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NOTES – POSITIONS DE RECHERCHE

4PL and models of strategic alignment– A research note

Laurence Saglietto¹, François Fulconis² and Gilles Paché³

Abstract – *One of the most significant upheavals of the logistics industry is the emergence of a new generation of logistics service providers, called fourth party logistics (4PL). Their function is to provide the supply chain members with a customized service, based on a flawless coordination of logistical resources mobilized from the various firms. Considering the importance of IT, the research note suggests a conceptual framework on this subject referring to models of strategic alignment. Its aim is to know whether the 4PL are able to combine their business strategy, IT deployment and organizational performance efficiently so as to manage interfaces between the supply chain members in the best conditions. This leads to a number of managerial implications for the future of logistics service providers as coordinators of supply chains.*

Keywords – 4PL, Information technologies (IT), Strategic alignment, Supply chain management (SCM)

Résumé – *L'un des bouleversements les plus importants du secteur de la logistique concerne l'émergence d'une nouvelle génération de prestataires de services, dénommés fourth party logistics (4PL). Leur fonction est de proposer un service personnalisé aux entreprises impliquées dans le fonctionnement des chaînes logistiques, fondé sur une parfaite coordination de ressources logistiques mobilisées auprès de différents partenaires. Compte tenu de l'importance des TI, la note de recherche suggère un cadre conceptuel sur le sujet en référence aux modèles de co-alignement. L'objectif est de savoir si les 4PL sont capables d'articuler de manière efficiente stratégie d'affaires, déploiement de TI et performance organisationnelle pour gérer, dans les meilleures conditions, les interfaces entre membres des chaînes logistiques. Il en résulte un certain nombre d'implications managériales pour le devenir des prestataires de services logistiques en tant que coordonnateurs de chaînes logistiques.*

Mots clés – 4PL, Technologies de l'information (TI), Alignement stratégique, Management de la chaîne logistique

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1. INTRODUCTION

The logistics industry has been undergoing profound changes for about ten years under the pressure of new entrants. Thus, the most dynamic logistics service providers (LSP) are changing their organization and strategy to become dematerialized operators. They are developing a customized service for their customers by mobilizing resources and resorting to different partners and by making sure of its consistency thanks to a total control of information flows. The consultancy company Accenture called these LSP without physical assets the “fourth party logistics” (4PL). Their trade is to design and sell global supply chain solutions by coordinating the activities of carriers, storage operators, subcontractors, packaging companies, etc. The aim of this research note is to propose a conceptual framework on the evolution of 4PL to know whether they are able to combine their business strategy, technological deployment and organizational performance efficiently in order to carry through their role of coordinator. The interest of this approach will be obvious to the specialists of information society geography (Bakis, 2004). Indeed, 4PL development highlights the way companies initiate innovative practices in terms of IT management, and how the latter profoundly change the way exchange relationships between them and their partners are organized. Generally speaking, the fact that it is now possible to better compete with IT is a topical issue for all the LSP, as Alghalith’s (2005, 2007) recent analysis of FedEx and UPS cases shows.

The question of 4PL’s current role is important in a context of confrontation between the supply chains in which coordinating the logistical operations perfectly has become a prerequisite for developing sustainable competitive advantage. But understanding where the logistics industry is headed requires a two level analysis. On the one hand, it is necessary to assess the role of outsourcing in the logistical process optimization (*supply side*) and, on the other hand, to study the evolution of LSP’s activities (*demand side*). These two levels are closely linked as LSP –including 4PL– have embarked on a continuous improvement of their functioning procedures and on a rationalization of their organizational structure so as to develop a resolutely customer-oriented approach. They try first and foremost to ensure the effectiveness and efficiency of their organization by implementing a strategic alignment closely combining IT deployment, business strategy and the level of performance expected. We want to take part in the debate by bringing in the fundamentals of supply chain management, the part played by 4PL and the main models of strategic alignment. This will enable us, at the end of the research note, to raise a number of questions about both the stakes and limits of strategic alignment for 4PL.

2. FROM SCM TO 4PL

According to most observers, the logistical approach has undergone profound changes in its status and identity in most western countries. Restricted for a long time to managing a certain number of technical operations related to delivering product to customers (transport, warehousing, etc.), it is now considered as a key factor of success in developing a sustainable competitive advantage, notably because it enables firms to be totally customer-oriented. Besides, Colin (2002) writes that, in a few years, we have gone from a *gravitating logistics*, where supply prevailed in a mass economy, to a *monitored logistics*, in which demand prevails in a diversity and “hyper-choice economy”. This managerial revolution, which gave

rise to supply chain management, has gone hand in hand with an outsourcing process of unprecedented importance. It benefits a new generation of firms able to supply logistical services which are increasingly sophisticated (and high-performing) to manufacturers and large retailers.

2.1. Supply chain perspective

Since its military origins in the 19th century to the beginning of the 1960s, the logistical approach relied on the same basic principles, looking for the optimization of basic activities linked to the movement of men and supplies to the field of action, and of goods to markets and customers. Any manual on logistics management intentionally states that the academic subject and its application in companies first arose, then became organized, in order to efficiently manage transportation, handling and storage methods without any strategic desire to find a better coordination between these means. Magee (1968) was the first author to refer to logistics according to the model of the chain of activities linked by more or less strong solidarities. According to Magee (1968), the control of physical distribution is certainly essential to ensure the link between factories and outlets, via a network of warehouses; but downstream logistics must synchronize with manufacturing planning, and upstream with raw material and component procurement. Such synchronization relies on medium-term sales forecasts making use of programming tools such as Materials Requirement Planning (MRP) whose purpose is to lead to an efficient launching of logistical operations.

Heskett *et al.* (1973) went further by taking up the idea of a chain of activities, but with an inverted perspective: actual demand (not anticipated demand) is to trigger the chain. Monitoring from downstream was born and represented the real logistical revolution at the end of the 20th and the beginning of the 21st century, buoyed up with advances in information systems (IS). The “chain paradigm” is undoubtedly the origin of reflections which were to lead, after Heskett *et al.* (1973), to the wider notion of the “supply chain”. Mentioned for the first time in 1982 by two consultants in a little-known article (Oliver and Webber, 1982/1992), the notion was given wide media coverage from the 1990s onward under the acronym SCM for supply chain management. By nature, it considers logistics from a strategic angle above all, not an instrumental one, in reference to an “extended” firm stretching from suppliers’ suppliers upstream to customers’ customers downstream. We will therefore define SCM as *a set of managerial strategies and practices aiming at designing, coordinating and managing operations in the supply chain*. The objective is to create intra and inter-organizational synergies and the maximum fluidity of flows (at the lowest cost) by creating value for customers.

A supply chain roughly corresponds to a set of activities and operations supporting the logistical functions of raw material and component procurement with a network of first-tier and second-tier suppliers, of transformation and assembly of raw materials and components into intermediate or finished products, then of distribution to consumers, through distributors and retailers, with or without the support of conventional carriers and LSP (see the Figure 1). From this point of view, SCM can be examined from a general systems theory perspective, as Helou and Caddy (2006) suggest, as the whole is greater than the sum of the parts, thanks to continuous interactions between supply chain members. Understanding the operation of the supply chain leads us to refer to three distinct and additional levels of analysis: (1) a *design level*, of definition of borders and distribution of tasks within the supply chain (choice between *make or buy*, identification and localization of members, etc.); (2) a *coordination level*, of defining, adjusting and monitoring rules (production on stock or not, implementation of shared IS, contractualization of members’ reciprocal commitments, etc.); and (3) an *operational level*, of efficient organization of administrative issues linked to logistics and procurement (pacing of flows, stock management, etc.) (Merminod *et al.*, 2007).

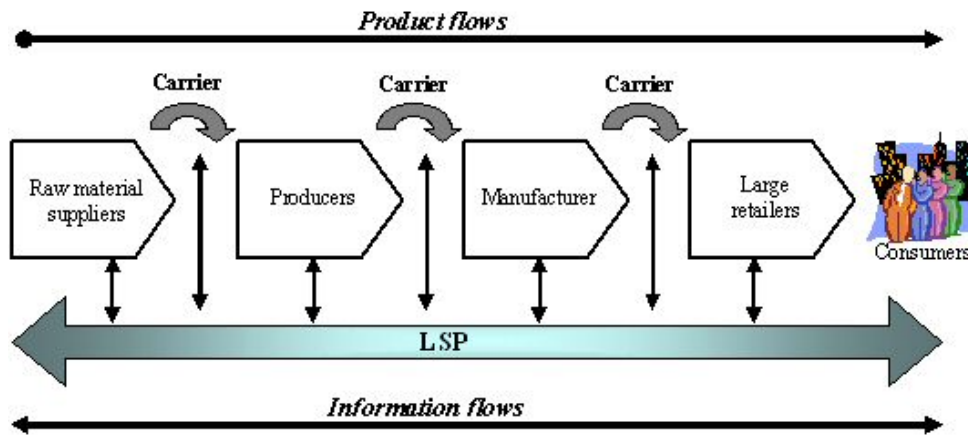


Figure 1. A conventional representation of the supply chain

2.2. Outsourcing process and the 4PL development

As time goes by, the number of manufacturing and retailing firms which no longer want to manage their logistics by themselves has kept on increasing in Europe and the United States. The reasons for this are widely known: restructuring the global supply chains to improve operations coordination; facing the fluctuations in the volumes and destinations of products to be dispatched; reducing costs and increasing service quality in terms of flexibility, deadlines and product customization, and adapting themselves to market globalization. More generally, a new age of capitalism has begun: that of massive logistics outsourcing by manufacturers and large retailers, even though for many years, having direct control of logistical operations was considered as the key factor of a sustainable competitive advantage and entrusting them to LSP would have been too risky. As for LSP, their supply has followed –and in certain cases anticipated– this new demand in three complementary ways:

- a reorganization by sectors and customers at the European level,
- the development of relationships with consultancy companies specialized in using management tools,
- the development of innovative procedures ensuring a perfect tracking and tracing of flows in collaboration with customers.

This new trend has led to two major trends. On the one hand, there has been an integration of information and physical flows between the actors of the same supply chain (i.e. the development of distribution hubs and just-in-time supplying between supply chain members, the implementation of collaborative processes); this brings about a fundamental change in information flow exchanges all along the supply chain and increases data transparency. On the other hand, there has been a new boost towards a change in the relations between actors aiming at optimizing both the buying process thanks to the Internet (electronic marketplaces creation) and the physical distribution process (sharing warehousing and transport resources). Supply chain monitoring indeed puts the emphasis on the volume of data exchanged between firms to trigger just-in-time logistical operations according to customer demand. LSP –including 4PL– must be able to transmit data between the supply chain

members as efficiently as possible, at the risk of generating breaks in the supply chain functioning (late delivery, mediocre/second-rate supplying plan, etc.).

What are the special features of 4PL compared with those of the transport companies and conventional LSP (see the Figure 2), which are themselves also involved in this radically changing logistics industry? The 4PL share an ability to carry out the activities of planning and coordination of information flows, designing both the logistical structure and the inter-organizational IS applied to the integrated processes along the global supply chains. By appropriating the new technological tools and combining them with conventional means, 4PL give a more informational orientation to their work. They aim at basing the string of logistical decisions on an electronic management of transactions, implementing interfaces to connect the management systems of the various members of the supply chains. As the services provided by 4PL are highly customized (van Hoek, 2004), they increase the interdependence between the partners thanks to common informational and organizational standards. In order to analyze and explain the key factors of success of 4PL, one refers traditionally to the current strategies of logistics outsourcing, which leads to more and more “dematerialized” supply chains in a new geographic space:

- *4PL and virtual company.* Several factors permit to characterize the 4PL as a virtual company. They can be summed up in four ways: (1) a systematic outsourcing of the implementation of the physical operations corresponding to their customers’ supply chain activities, since they do not have any asset such as trucks or warehouses; (2) an increased centralization of the key functions of both resource management and allocation, information flow planning and coordination; (3) a role of hub firm at the heart of a huge network of contractual relations; thus, through its optimization function, it integrates its customer, its customer’ customers, its suppliers, its suppliers’ suppliers, its LSP, etc.; (4) resorting widely to IT in order to coordinate a network of partners juridically independent from a large distance (Fulconis and Paché, 2005). Thus, the 4PL only devises a logistical architecture and the relevant IS development.

- *4PL and space dimension.* Information being the essential source of the value added generated by a 4PL, it is thus freed from localization constraints in two ways. On the one hand, both its functional and organizational space can be located anywhere in the world. On the other hand, the geographic space in which 4PL can operate is limitless by nature. In this case, space dimension, i.e. the geographic proximity with customers, suppliers and the various LSP, is not a factor in 4PL characterization. Nevertheless, its organizational as well as its technological proximity are of greater importance in the extension of its business network, since 4PL provides its customers with a global and totally integrated management of their flows of products thanks to an optimum monitoring of information flows.

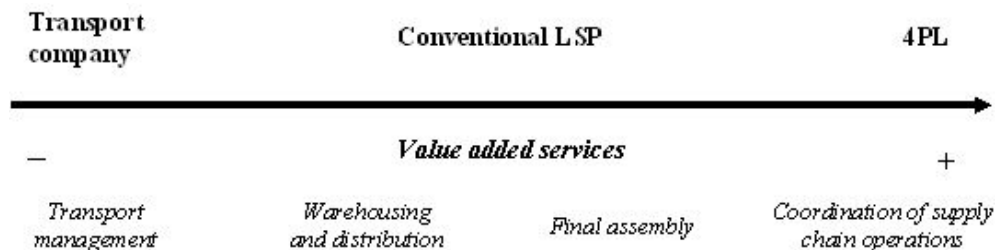


Figure 2. From transport company to 4PL

However, this approach is insufficient as it is only focused on the demand in logistical services. And it is also necessary to wonder about the way 4PL acquire the coordination and monitoring competencies step by step to facilitate the process which adjusts the conventional supply of LSP to meet this specific demand. Thus, if a few academic works are devoted to 4PL's performance, they do not sufficiently take into account all the determining factors of its evolution as a *transactional center* acting at the meeting point of a multiplicity of supply chains (Fulconis *et al.*, 2007). The co-alignment –or strategic alignment– models seem to be pertinent to highlight the part played by 4PL. They give a relevant conceptual framework showing how IS management is inextricably linked to supply chain management.

3. STRATEGIC ALIGNMENT

For about twenty years, the European logistics industry has been undergoing profound changes in the way manufacturers and large retailers manage supply chains together. Today, they want to rely on logistics specialists, entrusting them with managing activities such as transport or warehousing. A large number of works are devoted to the logistics outsourcing process explaining why this seems to be inevitable and what exactly are the activities outsourced by manufacturers and large retailers (for instance, see Lieb and Bentz, 2005). However, too little research is devoted to the strategic aspects of LSP's choices and their adequacy with the technological and organizational dimensions. LSP are relying on increasingly sophisticated technologies, notably in terms of information, and implementing very complex managerial procedures to increase the reliability and flexibility of the supply chains they are in charge of. Do LSP, and more particularly 4PL, succeed in carrying out an efficient co-alignment of these different dimensions?

There is a strong interaction between the structure of 4PL and their technological environment. Indeed, 4PL are nowadays the catalyst for the organizational change within the supply chains. The 4PL are involved in a governance based both on the management of knowledge and on a “specialization of architectural competencies” which gives them a nodal position in supply chains and, to a larger extent, in the value creation process. In this aim, they position themselves at the interconnection between the supply chain members –except LSP– and the logistics operators, managing thereby their interfaces (van Hoek, 2004). Here, the concept of *fit*, i.e. the alignment of many contingent elements which affect the firm and inter-firm performance, comes into play. The strategic alignment models developed for the past twenty years are based on the essential idea that organizational performance is due to the co-alignment of several factors: strategy, technology, structure, etc. These issues interest a growing number of researchers in IS management, strategic management and SCM. Their conclusion is that companies cannot be competitive in the long run without aligning their generic strategy –including logistics– and their IT (Henderson and Venkatraman, 1993; Earl, 1996). Some models also include people (culture, leadership) and processes (supply chain workflow) (Henderson and Venkatraman, 1993; Lee, 2006).

From a supply chain perspective, the strategic alignment is the result of two elements: on the one hand, a specific type of “business climate” (cooperation vs. arm's-length competition) and of organizational structure; and on the other hand, the use of IS at a specific level in a given social and cultural context. Thus, the use of IS results not only from the need for operational efficiency in the commercial, industrial and logistical transactions of the supply chain members, but also from the search for synergies: risk-sharing and strategic gains. The academic literature gives several theoretical models of strategic alignment. It will be interesting to apply the seminal models of Venkatraman (1989) and Henderson and Venkatraman (1993)

to the particular case of 4PL development. Other research followed but did not try very hard to assess them empirically and to make them operational except for Bergeron *et al.* (2004).

Indeed, we can think that 4PL are the actors of a strategic alignment since the more the synergies and coordination are developed within a supply chain, the higher its performance level is likely to be. As the role of a 4PL is to build up, dismantle and rebuild supply chains, making logistical resources coincide with the needs of the supply chain members becomes a key point. In order to assess 4PL co-alignment, we propose to refer to the diagram of Bergeron *et al.* (2004). It highlights the links between the strategic, structural and informational variables necessary to achieve a greater harmony. Thus, the Figure 3 gives an overall approach of the co-alignment formation; it draws two possible main guidelines. Any departure from one or the other can be considered as the sign of a significant gap between the firm's long-term aspirations (searching for a certain level of performance thanks to co-alignment) and the resources available at the time. For instance, a low level of information processing capacity will be incompatible with a proactive assertiveness and an analytical rationality, which would generate a state of strain which must be solved as fast as possible to avoid a decline in future performances.

This framework is based on the assumption that organizations will only be efficient if there is a link between their IT capacity, the strategy to be implemented and the structural choices to be made. The objective is to anticipate the required structural modifications early enough for the organization to be able to adapt to the strategy by referring only to the strictly necessary IT capacities. For instance, the organization structure will be different whether it chooses a strategy of diversification or a strategy of centralization of activities; it will then have either a multidivisional structure or a matrix one. Thus, the information flows circulating between departments or between headquarters and subsidiaries will not use the same communication channels. Likewise, the computer tools used to distribute the products of the firm on the market are different. We can conclude that the range of IT is the "mirror" of the firm's strategic and structural capacities.

Strategy				Information processing requirements	Structure			Information processing capacity
<i>Diversification/differentiation</i>	<i>Rationality</i>	<i>Assertiveness</i>	<i>Interaction</i>		<i>Centralization</i>	<i>Integration</i>	<i>Formalization complexity</i>	
One / same product service-market	Implicit intuitive short term	Reactive	One-person domination	Minimal	Centralized	Functional	Informal simple	Low
	↓	↓	↓	↓	↓	↓	↓	↓
Many/new products services-markets	Explicit analytical long term	Proactive	Consensus/bargaining	Extensive	Decentralized	Integrated	Formal complex	High

Source: adapted from Bergeron et al. (2004).

Figure 3. Information processing perspective of strategy-structure co-alignment

One should wonder about the relevance of applying co-alignment models to the particular case of 4PL. What are the benefits of studying simultaneously the links between business strategy, technological deployment and organizational performance? Does the impact of IT on 4PL result in a true revolution in flow monitoring, or is it merely a natural evolution of the logistics industry? To answer these questions, the research note intends to present some research questions on the strategic evolution of 4PL in Europe, influenced by a significant development of the supply in value-added services (see the Figure 2). In the wake of works integrating the network organization models to understand logistics industry trends, we intend to apply the dimensions of the strategic alignment of business and IT to assess the chances of success of the 4PL as a coordinator of supply chains. Following the example of Bergeron *et al.* (2004), the objective is to adopt a holistic approach to examine the impact of the fit among alignment domains on the firm performance.

4. AN APPLICATION TO 4PL

The legitimacy of our investigation suggested is reinforced by the publication of two recent studies. The first study is European. Carried out by TN Sofres Consulting for the European Commission, it studies the impact of IT on retail firm logistics. It deals with the current situation, transformation factors, changes in process and stakes. But after having emphasized the difficulties encountered in measuring the performance of logistical structures in general, nothing is said about the importance of the co-alignment of the supply chain members which support all the flows. The second study is American. It tries to answer the following issues: “Do supply chain IT alignment and supply chain inter-firm system integration impact upon brand equity and firm performance?” (Seggie *et al.*, 2006). The study is based on an analysis of the managers listed by the Council of Supply Chain Management Professionals, but it remains incomplete as the authors have ruled out the consultants, freight forwarders, conventional LSP and 4PL. Which amounts to ignoring the fact that 4PL are one of the most advanced forms of virtual organization logistics.

4.1. Research questions

One of the possible leads to assess 4PL's competitiveness consists in using the co-alignment process as a logistical monitoring tool. In this respect, the analysis of academic literature reveals unexplored fields regarding the 4PL's monitoring mechanisms and processes, but also and above all regarding the structuring role of IT, i.e. with regard to the configuration of exchanges within the supply chain. So, having a co-alignment measure turns out to be essential to understanding the 4PL's functioning as well as their performance levers and strategic and technological orientations. Compared with the classic approaches of performance measurement, co-alignment integrates a certain number of contextual, environmental and institutional variables. Thanks to adapted models, we can expect an answer to the following questions, which structure our investigation in four complementary directions (Venkatraman, 1989):

- *Strategy execution.* What business strategy is chosen by 4PL top management to develop a sustainable competitive advantage? Is it based on a cost leadership or a differentiation strategy?

- *Technology potential.* What kind of IS infrastructures is used, and on what IT tools are they based? How are the flow monitoring tasks carried out between the supply chain members at an operational level?

- *Competitive potential.* Does the exploitation of emerging IT capabilities lead 4PL to develop distinctive competencies? If so, are these competencies recognized by the supply chain members? What kinds of supply chain governance result?

- *Service level.* Does the use of IT resources enable 4PL to increase its level of responsiveness faced with fast changing supply chains? What are the procedures used to combine (and re-combine) logistical resources without being detrimental to the service level?

In a way, our investigation is a logical result of the research being carried out currently on 4PL (Fulconis *et al.*, 2007). Its objective would be to describe in detail some cases of 4PL development in order to recommend actions able to improve their service supply. With this aim in view, it is necessary to resort to a conceptual framework referring to both IS management and SCM. Our ambition is thus to make progress in the formulation of a general model of the logistics virtual firm, which emergence seems to be a profound brake in the 1980s and 1990s' supply chain dynamics. This is part of a more comprehensive and older project to better understand the foundations of logistics management based on an in-depth study of the organizational and technical means implemented in a given context. It is a momentous issue to propose leads to improve the functioning of organizations and, more generally, of business networks which are legally and geographically scattered in wider and wider area. 4PL could thus ease the tensions between the supply chain members regarding the use of scarce resources thanks to its role of transactional center capable of managing the cost of logistical interfaces sparingly.

4.2. Managerial perspectives

Strategic alignment is based on a convergence between business strategy, organizational structure and strategic choice in terms of IT (and the organization in charge.) It has several purposes according to the level of analysis it refers to. From a purely strategic point of view, it is the starting point of a process aiming at creating a sustainable competitive advantage and which, from an informational and cognitive point of view, tries to remove as many informational distortions as possible between the top management and the executives. From an operational point of view, strategic alignment contributes to implementing balanced scorecards (Kaplan and Norton, 2006). The general idea is then to rapidly get an overall approach to the business network's functioning and to develop a strategy respectful of a certain balance between the various priorities and actors.

But we must admit that nowadays most of the 4PL in the market, as well as the firm networks in which they are involved along the supply chains, still face a great number of difficulties in putting strategic alignment into practice. Two main reasons can be put forward:

- The first reason is 4PL's size and the "frontiers" of their business network. Every 4PL is not yet organized into a business network clearly built up on the basis of a totally integrated organizational form, i.e. with a structure relying on both a strong specialization of activities (specialized department so as to meet the specific requirements of the various supply chains) and a strong professionalization of the trades (revolving around the innovations of the R&D laboratories), which would enable to meet customers' requirements quickly.

- The second reason relates to the business network global strategy. When they develop their strategy, the 4PL and their customers do not always have a common line of action in terms of a business plan as every 4PL has the necessary means to succeed at its disposal. Thus, they often neglect to create: (1) an observatory of competitive practices and

risks; (2) an IT-oriented R&D laboratory to provide the business network with managerial and technical innovations.

From a strategic alignment perspective, the firm's organizational structure and business strategy are thought inseparable from an IS engineering strategy enabling a better spotting of development opportunities in new markets. Indeed, the alignment between IT and other variables is a key factor of success insofar as 4PL are first and foremost coordinators (or hub firms) specialized in the monitoring of the entire supply chain. They cover a very wide (often worldwide) geographical area and have acquired a strong expertise in IS by developing specific computer and organizational tools to meet the expectations of each of their customers. But to consolidate this key factor of success, these tools must not remain only at the 4PL level but must be spread out over the entire business network. Yet this dissemination remains purely theoretical for the time being. However, some mutations are in progress as 4PL are progressively consolidating their competitive position by integrating classical tools of information mediation (Fulconis *et al.*, 2007), which is a significant step towards a more efficient interaction between IT deployment and business strategy.

5. CONCLUSION

The research note deals with a particular type of LSP, which has aroused a keen interest since the beginning of the 2000s: 4PL. It represents unmistakably the managerial archetype of dematerialized economies in which value creation is mainly based on the ability to organize resources and competencies in a very reactive way, then to rapidly modify this organization if need be according to the changes in the environment. According to Fabbe-Costes (2007), the prevailing business model has thus become, step by step, the one of *fast changing supply chains* whose lifespan is limited over time, sometimes lasting only months or even days. 4PL have undoubtedly understood before other supply chain members the new reality of a market which is increasingly fluid, globalized and volatile. In this market, the most important thing to develop a sustainable competitive advantage is indeed more to know how to manage interfaces than to want to have direct control of physical assets at any cost (factories, warehouses, transport and handling facilities, etc.).

The management of interfaces requires using some IT efficiently enough to enable to trigger just-in-time logistical operations according to the products the customer wants to acquire often with very short deadlines. By focusing our analysis on the use of IT within the supply chains and trying to examine the compatibility between IT use, business strategy and organizational performance on the basis of strategic alignment models, we wanted to provide 4PL top management with leads to their true key factors of success. Indeed, there is a major risk of thinking that only a technical mastery of computer tools will enable 4PL to capture new markets, notably by improving the tracking and tracing processes. On the contrary, the foundations of competitiveness lie probably in 4PL ability to increase their level of responsiveness faced with fast changing supply chains, which requires adopting less rigid organizational structures, more open to innovation and change. That is one of the main difficulties to overcome and, admittedly, it has not yet been given the necessary attention in the academic research dedicated to networks.

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