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Collaboration and Competition between 4PL and 3PL: A study of a fast-food supply chain

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ABSTRACT: This paper analyzes, in the form of a case study, the coordination of ten 3PL (Third-Party Logistics) by a logistics leader (4PL - Fourth-Party Logistics). The study contributes to the understanding of the factors that differentiate 3PL as collaborators and as potential competitors, revealing that the services they render complement each other within the same operation.

KEYWORDS: Supply Chain Management; Collaboration; Third-Party Logistics; Fourth-Party Logistics

INTRODUCTION

Over the last few decades, the consolidation and practice of Supply Chain Management (SCM) concepts has led the logistics service provider business (3PL – Third-Party Logistics) to play a more comprehensive and integrated role with its clients. Following this trend, new configurations of this role have appeared, such as logistics integrators (4PL – Fourth-Party Logistics), which combine the management and operation of supply chain logistics (Sahay, 2003).

In this context and based on a case study, this article focuses on the theme, examining the management by a 4PL of ten other logistics service providers (3PL) for a large multinational fast-food chain operating in Brazil. Although this study deals with a specific case involving 11 companies, it reveals several characteristics of this new type of logistics service operation.

Therefore, based on the case analysis and on the 4PL theory, the authors aim to compare a practical case with descriptions of 4PL within the logistics litera-

ture. Additionally, the paper highlights the factors that differentiate 4PL and 3PL as competitors or co-operators.

The study does not intend to define a position about the 4PL but to contribute to a better understanding of the subject. Because it is a relatively new theme within the literature, we believe this is an opportune moment to explore it in greater depth, particularly since there are still a variety of definitions of concepts and ideas, or even of propositions of what a 4PL actually does.

Based on a survey about Logistics Providers by Langley and Allen (2005), the next three to five years will see a growing trend for the adoption of 4PL solutions (or logistic integrators). The reason for this is that companies are increasingly adopting the concepts of greater integration within their supply chain processes, thus requiring 4PL service providers. These providers should therefore offer multiple services of logistics information, operational knowledge and relationships, as well as participate directly in the integration of supply chain processes.

RESEARCH METHOD

In its initial phase, this work was founded on bibliographic research as a methodological approach, focusing specifically on issues relating to the theme of 3PL and 4PL and how they act within the ambit of the supply chain (SC). Therefore, in this initial phase, the research aimed to identify in the literature information concerning these agents and their role in the SC (Lakatos and Marconi, 1991; Gil, 1994). In this phase, the authors also analyzed the theme based on different sources of information, such as theses, specialized national and international journals and periodicals, articles from symposia and books relating to the area, always prioritizing academically relevant and up-to-date sources.

In the second phase, the methodological approach adopted was the case study. In this kind of methodology the study is empirical, generally investigates a contemporary subject within its real context, and the frontiers between the subject and the real context are still not clearly defined (Yin, 2001). Furthermore, the article fulfills a key characteristic of case studies, that is, its focused to clarify the reasons for a decision process conducted, how it was implemented and what the results reached (Yin, 2001).

The main object investigated in this case study is a large multinational fast-food supply chain operating in Brazil which adopts the 4PL management standard in its operations. During the study, the logistics service provider of the fast-food chain (4PL) and ten other companies (3PL) were analyzed by the authors for about two years. This period enabled the authors to understand not only each company's business, but also its behavior. During the research, interaction with several employees clarified doubts and aligned the theoretical research to the practical observations. In addition to helping the authors gain an understanding of the companies, this interplay facilitated a comparison of the factors outlined by the theory and those observed in practice. However, this proximity between the authors and the companies did not permit to characterize the procedure as action research, since its research method protocol was not strictly followed (Coughlan and Coghlan, 2002).

In addition, the experience of maintaining close contact with the companies for a lengthy period enabled the authors to garner a large amount of information and numerous considerations concerning the process. It is also important to mention that studies on the 4PL provider, particularly with respect to its in-

tegration with the management of the supply chain, as well as practical cases involving this subject, are still quite rare within the literature.

LITERATURE REVIEW

This study explored basic literature available on: (1) 3PL, (2) 4PL, and (3) cooperative management and the role of the logistics provider.

3PL Providers

Characterized by a variety of organizational transformations, outsourcing is a consolidated practice in several sectors, including logistics services. Initially, logistics management focused on storage and transport, without involving a strong relation with more strategic processes of SCM.

According to Lonsdale and Cox (2000), outsourcing has occurred more frequently in support activities than in the primary chain activities. In the case of LSP (logistics service providers), whether or not they take over primary activities, they are involved directly in the client's business. Surveys show that companies feel more comfortable about outsourcing less important activities rather than more vital ones.

Despite the logic of those studies, it can be stated that outsourcing with a LSP is an exception, considering that many logistic activities are very important for companies' businesses. About 75% of the outsourced activities are support services, since managers believe it is more advantageous to assume risks involving activities not fundamental to the company's business (Lonsdale and Cox, 2000).

In a complementary vision, Svensson (2003) believes that companies have been reducing the number of sub-contractors and concentrating an increasing number of activities at one sub-contractor. This augments their dependence on the supply chain, as well as the chances that the LSP will engage in greater number of activities for one company or supply chain. This opinion is shared by McIvor (2003), who believes outsourcing should take into consideration the logistics provider's competence to integrate the activities and sub-activities contracted.

According to Berglund *et al.* (1999) two factors lead companies to outsource: the size of the demand and the size of the supply chain. In an adaptation of the topics suggested by Bolumole (2001) and Jaafar and

Rafiq (2005), below is shown a summary of the motivations and reasons for a company to outsource logistics services and the possible reasons why they opt for a partner:

- Concentrating efforts on their own business and gaining new markets;
- Reducing logistics costs and avoiding investments in assets unrelated to the company's business;
- The presence of a complex supply chain due to a fragmented suppliers base;
- Increasing product restitution (reverse logistics);
- Coordinating logistics activities in a wider context;
- Improving and controlling the quality of logistics services and activities;
- Greater flexibility and efficiency in logistics operations;
- Access to new Information and Communication Technology (ICT) and logistics knowledge.

Authors such as Christopher and Towill (2001), and Knemeyer and Murphy (2005) point out that price is one of the most important criteria in the selection of a LSP, second only to its experience, the activity to be outsourced and the qualifications of its staff. This opinion contradicts the reasons presented and discussed that this provider, through its activities, is essential in the development of the supply chain. If the price of the service or activity is a determining factor, then there may be limitations and deficiencies in the chain, since it ignores the importance of integrated services and activities in the final results of selling the product to the consumer. It is clear that this position cannot disregard the fact that, from the standpoint of the hiring company, not investing in logistics is a way to reduce cost. For Ayers (2001), the LSP is an instrument of partnership in the supply chain due to its know-how and infrastructure. Langley and Allen (2005) consider the LSP an external organization that carries out all or part of the logistics activities and functions for a company, but Stefansson (2005) proposes the name "logistics services intermediary", assigning it other complementary services.

The initial tendency of outsourcing logistics processes, contributing to the emergence of the LSP, originated from a lack of specialization in distribution processes, centered particularly on the basic logistics functions of storage and transportation activities. Later, companies that used outsourcing to obtain

advantages and facilitate supply chain integration realized that the latter could be seen as part of the chain. Organizations that outsourced for operational and cost-related reasons restricted the LSP's involvement to the basic functions of logistics (Bolumole, 2001; Christopher and Towill, 2001).

Stefansson (2005) identified from the literature an apparent mixture of terminology to describe the different services rendered by LSPs. However, most of the terms include the same activities or present slight modifications in the portfolio of services offered.

In a study that discusses and defines the theoretical structure of the LSP based on commercial relationship between users and LSP, Knemeyer and Murphy (2005) point out the lack of more comprehensive definitions for LSP services, and the fact that studies tend to adopt a particular view of them. As Ashenbaum *et al.* (2005) pointed out, the terms used are different, but the function or activity is the same, indicating that these differences are simply a matter of nomenclature.

The degree of outsourcing varies, and outsourced activities are highly complex. The LSP ranges from the simplest activity to the most sophisticated logistics solutions (Stefansson, 2005).

The Logistics Service Market

Logistics is a key element used by companies to develop systems within their supply chains and which companies that use LSP providers consider a key element in the development of their supply chains (Rafele, 2004).

Svenson (2003) points out that companies tend to sub-contract more activities in the outbound flow and fewer in the inbound flow, maintaining a greater dependence on outbound processes than on inbound ones.

Regardless of the relation in the logistics flow, LSPs have gained space and rendered the client more dependent, for researches have shown the reduction in logistics assets as one of the main causes of outsourcing these services. Hence, it is naturally more difficult for a company that does not invest in such assets to assume logistics operations instead of outsourcing them.

Sinkovics and Roath (2004) pointed out that the relationship between the LSP and a manufacturer leads to operational flexibility that increases the competi-

tive orientation through the impact of logistics on later market performance. Thus, operational flexibility is the most noteworthy factor. If a company satisfies its clients' needs and expectations better than its competitors do, a better relationship is built, increasing the possibility of retaining the client. Thus, manufacturers can leverage and improve their capacities by working with LSP providers. According to these authors, the fact that the manufacturer does not need to develop logistics capabilities helps it internally and also improves its relationship with the market.

Chapman *et al.* (2003) see the logistics industry as a classical example of birth and development of a new vital service, transformed from a transport service concept aimed at serving all the logistics requirements of a client. This view indicates the LSP's flexibility in the market with regard to the potential services it offers. Usually, the LSP accumulates roles as it extends its relationship with its clients, reaching a higher level of understanding and trust in the operational process and in the services provided. Thus, it gains confidence and enlarges its area of action, building up a wider portfolio of activities. Halldórsson and Skjott-Larsen (2004) assert that the LSP should be able to generate competencies for its clients, creating a partnership of logistics solutions, and should also be able to learn from its clients. Therefore, each new client or change of clients generates a learning curve, creating new abilities and competencies for the LSP.

In this context, LSPs have expanded their services since 1994, seeking to fulfill their clients' expectations of dedicated services. More recently, businesses have focused on services at the end of the supply chain, such as equipment installation, repair services, kit assembling, etc. This market trend has led LSPs to focus on a specific segment of companies or businesses, which has been considered a differential factor for the competitiveness of LSPs (Lieb, 2005).

4PL Providers

The LSP usually intends to maintain its services and continue working as a logistics solutions provider. However, the tendency in the contracts between LSPs and their clients is for greater geographic coverage and more activities, which is a challenge for LSPs. In the long run, the market tends to provide more opportunities for logistics companies dedicated to broader projects aimed at the coordination and integration of activities, such as 4PLs (Lieb, 2005).

Langley and Allen (2005) asserted that, by incorporating new activities required by the market, the LSP has changed in recent years, a movement that demonstrates the progress and maturity of these operators. However, clients expect to achieve greater skills in service development, relationship improvements, relevance in information and involvement of integration rules and concepts in the supply chain through the LSP, and to build expertise and dedicated operations. Likewise, for these authors, the market turns to solutions proposed by companies focusing on logistics coordination. The following are expectations for the LSP:

- Evolve into a solution provider for the supply chain;
- Increase the portfolio of outsourced services through a larger number of activities (expand services for its clients)
- Continuous improvement in technology and ability to provide the necessary services;
- Focus on the client's needs (provide the right solutions, become involved in the client's plans for integration and understand the industry-client)
- Expand its relationship with the client;
- Continue to acquire companies and expand businesses;
- Act in global markets;
- Move toward logistics coordination solutions as a 4PL;
- Search for long term relationships, based on contracts with duration exceeding two years.

Chapman *et al.* (2003) reported that logistic organizations are redesigning their structures and relationships, creating a knowledge chain that facilitates and improves data, information and knowledge communication, as well as coordination, decision-making and planning. They should mainly synchronize activities between agents of the supply chain (aiming to gain and integrate knowledge) and operate with information and communication technology, thus providing greater efficiency and productivity for the chain. Ratten (2004) highlighted that many logistics alliances have been made based on technological changes, and improved data transmission and transactions. In this case, alliances with companies of the technology sector may be necessary for the LSP.

Bienstock (2002) pointed out that the LSP should think strategically in terms of rules and external

information resources, to maintain its position and support the relationships with its clients. Considering that the LSP is a natural candidate to evolve their services into a 4PL, Visser *et al.* (2004) and Hoek (2006) argue that they must have well defined strategies to begin the transition process. Furthermore, they must understand the importance of investments in information and communication technology to achieve this objective. In their opinion, the lack of these skills may explain the slow development of the 4PL.

Visser *et al.* (2004), Hoek (2006) and the Supply Chain Executive Board (2005) make the following observations about the role of 4PL in this type of management.

Visser *et al.* (2004):

- The LSP leads the operation, but its client controls the strategy for the basic concepts used in the supply chain. The LSP improves the effective operation of the chain, but does not get involved in the discussion of strategy and logistics concepts.
- The 4PL suggests how to reconfigure the supply chain in terms of space and functionality in order to cut costs and improve services. The 4PL develops intense knowledge and logistics competence,

and provides studies for its client to improve the chain. Thus, the 4PL suggests, designs and implements new solutions in the supply chain.

- The innovation is by the fact that the 4PL presents other priorities in relation to the traditional logistics company.
- A candidate for 4PL must invest in its image and reputation, specialize in certain activities and sectors, and find new ways to demonstrate its reliability.

Hoek (2006):

- The 4PL participates in the coordination of the chain, while the traditional LSP simply provides operational services.
- Becoming a 4PL lifts the traditional LSP to a position of product flow coordinator, instead of simply operating the physical transportation of the product.
- The LSP model requires more assets than the 4PL, since the latter is more dedicated to the coordination process.

Tables 1 and 2 summarize the considerations of Hoek (2006), comparing the development of services provided by LSPs and 4PLs.

Table 1 – LSP and 4PL Factors (Hoek, 2006)

Factors	3PL	4PL
Involvement in services provided in the supply chain	Physical movement and execution	Operation coordination and administration
Intensity of assets to provide services	High – vehicles, storage equipment	Low – information and communications system
Intensity of knowledge	Low – standard tasks	High – organization of product flow
Dependence on the manufacturer to supply the demand	Medium – low cost change and several service providers	High – the manufacturer has orders to fill and depends on its suppliers
Contact point at the manufacturer's	Negotiated contract	Dedicated contract and strategic coordination of the supply chain
Performance	Possibly limited in gains and results	More wide-ranging measures, involving client service and results in the supply chain
Shared information	Limited because it impacts only the execution	More wide-ranging, including clients and suppliers, policies and priorities

Table 2 – Advantages and risks in the transition from LSP to 4PL (Hoek, 2006)

Advantages	Risks
<ul style="list-style-type: none"> • Migration to added value service, and getting away from low profitability jobs • Expansion of relationship with the client, increased revenue and direct action in the client's supply chain • Keeping the client through high dependence on the information system and low reliance on own assets 	<ul style="list-style-type: none"> • Failure to serve the client by focusing on strategies that concern the LSP, which are not necessarily in line with the client's needs • Corroding and compromising the relationship while implementing the competencies • Few barriers to enter the market, with the possibility of saturating the market and transforming its services into commodities • Mixing different market and business models in a single organization.

Supply Chain Executive Board (2005):

- The 4PL offers logistics services for the supply chain, such as managing the LSP, providing ample opportunity for cost reductions. The 4PL consolidates the logistics needs of many companies, which gain from this scale and obtain advantages in negotiations with the LSP. In short, the 4PL acts as a total provider within the supply chain.
- With the LSP, the 4PL coordinates storage, shipment and deliveries. To this end, it must have online location tools and customer services able to make the transport operations visible. It must also manage claims and payments of contractors.
- With distribution services, the 4PL can use the LSP's assets or its own to deliver products to the client. Several other services can also be included, such as packaging and assembly.
- In consultancy services for the supply chain, the 4PL can analyze the information flow process to redesign a more efficient chain. This includes identification of the best alternatives of transportation, operation site, or delivery frequency. Its technological capacitation is also essential for the implementation and integration of services.
- The types of activities of the 4PL depend specifically on each company's needs, the most common being management of the LSP. Like the LSP, the 4PL is responsible for ensuring the most efficient and low cost storage, shipments and delivery. Some companies use the 4PL as a logistics leader to manage the LSP, transportation and storage site.

- Many companies are reluctant to outsource activities to the 4PL, believing they will lose control of the LSP performance and jeopardize the service to their clients.
- Control tools can help the relationship and improve the services contracted with the 4PL, such as:
- Agree on performance measures to evaluate operations, such as operational performance, customer service, management quality, and cost and control systems competencies;
- Implement objectives according to the level of contracted services;
- Share profits according to pre-established objectives;

A common denominator in the various considerations concerning the evolution of LSP is the coordination of the supply chain activities with its clients. The innovations of patterns presented lie in the coordination of other outsourced companies and the greater strategic involvement with the SCM. In short, the proposals confer new responsibilities on the LSP, as well as a new denomination.

Cooperative Management and the Role of LSP

According to Sahay (2003), the LSP should not be seen solely as the outsourcing of logistics services, but as a business relationship committed to the client's business.

The diversity of activities executed by the LSP, as well as its ability to act within the chain, taking on

new responsibilities for the client, is acknowledged by several actors. The greater the number of services the LSP incorporates into its portfolio the more specialized it becomes, thus gaining more clients and businesses (Lieb, 2005; Langley and Allen, 2005; Chapman *et al.*, 2003; Halldórsson and Skjott-Larsen, 2004).

The LSP expertise in performing its activities, even basic ones such as storage and transport, tends to contribute to the businesses of companies that lack such know-how. This idea is defended by Sinkovics and Roath (2004), and is complemented by the possibility of reaching new markets through the use of LSPs that already act in differentiated markets. The synchronism of several activities coordinated by one agent, such as the LSP, enhances the performance of the chain.

Chapman *et al.* (2003) report that clients want to have an LSP with the ability to develop logistics services so that it can carry out coordination and innovation actions. Pagell (2004) suggests several important points the LSP should observe in the integration of operational services in supply chains:

- Structure – Sufficient to serve the client's flow;
- Culture – Knowledge of how to deal with its own internal culture and with the different cultures of its clients;
- Communication – Be prepared for real-time communication;
- Measures and rewards – Ability to evaluate its internal and external operations, adding to results, rewards and penalties;
- Consensus/Integration – Maintain consensus and integration between the agents during operational practices;
- Operational size – Ascertain with the client if there is operational capability to perform the contracted services.

Thus, technological support for data transfer and transactions has become a powerful tool for the LSP. With up-to-date information and communication technology, new configurations are presented for logistics management by the LSP, as several authors suggest (Hoek, 2006; Langley and Allen, 2005; Visser *et al.*, 2004) when defining 4PLs as integrators or logistics leaders in a coordinating function that is broader than a simple operation.

Hoek (2006), Langley and Allen (2005) and Visser *et*

al. (2004) highlight the scope and responsibility of this provider in the supply chain, with the evolving trend of acting in the coordination of processes and the indirect management of third parties.

Stefansson (2005) presents the idea of a logistics intermediary as a way to improve costs and widen services, performing the role of coordinator and activities manager through its own structure and, when needed, using third party structures. In general, considering the different factors associated with the supply chain, such as its complexity, need for agility, and joint action with several agents and activities, the business opportunities for the LSP can be considered innumerable.

Authors such as Cox (200b), Hoek (2006) and Fawcett and Magnan (2002) mention the possibility of the LSP gaining more space in the supply chain as companies integrate their processes with their agents, as in demand management, which requires technology and coordination.

The adoption of the LSP with multiple activities can reduce the number of suppliers, leading to what was observed by Pires (2004) and Christopher (2006) concerning the right choice of partners in the supply chain. These authors argue that for the SCM it is better to have fewer committed suppliers than many scattered and uncommitted ones.

It is important to understand the importance of assets for the LSP, not only its physical operational structure such as facilities and equipment, but also technological components that facilitate its relationship with the client. In this aspect, technological tools allied to new management methods such as CPFR are instruments that should be part of the structure and knowledge base of the LSP.

These tools, according to Fliedner (2003) and Jhaukharia and Shankar (2004), favor the integration process and can be used by the LSP to improve the operational processes of the supply chain, involving several agents as well as gaining new activities and clients.

CASE STUDY AND RESULTS

The case study presented here was conducted based on three approaches and/or considerations: (1) considering the 4PL and the fast-food chain, (2) considering the 3PL studied, and (3) considering the analysis of factors that surround the relationships within these companies.

4PL and the Fast-Food Network

During its trajectory in the country, the fast-food chain has developed a relationship of commitment with its suppliers, sharing missions, objectives, beliefs and values. This position has clearly strengthened collaborative behavior. On the other hand, it has given most of its suppliers exclusivity with the restaurants, and its logistics services provider (LSP) has assumed the responsibility of acting as the SCM, coordinating not only delivery and distribution but also the inbound process with its suppliers. In this relationship, each agent's role in the supply chain can be summarized as follows:

- Fast-Food network: responsible for operating the restaurants, defining promotions and advertising, selecting suppliers, prices and products, developing new products, creating strategic business plans, assessing and standardizing processes, and solving conflicts in the chain.
- LSP: responsible for stocking and purchasing management, distribution and transport, supplying restaurants storage, transfer to other distribution centers within the country, financial management of the chain, logistics planning, field service and coordination of the supply operations in the chain.
- Suppliers: responsible for the quality of production, development of new products and the operation of inbound logistics.

Figure 1 illustrates the relationships between the parties in the above mentioned supply chain.

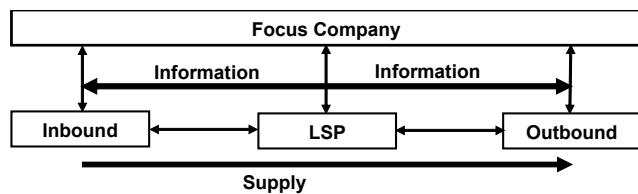


Figure 1: The Supply Chain of this study

It is important to note the this fast-food network structure in figure 1, which delegates to the logistics provider the responsibility of supplying restaurants, favors the use of the 4PL pattern in the management process.

The 3PLs

The ten companies from this study are logistics providers that have been in the Brazilian marketplace

for more than ten years, and have worked with the 4PL for over five years. All of them have expanded their activities over time, proving what the literature identifies as the natural evolution within the segment. The ten companies were chosen due the importance of their services to the 4PL, besides their daily activities in the routine of the fast-food network. The companies, whose names have been omitted here, can be described as follows:

Company 1 – Located in the state of São Paulo, it has about 35 employees, and has been operating in the logistics market for 11 years. Although its business focuses on air shipping, its services and operations have expanded in the last four years, taking advantage of its structure and relationship with its clients. To support its operations, it now has its own vehicles for transporting cold and dry products, a storage warehouse in the city of São Paulo, and contracted sub-operators in every state of the country.

Company 2 – Has several branches specialized in the storage of frozen and chilled products, retail distribution, and kit assembly. It has been operating for 25 years, has about 300 employees, uses its own vehicles for transporting frozen products, and its operation focuses on the fast-food segment.

Company 3 – This firm has been operating in the market for 34 years. It has 450 employees and 12 branches in the country, dealing with clients from different segments, such as Kraft-Foods, Sara-Lee, BSG-Continental, Parmalat, and others. It operates with transport, storage, assembly and packaging services, maintenance, and outsourced services.

Company 4 – This is a large cooperative in the transport segment which, in its 17 years of operation, has been specializing and incorporating its operations to large clients. It has 350 permanent employees and 40 storage branches in the states of São Paulo, Rio de Janeiro and Paraná, and operates a container terminal in Santa Catarina. Its main business is transportation, but it also has dedicated operations and storage for clients of distinct industrial segments such as Sadia, Perdigão, Danone, Brasken, Nestlé, Suzano Petrol, Firestone, etc.

Company 5 – Dedicated to customs operations, this firm services many large clients such as Arcor, Cabot and Flint-ink. It works not only with the management of import and export processes, but also offers storage and transport solutions for its clients' products. It has been in operation for 16 years, with administra-

tive headquarters in the city of São Paulo, and has 90 employees. It operates according to the 4PL pattern, focusing on imports and exports, without using a dedicated physical structure, managing third parties directly involved in these types of operation.

Company 6 – Specializes in kit line assembly, packaging and re-packaging of goods and magazine inserts. It has storage areas, equipment and assembly lines for these processes. The company has a great versatility and mobility of workers, performing large operations on a short-term basis. It also operates in retail goods distribution, particularly for bookstores and newsagents.

Company 7 – Works with dry goods storage, and has 4 storage units in metropolitan São Paulo. It also coordinates the transportation of goods to its units.

Company 8 – Participates strongly in supermarket chains. It offers vehicle rental to several segments, tailor-made, as well as management services and vehicle maintenance.

Company 9 – This is a service provider with about 30 employees, which acts in the maintenance and rental of storage equipment. It serves demand peaks for several clients, providing temporary vehicles and workers. It has know-how in the internal management of storage and transport equipment, servicing clients with technological tools developed over several years of experience.

Company 10 – This is a large customs warehouse facility for chilled and frozen goods. It provides selection and shipment services contracted by its clients, with some packaging lines on its premises for specific contracts. It also acts as an intermediary in transport services with partner companies.

Table 3, below, compares the activities executed by the 3PL and the 4PL providers. This table indicates the similarity of their activities, which makes them competitors in the market.

Since many activities in the supply chain are not carried out by the 4PL, they are carried out for the fast-food network by other companies from the 3PL group. Interesting aspects of this relationship come to light:

- Although they all compete with each other in many activities, the 3PLs generally do not allow this fact to generate a major conflict;
- Their mutual relationships favor the recommendation of each other's services, either among themselves or to other clients they serve. As an example, the 3PLs offer air transport, customs, packaging and maintenance services thanks to the recommendation of the 4PL.
- The fast-food network is aware of all these service providers, what they do for the 4PL and what they execute in the marketplace. This is a risk for the 4PL.

Table 3 – Main activities provided by the 3PL and 4PL of this study

The 4PL characteristics described in the literature correspond to those observed in this case study. There is relative difference in terms of assets. In this case study, the 4PL provider is strong in assets and in the direct execution of several activities, contrary to the literature, which suggests its role is restricted to the management of 3PLs, the actual executors of operations. Table 4 compares the 4PL described in the literature to the case studied here.

Table 4 – Comparison of the literature and the case study

Literature	Comparison with the studied case
The 3PL tends to become a 4PL	Three of the ten 3PLs clearly intend to become 4PLs
The 4PL is not based on assets, but on technology and know-how	The 4PL is a combination of assets, technology and know-how
Having IT support is a key feature of a 4PL	The 4PL is strong on IT, which is not always the case with 3PLs
The 4PL must build a strong commercial reputation	This aspect is important in the 4PL – its reputation is greater than that of the 3PL
The managerial scope of the 4PL is large in the chain	The 4PL acts in practically the entire chain
The 4PL is responsible for the chain's integration and focuses on adding value to the chain's business	This is a key aspect of the 4PL in the chain
The logistics strategy and operational structure are attributions of the 4PL	This also applies in the chain – 3PLs follow the 4PL
The 4PL focuses on the chain's business results	This is also true of the chain – with strong focus on key indicators for the chain

Complementary Considerations

Because the fast-food network has a strong name in the market, the agents mentioned in this study generally use the relationship with the 4PL as a differential in their efforts to recruit new clients. This seems to be one of the factors that improve the balance in their relationship with clients.

The largest 3PLs, especially those that have contracts with other large companies outside the supply chain of this study, display a certain interest in maintaining contact with the fast-food network, seemingly believing this will make them available to compete in an eventual new sourcing process. This indicates that, even if the relationship between them is professional and free of conflicts, their common interests make them potential competitors. However, they have generated new business with each other and

with suppliers of the fast-food network.

Another interesting fact observed here is the absence of 3PL management centralized in only one sector or department of the 4PL. Each 4PL manager is responsible for conducting the relationship contracted with the 3PL. If a 3PL can provide services in a different area, the 4PL managers reach an internal agreement about which contracting area is to manage the 3PL. Although the 3PL should carry out several activities, the 4PL tries to contract only their most specialized services.

Listed below are the main factors favoring the relationship between the 3PL and the 4PL that makes them cooperators and the principal conflicts that make them competitors.

Cooperators:

- The 3PLs cover services that the 4PL is not able to or not interested in executing.
- When contracted, the 3PL focuses only on the activity that is the object of the contract.
- The 3PLs know all the performance indicators they must satisfy, and the strict requirements of operations.
- The 3PLs trained employees in the 4PL to carry out the activities, guiding them in the characteristics of the fast-food network business.
- The 3PLs explore the chain, gaining new contracts through it.
- The 3PLs personalize assets for the operations of the fast-food network, according to criteria defined by the 4PL.
- Results are shared, following indicators guided by the businesses with the fast-food company.
- Providing services linked to the fast-food network adds value to 3PL businesses.

Competitors:

- The 3PLs know that the 4PL can invest in activities they execute, which would mean the end of business with the 4PL and the fast-food network.
- The 4PL knows that some of the 3PLs have the potential to work directly with the fast-food network, either in regional actions or even taking over all the activities.
- Investments in technology belong to the 4PL, which renders the 3PLs dependent on it in this area.
- The 4PL has, in the 3PLs, a tool to compare the price of services.
- For some 3PLs the service executed is marginal, representing little in terms of input, so they may abandon the 4PL.
- They all work with short-term contracts.
- Service prices are based on negotiations between the 4PL and the fast-food network, transferring the same adjustments to the 3PL.
- As the 3PLs expand their business, they become a threat to the 4PL.

- In terms of quotations and service pricing, there is implicit competition among the 3PLs and the 4PL.
- Participation in the management pattern between the 4PL and the fast-food network helps the 3PLs understand and learn this pattern.
- Most 3PLs lack the structure and assets that the 4PL has, especially the information technology that supports operations.
- The fast-food network does not appear interested in having more than one agent working within its supply chain operations.
- None of the 3PLs develop projects, a fact that hinders their expansion to more comprehensive businesses in the supply chain.

FINAL REMARKS

Analyzing the real case presented here it is possible to note a series of characteristics that help to understand the role of a 4PL to the management of several 3PLs. Also, the literature is clearly still in the phase of outlining concepts on the theme, and a "standard model" for this new logistics business has not yet been established. Even so, it was possible to establish a direct relation between the existing literature and the observations in this case study. Furthermore, one of the few points of consensus among the authors is that the 4PL will always be linked to the improvement of the SCM system and the service pattern should be based on integration and logistics solutions. This is clear in the pattern adopted between the fast-food network and the 4PL studied here.

A company operating along the lines of a 3PL would hardly be able to carry out all the activities in a supply chain. Furthermore, if companies began to contract logistics agents that are able to manage their chain, this would lead increasingly to the emergence of the figure of a 4PL.

The study also reveals that several factors characterize positions that make the 3PL and the 4PL cooperators, one complementing the deficiency of the other or even generating business between them. Other factors make them competitors, like the interest in fast-food company accounts, which is a new sourcing process. However, they work side by side and manage the conflicts, making the relation an interesting business for everyone, 3PLs and 4PL. With regard to competition, a key factor is information

management using information technology, which is a strong aspect in the business of the 4PL in this case study.

The study also indicates that the divergences resulting from the competition between 3PLs and 4PL can be managed without loss for the contracted operation. This reinforces the idea of logistics providers' flexibility, very present in the recent literature, demonstrating their facility in adapting to different environments and operations, and also revealing an aspect as yet little explored: the service of one complementing that of another in the same operation.

Finally, since this study was limited to only one case, we have avoided making generalizations and more comprehensive considerations. However, new studies would undoubtedly contribute further to the literature on the 4PL, providing a deeper analysis of what can actually be seen as activities and attributions of this industry, and how these activities may contribute toward integration in the supply chain. Another significant subject for investigation is the origin of new 4PLs, that is, if they evolve from 3PLs of other segments, and if this process is initiated by the clients or by 3PLs themselves. Undoubtedly there are still numerous aspects requiring investigation and many opportunities for research on this contemporary model of logistics management.

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