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## Supply chain monitoring: LLPs and 4PL providers as orchestrators

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### Abstract

In the past three decades, many firms have chosen to outsource logistics operations management to specialized suppliers called logistics service providers (LSPs). This managerial reality has been described and analyzed extensively in academic studies in marketing, strategic management and logistics management. More recently, a new generation of providers, called LLPs (*lead logistics providers*) and 4PL (*fourth party logistics*) providers, have radically altered the logistics industry. They notably offer complete logistics service without necessarily possessing the physical assets (means of transport, warehouses, etc.). These providers are gradually becoming orchestrators within supply chains. This article explores this little known reality that portends a strategic disruption, based on a case study of a global LSP.

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### 1. Introduction

The logistics industry has undergone an unprecedented evolution for at least three decades, in terms of geographic reach (initially Europe, North America, and Asia, and more recently North Africa and South America) and of transformation of the role of logistics. Transport or warehousing specialists have long been considered more than simple executors of logistics operations for their clients. In the current economic system, particularly since the

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1980s, many transport actors have become pivotal to contemporary logistics plans. By expanding their offer of value-added services, these logistics service providers (LSPs) even enable numerous shippers in industry and large retailing to implement their development strategies at the national and international levels.

The LSP traditionally fulfils the function of logistics intermediary by arranging storage, order preparation and final delivery of products for its customers. It is ideally placed to organize pooling of logistical resources, and thus help supply chains achieve substantial economies of scale and scope. Studied extensively for years in academia (Fulconis, Paché & Roveillo, 2011), the LSP sector has witnessed the rise of an innovative category that disrupts the previous business models: lead logistics providers (LLPs) and fourth party logistics (4PL) providers. The latter result from a process of slow complex maturation punctuated by a series of organizational innovations. Arthur Andersen Consulting, which became Accenture, was the first to introduce the notion of 4PL provider, in the mid-1990s. Since then, the literature has avidly embraced this subject.

As orchestrators, LLPs and 4PL providers organize and coordinate flows of products for shippers, by mobilizing the logistical capacities of a large number of subcontracting firms. Whereas the managerial literature has quickly grasped this phenomenon, the emerging character of this new generation of LSP, marked by dematerialization of logistical services, remains largely unknown and underexplored. The objective of this paper is to shed light on the ongoing evolution of the role of LSP through an organizational and strategic approach toward steering of business-to-business logistical flows (section 2), and to analyze the competitive advantage of LLP and 4PL provider, supported by a case study (section 3). The conclusion applies the metaphor of improvisation within jazz ensembles to highlight the originality of the current evolutions in supply chain monitoring (section 4).

## **2. LLP and 4PL provider-From an inter-organizational perspective**

For many years, academic studies of logistics outsourcing have explored the reasons that shippers outsource, along with the nature of outsourced activities and the firms that manage some or all of these activities. The perspective adopted is that of a technical negotiation between buyers and sellers of logistics services, notably entailing the definition of specifications, formalization of contractual clauses and renewal or termination of the outsourcing relationship. Although this perspective is still relevant, it cannot provide a sufficiently robust framework to encompass the evolution of logistics outsourcing, particularly the emergence of a new family of LSP whose competency is mainly to monitor supply chains, specifically supply chain networks. These new LSPs are no longer mere executors of outsourced logistic activities. On the contrary, they coordinate flows, which makes them a driving force behind proposals in the logistics reengineering process. Rather than owning physical assets, they mainly or uniquely possess orchestration skills.

### *2.1. The LSP, between chain and network*

The supply chain refers to multiple actors that interact recurrently to carry out all the activities related to production and provision of products to customers. In an increasingly complex, competitive, turbulent, and globalized environment, it is crucial to understand how industrials, large retailers, component suppliers, wholesalers and LSPs interact to manage the flow of merchandise and information effectively. Many LSPs now fuel the development of emerging countries by implementing major infrastructures to improve the performance of procurement and deliveries. For instance, SME in Romania benefit from the expertise of foreign LSPs that have invested massively in storage and transportation capacities for several years (Kherbach & Mocan, 2016). Among the more significant changes in the structuring mode of supply chains, the emergence and consolidation of LSPs on the global scale are particularly noteworthy. Long limited to basic and technical activities of transport and storage, which create little added value, the logistics industry has become much more prominent. World-class LSPs like XPO Logistics, Kuehne+Nagel, Geodis and DHL can now provide postponement services that resemble those of assembly plants. The growth of LSPs results from the outsourcing of transportation and logistics activities driven by shippers for over three decades. Today, this reality is well known, and has been covered extensively in many works (Fulconis, Paché, & Roveillo, 2011). In parallel, definitions of LSP have burgeoned. The model of 3PL provider, LLP and 4PL provider, to which a growing body of literature is dedicated (Hingley, Lindgreen, Grant, & Kane, 2011; Huang, Tu, & Xu, 2013; Saglietto & Cézanne, 2015), constitutes one of the most emblematic illustrations of this phenomenon (see Exhibit 1).

### Exhibit 1: What are 3PL provider, and 4PL provider?

3PL (third-party logistics) specializes in execution of physical activities linked to transport, handling and storage of products for shippers. These activities may be supplemented by high added value activities like co-manufacturing, co-packing, cross-docking, pooling, and reverse logistics. 3PLs generally operate in the road transport sector. By comparison, the activities of LLPs (lead logistics providers) and 4PL (fourth party logistics) providers are executed by an LSP “that assembles its own resources, capacities and technologies, and those of other providers, to design and steer complex supply chains” (DGITM, 2010, p. 2). Whether they own the means of production, warehouses and trucks (case of LLP) or not (case of 4PL provider), these LSPs mobilize their logistics engineering competencies to optimize flows and select the best providers. They are thus stakeholders that coordinate activities between the shipper, end customer and sometimes other 3PL providers. LLPs and 4PL providers may be 3PLs that diversify their offer, management consulting firms, supply chain specialists (global supply chain management) or IT services companies.

Numerous factors, both operational and strategic, lead shippers to delegate their logistics activities. From an operational viewpoint, they are mainly seeking to reduce costs and improve performance. By hiring an LSP, shippers hope to benefit from economies of scale and make costs more variable than if activities were executed in-house. Performance is thus improved and more easily measured owing to higher cost transparency. In addition to putting in place indicators related to their activities, through their management of different interfaces linked to various supply chains, LSPs make it easier for shippers to analyze internal dysfunction. The activities concerned are most often standard logistics services linked to low-margin mass products. From a strategic viewpoint, outsourcing often reinforces shippers’ competitive advantage, because they can access high-quality external resources while benefiting from the LSPs’ reactivity and innovation competencies (Kacioui-Maurin, 2012). To better satisfy customers’ needs, LSPs must then be a real driving force behind proposals to improve flow monitoring. In fact, their central position in the supply chain network facilitates assimilation of tacit knowledge of effective management of logistical operations in various contexts.

Whether at the local or global scale, these explanatory factors highlight the predominant role of LSPs for shippers who want to retain control of the conception of their supply chain. However, by significantly expanding their service proposal, some LSPs project an image of a preferred support for implementation of the specialization strategies of shippers that are looking for reliable and effective partners to steer logistical interfaces (Fabbe-Costes & Rousset, 2011; Fulconis & Saglietto, 2015). These LSPs thus become indispensable entities in supply chain monitoring, and even in implementation of business-to-business cooperation strategies whose organizational response corresponds to specific structural forms. Well known for almost 30 years, these forms are described as network organizations or virtual organizations (Håkansson & Persson, 2004; Petrișor & Petrache, 2014; Christopher, 2016). To the surprise of many observers, convinced that material investment is a source of omnipotence, some advanced LSPs have realized that their acquired monitoring expertise enables them to implement innovative logistical architectures without needing to possess multiple physical assets, or resources. Rather, they must mobilize them at the right time and place for carefully selected partners. This new generation of LSPs, called lead logistics providers (LLPs) or fourth party logistics (4PL) providers, has radically transformed the organization and functioning of supply chains.

#### 2.2. Orchestration capacity, a core competency of LLP and 4PL provider

The LSP positioned as an LLP and/or 4PL provider typically prolongs and supplements the role of the 3PL provider. It consists of conceiving and selling personalized logistics solutions by creating a type of *ad hoc* assembly of resources mobilized either internally or through carriers, warehouse managers, industrial subcontractors, etc., or by combining both possibilities (Quillaud, 2012). Therefore, it is possible and sometimes even desirable for the LSP to assemble a service proposal without necessarily owning very costly physical assets. In the conventional logistics industry, diverse assets are required for the conduct of the servuction process: physical assets (e.g. semi-trailers, information technology, on-board computing), site assets (warehouses, platforms), human assets (technical and managerial competencies), reputation assets (brands, visual identity) and organizational assets (procedures, routines) (Allam & Lendjel, 2009). This is also the case of LLP, yet not of “pure” 4PL provider, which claim to be “*asset-free*”. In fact, 4PL provider build legitimacy among shippers based on their coordination expertise. They specialize in orchestration of assets held by all the partners, which have recognized expertise in a particular “logistical brick” (product shipping,

warehousing, order preparation, etc.) (Mehmann & Teuteberg, 2016). Organizational theory states that coordinating means setting in motion an articulated set of means and resources to attain a performance objective (related to costs, service, or reactivity). The success, or failure, of the LLP, and especially the 4PL provider, is thus judged based on its capacity to orient and steer the activities of interdependent units within a supply chain to attain an objective.

Currently, there are several dozen LSPs in France, some of which may act as LLP according to their customers' needs and the level of maturity of the supply chain, yet there are only about twenty 4PL providers on the European market. They are mostly traditional LSPs that are partly or totally reconfigured into dematerialized providers (Saglietto, 2013; Saglietto & Cézanne, 2015). Other LSPs are companies whose expertise rests mainly on consulting and/or sale of ERP software solutions. The common point of all these firms is that they coordinate information flows by simultaneously establishing the architecture of a supply chain and the applicable interorganizational information systems. Van Hoek (2004) specifies a typology of the distinctive elements of traditional LSPs, and those of LSPs that position themselves as 4PL providers or LLPs. Certainly, the information dimension is a major element of the offer of the LLP or 4PL provider, because its function of orchestrator requires perfect traceability of flows, along with real-time monitoring of the performance of partners in charge of providing “logistical bricks”; as underline by Schramm, Czaja, Dittrich, and Mentschel (2017), IT capabilities appear then to be an important differentiator for 4PL providers. Although response time is particularly important, other dimensions are also significant in distinguishing the new generation of LSPs from “classic” LSPs: lesser dependence on shippers, whose interfaces also require ad hoc monitoring, a multiplicity of contact points with supply chain members, etc.

By relying on physical and site assets held by an extended network of partners to serve a given client, the LSP (LLP or 4PL provider) acts as an orchestrator, which grants it a central position in supply chain organization (see Fig. 1). Having accumulated recognized expertise in management of physical flows by information flows, and a capacity to assemble multiple complementary resources, this type of LSP departs from the “classic” activities of logistical service provision that revolve around the specific implementation of flows. These LSPs represent the forefront of a new generation, marked by effective management of the complexity of dimensions that are both organizational (offering clients a customized service for a very short time) and operational (identifying and moderating a set of partners that are unaware of one another, and whose interoperability is not assured). In this case, the role of the LSP is to conceive and sell turnkey solutions by coordinating complementary activities of transport, handling, storage, subcontracting, packaging, etc. It thus differs from the traditional LSP whose effectiveness on the logistics service market is linked to its ownership of sufficient material resources, most often measured in terms of storage means and a fleet of vehicles.

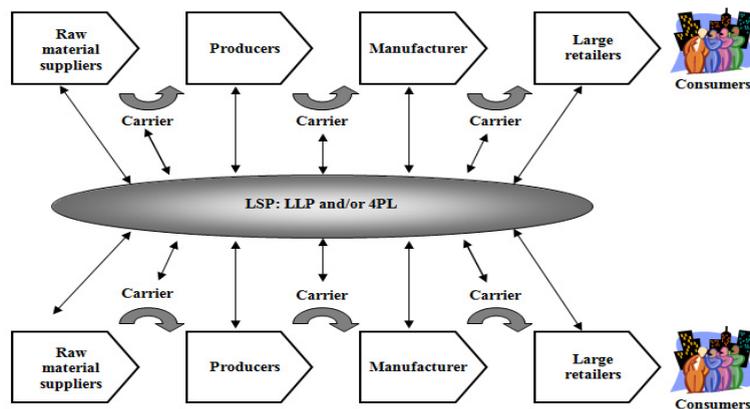


Fig. 1. LLPs and 4PL providers as orchestrators in the supply chain network

Source: The authors.

### 3. Competitive advantage of LLP and 4PL provider-A case study

The rapid development of LLPs and 4PL providers was fueled by the capacity of these new LSPs to respond effectively to the agility requirements and thus ensure the ability of supply chains to withstand frequent and

sometimes brutal changes in the external environment. LLPs and 4PL providers exhibit exceptional plasticity in implementing turnkey solutions, by constantly reconfiguring the logistics operations they direct. Metaphorically, LLPs and 4PL providers are comparable to the human brain, whose neuroplasticity lets it constantly remodel its connections according to its environment and individuals' experiences. Morgan (2006) advocated the pertinence of the image of the brain in his analysis of organizations. Although we must avoid overreliance on metaphorical approaches, it is useful to understand the success of LLPs and 4PL providers. An illustrative example is that of Kuehne+Nagel, whose most recent transformations indicate that supply chain orchestration is at least as important as simple execution of activities for shippers.

### 3.1. Exploring the reasons for success

For most observers, the success of LLP or 4PL provider is linked mainly to their abilities to steer and coordinating flows. Conventionally, within supply chain monitoring (Fabbe-Costes, 2005), interface management within a supply chain tends to favor formalized knowledge, or monological data, represented aptly by EDI. Lièvre (2002) describes "rational" message-centered information, which is considered a physical object. This formalized knowledge can allow firms to arrange resources (which we refer to as "logistical bricks") at the lowest cost because the partners use a universal language that is independent of their technical and organizational characteristics: "*Companies collaborating with a neutral 4PL already share information with it, so that the horizontal collaboration does not require the direct sharing of information with new partners in addition to an expensive investment in additional information and communication technology*" (Dircksen & Magnin, 2017, p. 825). The resulting standardized interfaces have the advantage of easily replacing one logistical brick, e.g. a warehouse, with another. Coordination of inter-organizational interfaces is thus independent of the nature of the logistical brick, and of the actor that operates it.

This organizational form has engendered an important value creation process (Win, 2008). The revolution it sparked may not have been duly recognized, especially when 4PL provider is simply viewed as a new generation of forwarding. The common point of all the firms that position themselves as LLPs and/or 4PL providers is that they carry out planning and coordination of information flows, by designing both the architecture of a supply chain and the related information systems (Paché, 2009). In the extreme case, "pure" 4PL providers position themselves as a dematerialized assembler of resources and competencies, without having the physical assets, thus reproducing the archetype of *non-asset companies*, where the shipper is only a specialized intermediary providing a liaison between two transport modes as instructed (Belotti, 2015). The 4PL provider also sells a global logistics solution based on its capacity to create instantaneous connections between suppliers and requesters of logistics services, sometimes for a few days. The formulation and leading of supply chains with variable geometry is therefore the basic role of the LSP, the rationale for its offer.

LSPs (LLPs or 4PL providers) that serve large retailers and industrials have several distinct characteristics. Such LSPs are positioned as architects whose key function is to build, dismantle and rebuild a supply chain, while coordinating it under optimal cost and service conditions. The coordination results from consideration of the singularities of the objectives of different partners associated within the same supply chain, and from the interoperability of their information and management systems (Fulconis, Paché, & Roveillo, 2011). Acting as an exclusive partner (a type of "one-stop shop"), the LSP reconciles the needs of several firms through an advantage in terms of negotiation and networking. Coordination is expressed at varied operational levels, notably concerning storage, shipping and final delivery. To reach this objective, the LSP uses real-time flow monitoring tools to achieve total traceability of operations, an indispensable condition to maintain a high level of strategic flexibility, which Reix (1979) calls activation of potential. The LSP (LLP or 4PL provider) thus develops cumulative knowledge of multiple logistical problems, more or less ephemeral, that enable it to facilitate and orchestrate the supply chain.

How can we explain this evolution? One of the specific features of the LSP (LLP or 4PL provider) is that it occupies an axial position in several supply chains, embedded within one another in value networks; this reflects the *supply chain network economy* discussed by Zhang, Dong, and Nagurney (2003). The LSP acts as a transaction center that mobilizes a competency of intermediation that contributes to the fluidity and continuity of physical flows. For example, a carrier mobilized by a 4PL provider at time  $t$  may participate in several distinct supply chains, which share a common link (the carrier) for a given period. This also explains the popularity of the term

*orchestrator*, which is an actor that can align the objectives of actors in the supply chain around a common performance objective (Bitran, Gurumurthi, & Sam, 2007; Zacharia, Sanders, & Nix, 2011; Shaharudin, Zailani, & Ismail, 2014; Chen, Cai, & Song, 2016). By acquiring a profile of *orchestrator*, the LSP portrays itself as an integrator of logistics solutions for different value networks, and it capitalizes on the knowledge gained from its previous experiences to build expertise that will let it increase its responsiveness in the constant reconfiguration of its service proposal. The dynamism of the LSP notably involves identifying best alternatives for transport, inventory management, storage site implementation, etc., as part of an ephemeral supply chain.

Ultimately, value creation by supply chain actors is structured around an ability to organize resources and competencies in a responsive manner. LLPs and 4PL providers have extended their fields of competencies while structuring the logistics industry around coordination and orchestration activities. Described as assemblers of competencies that propose a broad palette of versatile services, they develop unique expertise in building value networks in concert with partners and other LSPs with complementary skills. Consequently, LLPs and 4PL providers put propose a global innovative offer through their expertise, independence and capacity to quickly build and dismantle highly responsive supply chains. By improvising in their steering of flows based on the “partition” indicated by the shipper, they exhibit plasticity that reflects the current trend in an ever-moving economy, and must adapt instantaneously to an increasingly turbulent environment. The fundamental distinction between the LSP as a simple supply chain member and the LSP as a supply chain orchestrator can be summarized in the following main points:

- The LSP as a simple supply chain member is above all an executor of more or less sophisticated logistical operations on a shipper’s behalf, within a dyadic relationship. A shipper’s request that an LSP reorganize its supply chains falls within the framework of a strict set of specifications that are co-defined by the two partners. The managerial and technical innovation that the LSP introduces thus corresponds to satisfying a precise and rigorously standardized need, primarily for a single shipper within a dedicated contract, but which can then be disseminated to other shippers within shared contracts.
- The LSP as a supply chain orchestrator is mainly a creator of customized logistics solutions for a large number of shippers. The LSP’s objective is thus to assemble, upon request, different “logistical bricks” that are designed and executed by its partners. Beyond the orchestration capacity, the key attributes of an LSP regarding a supply chain network are consequently the ability to identify the most effective offers of logistical bricks, and to maintain a high level of partner commitment to achieve excellence and for partners to feel involved in executing logistical operations not directly for a shipper but for an LSP.

### 3.2. *Kuehne+Nagel, a global logistics network*

The longitudinal case study of Kuehne+Nagel is taken from an ongoing large-scale exploratory research project that began in 2007. Adopting the qualitative methodology suggested by Hlady-Rispal (2002), this study examines the evolution of the logistics industry in Europe; as Houé and Murphy (2017) underline, a qualitative approach is highly relevant to map the nature of relations in logistics networks. Several LSPs, whose offer is mainly directed at shippers within BtoB relations, are regularly observed via interviews (see Exhibit 2). The companies investigated are Geodis, XPO Logistics, FM Logistic, Stef, Daher, Rhenus Logistics, Panalpina and Kuehne+Nagel. Kuehne+Nagel was retained for this paper because its current development appears to be strongly linked to or even induced by existing and possible relations with some of its most important shippers, which the LSP perceives as a real source of innovation. Founded in 1890 in Bremen, Germany, Kuehne+Nagel is currently a global leader in logistics and supply chain management (SCM). In 2016, the company had over 63,000 employees specializing in logistics, and more than 1,000 offices in over 100 countries. Of its 6,000,000 m<sup>2</sup> of storage area, 1.5 million are situated in France. Its dominant sectors of expertise are the aeronautics industry and automobile, retail, agri-food, logistics of controlled temperature products, convenience goods, high tech, door-to-door logistics and onsite industrial logistics for manufacturers.

#### Exhibit 2: Main elements of the exploratory research project

The main unit of analysis retained is the logistics industry made up of LSPs. It is supplemented by three other underlying units of analysis: interorganizational relations, supply chains and business networks (set of chains). To date, data have been

collected through semi-structured interviews (primary data) based on a guide with the following dominant themes: positioning of LSPs in terms of services (basic, value added), evolution of supply and demand for logistics services, outsourcing vs. insourcing processes, the nature and evolution of relations between supply chain members (power of influence, shared risks, etc.), monitoring of information flows (issues, threats, technologies deployed, etc.), logistical performance and global profitability. The people surveyed at industrials and large retailers are logistics or sales managers, together with logistics division managers at LSPs. To allow triangulation, secondary information such as companies' annual reports and companies' Internet sites were examined, and the trade press was reviewed.

The firm's extensive experience in seafreight and airfreight enables it to naturally carry out complementary activities of storage, overland transport and distribution. Grouped under the heading *logistics execution*, these fairly basic activities quickly made Kuehne+Nagel, like many other LSPs, dependent on its shippers. The operational activities concerned did not correspond to critical purchases for shippers. In addition, LSPs often faced the following dilemma: how could they streamline supply chains by achieving large economies of scale for shippers, while generating sufficient sales and margin to ensure their own survival. Since the 2000s, to reduce its vulnerability, Kuehne+Nagel evolved its business offering toward activities that create more added value. Now called *logistics management*, its offer rests on logistics integration and flow monitoring using control towers (Roveillo, 2015). Kuehne+Nagel thus reinforced its engineering competencies while retaining its indispensable physical and site assets to propose *logistics execution*. Kuehne+Nagel stands out from "pure" LSP type 4PL providers, which are neutral and separate from all physical assets. It portrays itself as an orchestrator, a full-service LLP that can offer its shippers a complete package of logistics solutions (see Fig. 2). To do so, it mobilizes its own capacities in terms of transport and storage, along with its capacities competencies in coordination of information flows, and steers clients' logistics flows on an expanded territory.

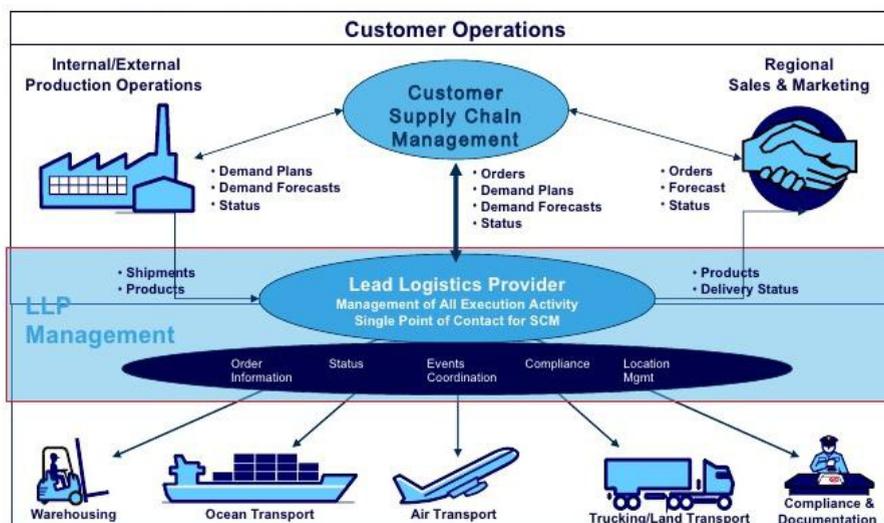


Fig. 2. The lead logistics solutions of Kuehne+Nagel  
Source: Company document (2011).

The analysis shows that if some rebalancing of its relations with shippers was profitable for Kuehne+Nagel, its situation was still precarious. The threat of dependence on shippers led Kuehne+Nagel to innovate considerably, both technologically and organizationally, to convince shippers of its "strike force" and the "coherence" of its service proposal and its capacity to assist clients in their development during strategic changes, like when they increase their business volumes or move to other parts of the world. Technically, for shippers, Kuehne+Nagel's offering mainly consists of: proposing solutions to permanently reduce logistics costs, implementing a continuous improvement approach, logistics networks optimization and process integration. The firm uses personalized logistical monitoring to coordinate flows and processes throughout supply chains. However, to be efficient, Kuehne+Nagel's approach must be implemented over the long term. "We must constantly reinvent ourselves,

achieve critical mass and communicate our offer logistics management in BtoB,” a Kuehne+Nagel manager explained. We also observed more organizational and managerial innovations that led the LSP not only to diversify its service offering to differentiate itself and maintain a strong impact on profitability, but also to implement cooperation strategies with its shippers.

Concretely, Kuehne+Nagel’s approach leads supply chain members to requalify their relationship and build a climate of trust with regular long-term interactions. They aim to share the gains resulting from the customized solution proposed by the LSP, which requires sharing of information to really understand clients’ *business*. A stable core of the LSP’s employees is dedicated to each client, according to the renowned principle of key account managers (Wilson & Holt, 2014). This reinforces relations between supply chain members and allows Kuehne+Nagel to create value by analyzing all the data of each shipper in terms of logistics flows. Further, a set of contracts, generally a framework contract accompanied by several subcontracts or riders, sets the conditions of the relationship. Most are renewable every three to five years. To summarize, in its *integrated logistics* offer, Kuehne+Nagel’s strength lies in its capacity to accompany its shippers through changes *via* a modular offer, by proposing customized services that simultaneously combine its operational competencies as orchestrator of both *logistics management* and *logistics execution*. Shippers thus obtain advantages resulting from a relationship of interdependence in which logistics solutions are grounded in coordination competencies.

The Kuehne+Nagel case also seems to be an excellent illustration of the disruptive strategies that some LSPs introduce. Until the early 1990s, the term disruption was perceived negatively. The English Oxford Dictionary (<https://en.oxforddictionaries.com/definition/disruption>, Accessed July 8, 2017) still defines it as “*a disturbance or problems which interrupt an event, activity or process*”. This vision has been seriously questioned following the seminal contribution of Christensen, Craig, and Hart (2001) regarding the success factors of US businesses relative to Japanese firms after decades of economic downturns. In a more proactive than adaptive logic, a disruptive strategy corresponds to a creative process that can generate solutions that stand out from previous routines. In other words, a disruption is when a company breaks with conventional thinking to accelerate the creation of a new vision of management (Christensen, Johnson, & Rigby, 2002; Gans, 2016). The emergence of LLPs and 4PL providers, of which Kuehne+Nagel is one of the most dynamic examples, typifies the concept of a disruptive strategy. The traditional and routine approach of the logistics industry is based on the accumulation of physical assets to deploy complex logistics services; only large LSPs are able to raise the funds to fulfil shippers’ requests. In contrast, the disruptive strategy emphasizes that agile LSPs with modest financial capacities may build and dismantle ephemeral supply chains very rapidly using the resources of multiple partners. Clearly, the core competency of agile LSPs is that they possess a large relationship network and that they are able to mobilize the right logistic resource at the right time. This implies a new convention of thought regarding the perception of the relationship between the LSP and its shippers based on the implementation of a disruptive innovation.

For Kuehne+Nagel, like other powerful worldwide LSPs, the threat of new entrants in the logistics industry in the form of pure 4PL providers is a reality that must prompt reflection on key factors of success to build shipper loyalty. These key factors fall into two categories. First, the presence of physical assets is an asset for LLPs because they reassure shippers that may question whether pure 4PL providers can competently build supply chains based uniquely on external resources. Second, the existence of long-standing relationships between LLPs and a large number of shippers allows step-by-step creation of *expert power*, as described by French and Raven (1959). LLPs can thus prove their professional competency in terms of knowledge and abilities, which creates a situation of relative dependence for shippers. Kuehne+Nagel would surely benefit from implementing a real storytelling approach that integrates these two key factors of success, to demonstrate to shippers that only an LSP with strong historical roots in the logistics industry can foster its clients’ supply chain development.

#### 4. Conclusion

Previously an esoteric theme of interest to only a handful of management researchers, the logistics model of the new generation of LSPs (LLPs, especially 4PL providers) can illustrate the foundations of effective strategic action (Kacioui-Maurin, Lazzeri, & Michon, 2016), a topic of universal relevance. The Kuehne+Nagel case is undeniably an emblematic example of how innovation in terms of services and technologies indeed plays a central role in the effectiveness of the strategic actions of LSPs: the company has carried out a successful disruptive strategy that led it

to become a global leader in the logistics industry, particularly by knowing how to grasp unexpected growth opportunities. Since the 1990s, many works have shown how improvisation based on the exploration of unexpected opportunities that let organizational structures adapt to continuous disruptions is an approach of primary importance (for a recent synthesis, see Hatch and Cunliffe [2013]). Improvising most often entails “bricolage,” in the sense of Lévi-Strauss (1962), which implies creative arrangement of disparate resources from different sources. In this case, LSPs capture highly “liquid” resources, assemble them temporarily and dismantle them when the project is over. The bricolage of genius is undoubtedly the outcome of the logistical model of LLP and 4PL provider, which constantly improvises new supply chain monitoring plans based on a dynamic assembly of resources, which rest on memorized action plans, similar to how a jazz ensemble develops variations that are intuitive yet based on fully controlled harmonic chains.

As the works of Barrett (1998), Zack (2000), Kamoche and Cunha (2001) and of Kamoche, Cunha, and Cunha (2003) illustrate, musicians in a jazz band maintain a coherent game with one another because they all use the same referential. They possess minimum knowledge structures that can limit uncertainties in their response to a tonal variation by the other members (Hodson, 2007). Undoubtedly, contemporary supply chains, faced with successive waves of changes regarding both technologies (Internet of things, big data) and purchasing behaviors (mass customization, need for quick execution in product provision, at the lowest cost) must learn to improvise. To do so, they need an actor that can build robust harmonic chains that serve as a common referential for different actors. This is precisely the role of LLPs and 4PL providers, whose intimate knowledge of various musical scores, that is, of formalization and monitoring of diverse supply chains, well equips them to improvise and arrange actors in multiple contexts.

The Kuehne+Nagel case notably underlines that the competitive advantage of LLPs and 4PL providers rests on an ability to demonstrate to shippers that their expertise in orchestration is enduring, versatile and difficult to imitate at an acceptable cost. Some shippers may presumably be able to independently choose a set of partners to build their own ephemeral supply chains. However, orchestration incurs coordination costs that LLPs and 4PL providers have greatly reduced owing to their experience in terms of flow monitoring. This experience rests on the abundance of contexts in which they operate, whereas shippers naturally focus on only one type of supply chain. This may explain why 4PL providers are currently able to manage both humanitarian logistics campaigns and procurement for supermarkets as part of short-term promotional campaigns. The new generation of LSP has developed high operational flexibility, in the sense of Reix (1979), which implies an ability to adjust logistics capacities upward or downward in response to demand. From this point of view, the logistics industry is a particularly interesting illustration of emerging management models whose effects are clearly disruptive.

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