (value focused)	Distributive (facilitating inter-client connections)	Mediating Building and composing a network of relationships	Pooled
	Value logic interactions	Highlights the interplay between collaborative categories	Explores how a set of interdependencies influence value creation	Standardization
			Highlights the presence of network externalities also in functional and systemic forms of collaboration	Focuses on how mutual adjustments and planning coexists with standards

Table 2 Definition and measurement of KPIs

KPI	Definition	Measurement and Source	KPI Target
On-time delivery	Percentage of orders delivered to the customer according to the agreed schedule divided by the total number of dispatched orders	Total number of orders delivered to the customer according to the agreed schedule divided by the total number of orders despatched x 100	93.0%
Delivery error	Number of orders delivered without damage, lost, or not delivered at all as a percentage of total dispatched orders	Number of orders delivered without damage, lost, or not delivered at all divided by the total number of orders dispatched x 100	98.5%
Warehouse picking quality	Number of order lines correctly picked as a percentage of the total order lines ordered	Number of order lines correctly picked by the warehouse divided by the number of order lines ordered by the customer (excluding order lines not in stock) x 100	99.5%
Inventory gain/(losses) in units (net adjustments)	Net inventory variances [in units] during the month divided by receipts and dispatches during the month [in units]	Net number of adjustments made to inventory (in units) divided by the total sum of received and dispatched units x 100	0.03%
OTIF submission of any tax reports and Intrastat reporting	Percentage of returns filed by TLog on behalf of NN, completed accurately and to the agreed timescale.	Number of tax and other governmental returns and submissions made by TLog on clients' behalf divided by the number with any error or submitted after the original deadline x 100 (to exclude any errors originating from details provided by clients).	100 %

Source: (TLog, Unpublished results)

Table 3 Collaborative value creation in LSP networks

Type of collaboration	Distributive	Functional	Systemic
Interdependence	Pooled	Sequential	Reciprocal
Traditional Economy	Cost focus through scale	Economy of integration	Economy of innovation
Externalities	Value focus through externalities	Efficiency externalities	Solution externalities
VLI	Mediation as basic source of value creation	Mediation interacts with the long-linked technology, joint planning	Mediation interacts with the long-linked and intensive technologies, joint problem solving
LSP Scope	Increasing the scope of collaboration between different clients (the facilitation of indirect and direct linkages between different clients)	Increasing the scope of collaboration within supply chains (the coordination and adjustment of activities and functions over several company borders in a supply chain) Increasing the scope of collaboration among supply chains if efficiency externalities is to be explored	Increasing the scope of system solutions (extensive interactions regarding infrastructure development or service innovation within and between supply chains)
LSP Types	Logistics operators		
	3PLs		
	4PLs		

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