Logistics Outsourcing: A Review of Basic Concepts

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***Abstract*— The proliferation of new information technologies, intense business competition, transactions acceleration, rapid product obsolescence, shorter product life cycle and changing customer needs and requirements, have pushed firms to reorganize, to revise their businesses strategies and to refocus on their core businesses. In response to these challenges, many firms start to outsource more of their business functions including the logistics ones.**

Logistics outsourcing has become a common practice by many firms, whether they are local or multinational, small or large. And it has attracted attention of both researchers and practitioners.

The aim of this paper is to provide a general overview of logistics outsourcing through presenting the state of the art research in this field, exhibiting the different related concepts and based on that, suggesting future research directions.

***Keywords*—** *Logistics outsourcing, Logistics Services, Logistics Services Provider.*

1. Introduction

In today's highly competitive, extremely variable and really dynamic environment, many firms are seeking solutions in all areas of their activities, also including, or perhaps above all, logistics. One of the business's keys performance, currently, is the major role of the supply chain management in guaranteeing fluid flows of materials and information throughout a firm's supply chain. And as supply chain management becomes more sophisticated and the difference between what firms want to achieve and what they can do in-house continues to grow, firms begin to realize that doing the right thing becomes more interesting than doing everything. Accordingly, they are becoming better focused and more specialized by outsourcing activities that are far from their core businesses.

In recent years there has been a surge of publications in the field of logistics outsourcing which becomes a common phenomenon nowadays. In other words, a firm is to delegate all or part of its logistics activities to a logistics services provider. It is considered as an important factor for competitiveness and flexibility to answer the requirements of new economic challenges. And it is argued that through outsourcing their logistics activities, firms can gain about 9% savings and 15% enhancement in capacity and quality [1].

Despite the growing body of the literature on this topic, efforts to synthesize the state of art of research on logistics outsourcing have been limited, and there is still a lot to be learned [2], because it is growing in importance worldwide [3].

This paper focuses on the main principles of logistics outsourcing, examines, in detail, the logistics services subject of outsourcing, provides a detailed categorization of logistics services providers and finally points out opportunities for future research.

2. Methodology

This paper review is focused on refereed journal papers published within the 1996-2017 period in international journals in logistics, supply chain, supply chain management, operations management, transport, distribution and marketing fields, collected principally from Emerald, ScienceDirect, Inderscience and Jstor. Eventually 41 articles were selected and grouped according to the relevance of the research view.

Table 1 indicates a list of journals in which the 41 articles related to logistics outsourcing were published.

The majority of these articles (26.83%) are published in International Journal of Physical Distribution & Logistics Management, followed by International

Table 1. Distribution of articles by journals in the period of 1996-2017

Journal title	1996-2006	2007-2017	Total	%
International Journal of Physical Distribution & Logistics Management	7	4	11	26,83
International Journal of Logistics Systems and Management	-	2	2	4,88
Supply Chain Management: An International Journal	1	-	1	2,44
Strategic Management Journal	1	-	1	2,44
Logistique & Management	-	2	2	4,88
Transport	-	1	1	2,44
European Journal of Purchasing & Supply Management	1	-	1	2,44
Industrial marketing management	1	-	1	2,44
Management Decision	-	1	1	2,44
International Journal of Operations & Production Management	1	-	1	2,44
International Journal of Logistics Management	1	1	2	4,88
Omega	-	1	1	2,44
International Journal of Production Economics	-	2	2	4,88
Journal of Business Logistics	1	1	2	4,88
Benchmarking: An International Journal	-	1	1	2,44
Asia Pacific Journal of Marketing and Logistics	-	1	1	2,44
Benchmarking for Quality Management & Technology	1	-	1	2,44
International Journal of Business Excellence	-	1	1	2,44
Industrial Management & Data Systems	-	1	1	2,44
Logistics Research	-	1	1	2,44
Journal of Operations Management	-	1	1	2,44
International Journal of Logistics Research and Applications	1	1	2	4,88
Transportation journal	1	-	1	2,44
British Food Journal	-	1	1	2,44
Technovation	1	-	1	2,44
Total	18	23	41	100
%	44	56	100	

Journal of Logistics Systems and Management, Logistique & Management, International Journal of Logistics Management, International Journal of Production Economics, Journal of Business

Logistics and International Journal of Logistics Research and Applications (4.88%), the others journals represent 2.44%. These 41 articles were then classified according to their research nature: empirical vs conceptual. 27 articles (66%) are empirical in nature while conceptual ones are represented in 14 articles (34%) as shown in Figure 1.

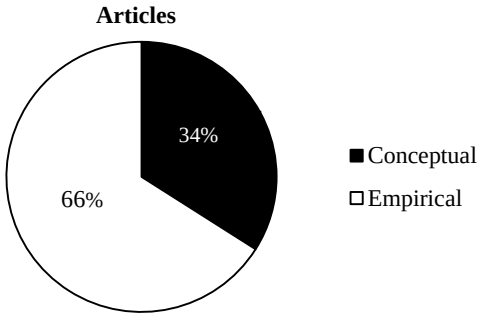

Figure 1. Classification of logistics outsourcing literature in terms of research nature

3. Logistics outsourcing

Based on our investigation, the main different points discussed in the logistics outsourcing literature are: logistics outsourcing drivers, challenges and theories. These latter are the subject of the following section.

3.1 Logistics

Over the past several years, logistics concept has acquired great importance and has been theoretically and practically expanded. It was introduced to fulfill the increasing requirement of an integrated process that manages the materials flows from the source of supply to the point of consumption. This process can be allocated into three parts:

- Inbound logistics: that depicts the movement and storage of materials received from suppliers.
- Materials management: that covers the storage and flows of materials inside the firm.
- Outbound logistics: that describes the movement and storage of finished products from the final production point to the customer.

All these terms and others associated to logistics terminologies are illustrated in Figure 2.

3.2 Logistics outsourcing definition

The perimeter of firms is persistently evolving. Firms are constantly interrogating between the "make or buy", choosing between performing in-house or outsourcing.

Outsourcing in general, according to [4], refers to a firm that contracts with another firm to provide services that could be performed by in-house employees. Sink and Langley (1997) have added that outsourcing is the result of the new business trends that have pushed firms to revise their priorities and focus their resources on a limited number of services including logistics ones.

In fact, much has been written during the last two decades about logistics outsourcing and various terms have emerged to illustrate this phenomenon, such as third-party logistics [1], [5]–[8], contract logistics [1], [6], [8], contract distribution [8], and logistics alliances [8], which generally mean the same thing.

In the literature, several definitions have been proposed to clarify the concept of logistics outsourcing. Sink and Langley (1997) and Millen et al. (1997) for instance, have argued that logistics outsourcing can be defined as the use of external suppliers to perform some or all of a firm's logistics services which have been performed traditionally in-house. This definition is supported by [9], who have appended that logistics outsourcing has become an increasingly powerful trend in modern firms due to the significant number of benefits it brings.

Although there is no doubt about the rising importance of logistics outsourcing in business practices, a variety of drivers and challenges of this development have been identified in research.

3.3 Logistics outsourcing drivers

There are several drivers reported in the literature like motivations to why firms outsource their logistics services, such as reducing costs [1], [10]–[17] (due to economies of scale resulting from higher volumes obtained), focusing on core business [1], [4], [9]–[11], [18], [19] (by giving more importance to services that the firm masters and getting rid of those that do not represent competitive advantages), improving customer services [11], [12], [14], [15], [17], [20] (in terms of reduced customer lead-time and higher quality of services), increasing flexibility [11], [14], [15], [20] (logistics services providers, through their expertise, are able to deal with variations in demand), sharing risks [4], exploiting external resources [18] and globalization [6], [12]. These are some of the drivers that have contributed to changes in the logistics landscape and have forced

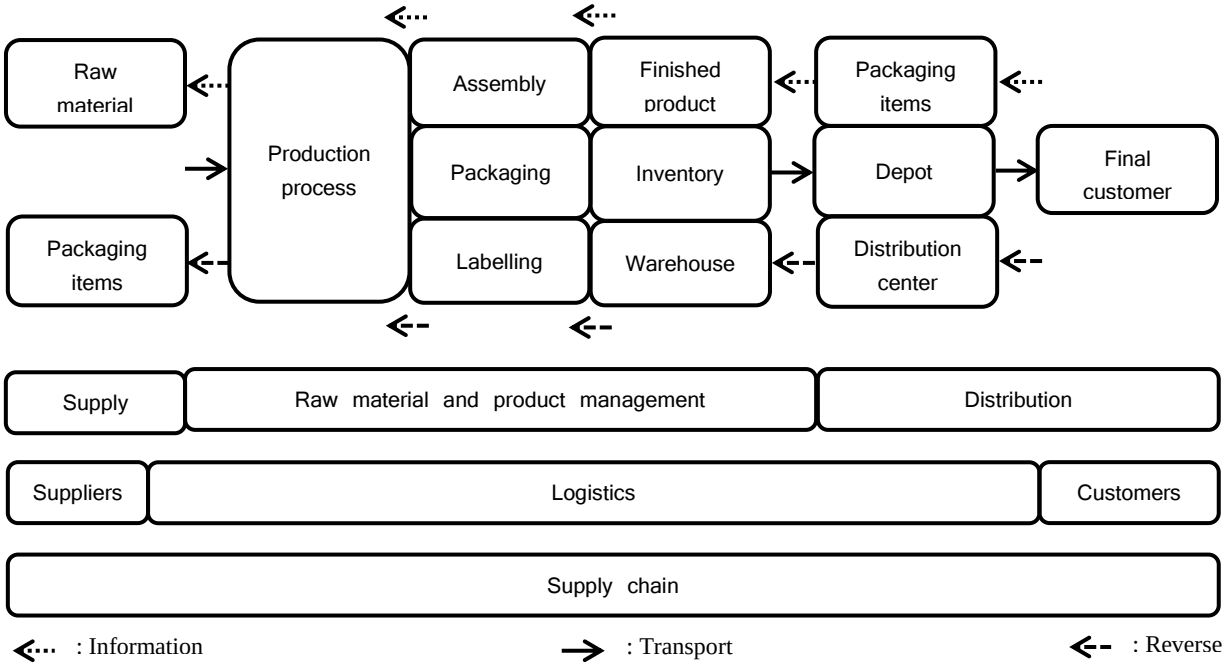

Figure 2. Logistics flows and terminologies adapted from [21]

more firms to become interested in outsourcing various elements of their supply chain to logistics services providers.

Many other authors have discussed and studied this point by means of surveys in which logistics managers of user firms were asked about the drivers for outsourcing their logistics services. Table 2 summarizes the findings of six previous studies on the issue.

The findings of the six studies indicate that the drivers motivating logistics outsourcing are numerous and can be distinguished according to their operational or strategic nature. These drivers converge with regard to the willingness of firms outsourcing their logistics services to restructure their global supply chain to answer the question of focusing on their core business. In other words, firms, nowadays, are often unable to satisfy the technical and functional requirements of logistics that has become too complex, they need support to improve the coordination of their operations, to cope with fluctuations in volumes, to obtain lower costs and to increase the quality of services or to customize their products in relation to market expectations. They also took into account the fact that their success no longer depends on them alone but on a network of partners able to offer them new skills and technologies.

3.4 Logistics outsourcing challenges

When outsourcing logistics services, firms can enjoy many advantages but also have to be aware of the associated challenges. The most frequently logistics outsourcing challenges cited in the literature are the following: failure to select or change logistics services providers [6], loss of control [6], [8], [17], [25]–[27], loss of customer feedback or contact [8], [17], dependency [25], poor services performance [17], poor coordination efforts [17], poor information sharing [17], risk of losing expertise [26] and risk of exchanging confidential data [6], [26], [27].

Min (2013) has enumerated the logistics outsourcing challenges respecting the outsourcing process. These challenges may include the following: the identification of logistics services that need to be outsourced, the continual evaluation of logistics services providers' performances, the coordination of outsourced logistics services through regular communication with selected logistics services providers, the preparation of a request for proposal (RFP) or request for quotes (RFQ), the contract renewals and the establishment of a long-term relationship with trustworthy logistics services providers.

In the same context, [20] through their survey conducted in 2010, have suggested a classification of the challenges that the decision of outsourcing logistics services may lead into four majors

ones: the lack of logistics services provider's capabilities to meet a firm's requirements, the incompatibility of a firm's and a logistics services provider's IT systems, the failure of a logistics services provider to meet the firm's future growth needs and the logistics services provider's lack of control and security.

Table 2. A summary of six previous studies on logistics outsourcing drivers

Drivers	Identified by (Year)
Reduce logistics costs (58), increase flexibility (56), improve service levels for the outsourced functions (52), focus on core competencies (38), reduce capital expenditures for logistics (31), availability of greater specialized expertise (27), improve the use of information technology (20)	Sink and Langley (1997)
Cost reduction (69), service improvement (61), strategic flexibility (57), focus on core competencies (53), change implementation (31)	Van Laarhoven *et al.* (2000)
Competencies of LSP (56), cost reduction (54), operational flexibility (54), focus on core business (50), avoiding investment (38), expansion to new markets (18), labour considerations (6)	Wilding and Juriado (2004)
Focus on core competencies (69), success of firms using 3PL services (68), logistics cost reduction (62), improved customer services (50), improve return of assets (42), increase inventory turn (36), productivity improvements (36), develop supply chain partnerships (23), access to emerging technology (21), imbibe more flexibility in operations (17), access to unfamiliar market (11), diverting capital investment (7), corporate restructuring (4)	Sahay and Mohan (2006)
Cost reduction (78), reduction in capital investment (70), enhance operational flexibility (60), access to new technology (54), access to expertise (52), access to new market (48), focus on core business (46)	Rahman (2011)
Focus on core competencies (91), improve process responsiveness (91), improve customer service (91), improve conformance quality (91), improve process capability and cycle time (91), reduce logistics costs (91), improve process lead time (89), increase supply chain flexibility (89)	Rajesh *et al.* (2013)

Note: Figures in parentheses are percentages that refer to the share of firms outsourcing their logistics services according to the drivers identified by the six studies.

3.5 Logistics outsourcing theories

Logistics outsourcing or in-house decision has been studied from different angles due to its multidisciplinary nature. Three theories are generally discussed in the literature:

- Transaction Cost Economics (TCE).
- Resource-Based Theory (RBT).
- Network Theory (NT).

3.5.1 Transaction Cost Economics

TCE reports that a firm's decision to outsource its logistics services is founded on minimizing the sum of its transaction and production costs. The principle of this theory is that outsourcing to a logistics services provider will take place when there is a possibility to reduce transaction costs. This principle was explained by [28], who have mentioned that if transaction costs are low, the

activity should be purchased in the market (outsourced) and if they are high, the activity would be internalized (managed in-house).

The actions of a firm to reorganize its process to outsource more services to a logistics services provider and stay competitive cannot be explained by TCE alone. The decision of outsourcing logistics services engages outside firms to carry out other organizational operations which leads to the Resource-Based Theory (RBT).

3.5.2 Resource-Based Theory

RBT points out that a firm can be seen as a set of resources which are heterogeneously distributed across firms, with differences between them that last over time [29]. The term ‘‘resources’’ has a broad meaning, in this context it refers to not only tangible assets, such as materials, warehouses, equipment and plants but also to intangible assets, such as knowledge, know-how and organizational assets. The principle of this theory suggests that a firm has to insure an efficient flow of the right type of resources from its environment in order to survive and enhance its performance [30].

According to [31], all logistics services can be outsourced, enabling the firm to access to a wide range of resources it does not possess, to maintain competitiveness in the marketplace and to get access to complementary resources. However, the fact of having access to complementary resources does not fully explain the reason why firms outsource their logistics services to logistics services providers which leads to the Network Theory (NT).

3.5.3 Network Theory

NT emphasizes that outsourcing permits the firm to manage its supply chain as a single entity through the application of relationship building and network coordination. This view supposes that it is necessary for firms to exchange resources [32]. The principle of this theory is that a firm needs resources that are often controlled and managed by other firms, and these resources can be procured only by making relationships and interacting with these firms.

NT provides an explanation for the growth of logistics outsourcing and focuses on the formation of relationships and alliances between firms. Within this theory perspective, a firm that has the ability to coordinate well with other firms in the network can create for itself a basis for reaching a competitive advantage, which provides another theoretical motivation or driver for the need for logistics services providers.

We have provided an overview on logistics outsourcing from the view of the three theories: TCE, RBT and NT. Each theory provides its own perspective with regard to the factors that influence the major place of the logistics outsourcing in the supply chain. Although each of these three theories provides different views on the role of the logistics outsourcing in the supply chain, none of them is wholly sufficient by itself to provide a complete explanation. Rather, the three theories are complementary to one another and in a body, they provide full support for logistics outsourcing. Figure 3 summarizes the essential of these three theories.

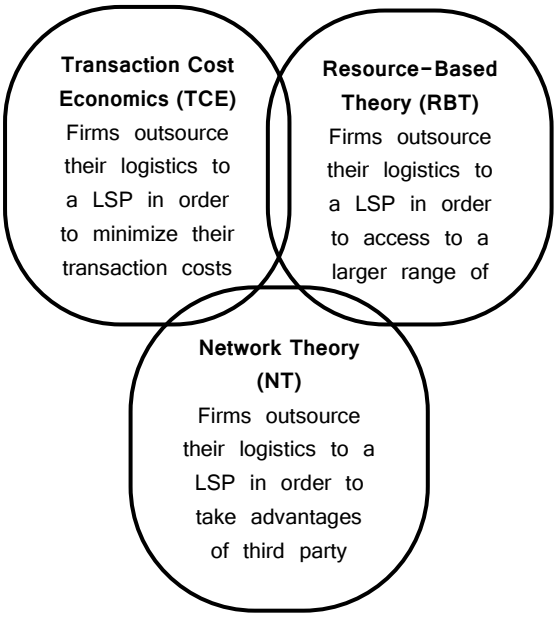

Figure 3. Logistics outsourcing theories adapted from [13]

4. Logistics services

Today there is a renewed interest for the logistics services field. The main reasons for this situation are the steady growth of the logistics services market and the vital importance of logistics services providers in the supply chain. But before detailing this concept, it proves important to start, first, with a brief overview of the notion of “service”.

A service, in general, can be defined as an action performed to satisfy a requirement or to fulfill a demand. It is about incorporeal products such as accounting, insurance, consultancy, expertise or transportation. And as reported by [33], a service is different from a good from the fact that it is: intangible (because it is a performance rather than an object and no transfer of possession or ownership takes place when it is sold), inseparable (because its production and its consumption take place simultaneously. In other words, a service is consumed during its production and that's what we call the "servuction"), heterogeneous (because its performance often varies from supplier to supplier, from customer to customer and from day to day) and perishable (because it cannot be stored).

All these characteristics remain valid for logistics services which are numerous and which cover all the supply chain's links. Therewith, it is important to classify logistics services for outsourcing research. In fact, in recent years, logistics services have attracted much attention from research teams and various classifications have been presented in the literature.

Hsiao et al. (2009, 2010) for example, have classified logistics services into four levels, making the distinction between execution and planning and control services in operations management:

- Level 1: it refers to transportation and warehousing services.
- Level 2: it refers to value-added services like packaging and labeling.
- Level 3: it refers to planning and control services, such as inventory management and transportation management.
- Level 4: it refers to distribution network management services.

Whereas, for [25], [36] there are just three types of logistics services depending on the needs and requirements of firms: basic services, customized or value-added services and advanced or strategic services.

There is another classification proposed by [37], where they have distinguished two types of logistics services: basic logistics services and advanced logistics services (See Figure 4 for more details). This classification was adopted and confirmed as well by [11] who have grouped the three types of logistics services given by [25], [36] into two ones. Actually, they have integrated the second type (customized or value-added services) into the concept of advanced services as suggested by [37]. The same idea was applied to the classification proposed by [34], [35], in which the first and the second level can be covered by the concept of basic logistics services, and the other levels can belong to advanced services, as proposed by [37].

To date, the research has largely tried to answer the question of "why" firms outsource their logistics, but gaps subsist concerning the question of "what" they outsource. The literature provides almost no guidelines on which operations can be outsourced. Therefore, the question of "what to outsource" remains one of the key questions in research.

In fact, from the original classic vision that focused on the outsourcing of transport and warehousing services, today we have moved to a vision that puts a great emphasis on outsourcing. However, it can be observed that the traditionally outsourced services, such as transport and warehousing, remain by far the main services of logistics services providers, even if they increasingly integrate other services into their offers.

The logistics services that can be outsourced are obviously numerous and range from execution activities, such as transportation, to planning activities, such as transportation planning [35].

According to [1], logistics services that can be outsourced are: warehouse management, shipment consolidation, fleet management, order fulfillment, product returns, carrier selection, logistics information systems, rate negotiation, product assembly, order processing, inventory replenishment, order picking, inbound and outbound transportation, labelling and packaging, distribution, custom clearance and forwarding, import and export management and customer services.

And for [38], the most outsourced logistics services are: transportation, packaging, transportation management, inventory management and distribution network design.

So as to have a clear and deeper idea about the frequently outsourced logistics services by manufacturers, we have analyzed twelve previous studies on the issue. The chosen studies date from 1997 to 2016 in order to identify trends in the chronological progression of outsourcing of logistics services over time.

Accordingly, we have decomposed logistics services into three categories:

- Category 1: it refers to basic logistics services.
- Category 2: it refers to value-added logistics services.
- Category 3: it refers to advanced logistics services.

Table 3 summarizes the findings of these twelve studies.

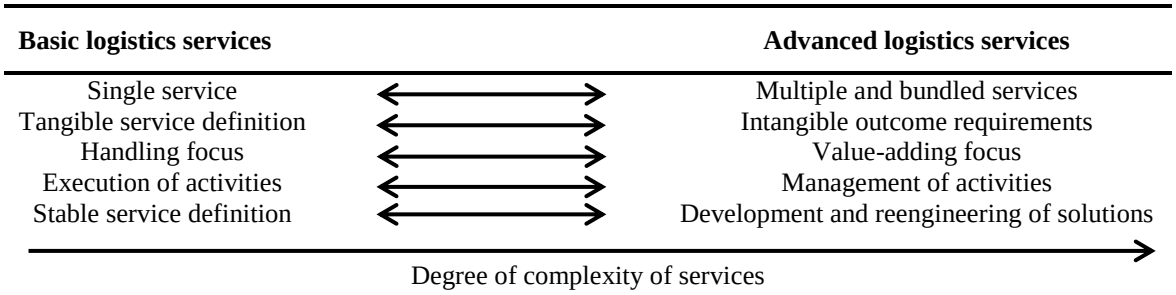

Figure 4. Logistics services classification adapted from [37]

Table 3. A summary of twelve previous studies on logistics services

Category of logistics services	Rahman (2011)	Min (2013)	Bakar and Jaafar (2016)
Basic logistics services	Fleet management (41) Shipment consolidation (27)	Customs clearance (60) Port services (56) Freight forwarding (45) Shipment management (40) Shipment consolidation (34) Freight brokering (33) Inbound traffic control (20) Outbound traffic control (16)	Freight forwarding (69) International transportation (68) Domestic transportation (56) Warehousing (23)
Value-added logistics services	Order fulfillment (59) Order processing (27) Product returns (27) Product assembly / installation (9)	Freight bill payment (47) Import / export documentation (40) Product packaging / labeling / marking (16) Returned good (14)	Reverse logistics (40) Invoicing (21) Order processing (21) Value-added services (17)
Advanced logistics services	Warehouse management (64) Carrier selection (23)	Security management (24) E-logistics (19) Returned good management (14) Warehouse management (14) Carrier negotiation and contracting (11) Inventory management (11)	Inventory management (15) Logistics IT system (15)

Note: Figures in parentheses are percentages that refer to the share of firms outsourcing these logistics services as identified by the twelve studies. (Continued)

Category of logistics services	Sohail and Sohal (2003)	Hong *et al.* (2004)	Sadiq Sohail and Saad Al Abdali (2005)	Sahay and Mohan (2006)	Ansari and Modarress (2010)
Basic logistics services	Shipment consolidation (58) Fleet operations (49)	Freight forwarding (61) Transportation (44) Warehousing (38) Distribution (26)	Shipment consolidation (28)	Outbound transportation (56) Inbound transportation (52) Custom clearing and warding (51) Outbound warehousing (34) Consolidation (29) Fleet management (29) Inbound warehousing (29) Distribution (23) Outbound traffic control (16)	Inbound freight (86) Outbound freight (74) Customs brokerage (68) Freight consolidation (58)
Value-added logistics services	Freight payment (42) Order fulfillment (30) Product returns (20) Order processing (15) Product assembly / installation (11)	Value-added services (11)	Freight payment (19) Order fulfillment (17) Product assembly / installation (15)	Labelling and packaging (29) Order picking (27) Reverse logistics (22) Order fulfillment (20) Order processing (19) Assembly / installation (13)	Freight bill payment (43)
Advanced logistics services	Carrier selection (39) Rate negotiation (37) Warehouse management (33) Inventory replenishment (24) Logistics information systems (21)	Logistics information systems (14) Logistics system design (11)	Carrier selection (33) Inventory replenishment (14) Information systems (10)	Import / export management (34) Inventory management (23) Rate negotiation (22) Selected manufacturing (16) Inventory management (11) Demand forecasting / planning (3)	Warehousing management (65) IT logistics (62) Consulting (37) Global logistics (28)

Note: Figures in parentheses are percentages that refer to the share of firms outsourcing these logistics services as identified by the twelve studies. (Continued)

Category of logistics services	Millen *et al.* (1997)	Boyson *et al.* (1999)	Van Laarhoven *et al.* (2000)	Larson and Gammelgaard (2001)
Basic logistics services	Fleet management (53) Shipment consolidation (42)	Warehouse operations (29) Fleet management (17)	Storage (87) Line haul (81) Emergency transport (70) Network based transport (70) Tracking and tracing (64) Merge-in-transit (36) Inbound warehousing (29) Distribution (23) Outbound traffic control (16)	Outbound transportation (82) Warehousing (72) Logistics planning (64) Inbound transportation (62) Shipment consolidation (62) Track and trace (44) Fleet management (42)
Value-added logistics services	Order fulfilment (33) Product returns (33) Order processing (16) Product assembly & installation (13) Freight payment (9)	Freight payment (57) Packaging (15) Product returns (15) Order processing and fulfilment (10)	Order picking (79) Inventory administration (64) Labelling (52) Customisation (26) Assembly (19) Invoicing(18) Order entry (11)	Customs clearance and duty processing (61) Pick and pack (59) Labelling/Packaging (51) Returns/Reverse logistics (51) Order processing (47) Invoicing (46) Payment processing (31) Assembly (23) Cross-docking (21)
Advanced logistics services	Warehouse management (47) Carrier selection (27) Logistics information systems (22) Inventory replenishment(13) Rate negotiation(11)	Carrier selection (24) Rate negotiation(24) Information systems (20) Shipment planning (17) Inventory management (8) All supply chain functions (10)	Forecasting (2)	Inventory management (61) EDI (56) Web-based linking (56) Inspection/Quality control (39) Information systems management (33) Management reports (33) Supply chain design (29)

Note: Figures in parentheses are percentages that refer to the share of firms outsourcing these logistics services as identified by the twelve studies.

The following conclusions can be drawn from Table 3:

- Logistics services have diversified over the time.
- All the twelve studies indicate that basic logistics services are the most outsourced, because many firms still prefer to keep most of the logistics process in-house and outsource only the most basic services of warehousing and transport to logistics services providers.
- Advanced logistics services have a low priority in outsourcing, despite the large-scale investments made by logistics services providers in information technologies.
- Almost all logistics services can be outsourced, because for each logistics service that researchers have embodied in their surveys, there has always been at least one firm outsourcing that service.

5. Logistics services provider

For reasons of rationalization of practices and with a view to focus on core business, firms tend to outsource their logistics services. This massive use of logistics services outsourcing has led to the emergence of a new actor, the logistics services provider which now occupies a central place in the supply chain and has begun to diversify his offers, ranging from conducting operations to piloting the whole supply chain.

The term logistics services provider is applied as a synonym for similar terms such as outsourcer, carrier, forwarding firm, transport firm, logistics services firm and third-party logistics provider [40]. And it has been defined in numerous ways in the literature. Hertz and Alfredsson (2003), for example, have stated that a logistics services provider (the outsourcer) is an external provider who manages, controls, and carries out logistics services on behalf of a firm (the service user). For [5], a logistics services provider is a service provider who is able to assume some or all of a firm's logistics services. And [14], in his definition, has added a very important point which is the added value provided by the logistics services provider to a firm's business.

In fact, the logistics services provider should not be considered as an additional intermediary but he needs to be treated as a separate industry [16]. Actually, many authors, in the literature have supported this vision. Roveillo et al. (2012), for instance, have looked at the logistics services provider as a "logistics integrator", because his presence is of paramount importance throughout the firm's supply chain (from the first supplier to the final customer), also because he is actively involved in managing the interfaces between its various components. For [13], a logistics services provider has been seen as an "orchestrator". The term "orchestration", in this context, signifies the activity of managing and coordinating to facilitate the supply chain management best practices.

Thus, the evolution of the definitions has followed the evolution of the services that the logistics services providers offer in order to succeed within a very competitive marketplace [21]. Logistics services providers, nowadays, strive to become large in size with the ability to offer advanced logistics solutions. And the literature has conceptualized these developments by distinguishing different types of logistics services providers based on their ability to adapt their services to their customers and their ability to solve the logistics problems they face.

EJ (1993) peeps out to be the first to suggest two basic types of logistics services providers: operations-based third party logistics vendors and information-based third party logistics vendors. Later, the same author has modified this classification by suggesting the following four types of vendors (logistics services providers):

- Asset-based vendors: they refer to firms which provide physical logistics services through the use of their own assets. It is generally about a trucks fleet or a group of warehouses or both.
- Management-based vendors: they refer to firms which are involved in providing logistics management services through databases systems and services consulting. These firms do not own transportation or warehouse assets.
- Integrated vendors: they refer to firms that own assets, typically trucks, warehouses or a combination of both. However, they are not limited to the use of their own assets and will contract with other logistics services providers if required.
- Administration-based vendors: they refer to firms which mainly provide administrative management services such as freight payment.

This classification has been, in part, adopted by [44]. These latter have allocated logistics services providers into two categories: asset-based logistics services providers and non-asset-based logistics services providers. And [45] have suggested a classification closer to that suggested by [43]. In fact, they have distinguished three types of logistics services providers:

- Classical logistics services providers: they carry out physical operations related to the

transport, handling, warehousing and storage of intermediate or finished products of their customers.

- Value-added logistics services providers: they include the management of industrial or commercial operations (for example delayed differentiation), administrative operations (for example invoicing) and informational operations (for example tracking and tracing of products).
- Dematerialized logistics services providers: they have no physical resources and they build their services by mobilizing resources from specialized subcontractors and ensuring their overall coherence through a total control of information flows.

There is another classification given by [41], where they have distinguished between four types of logistics services providers:

- Standard logistics services providers: they perform the most basic operations of logistics such as picking, warehousing and distribution.
- Service developers: they provide advanced value-added services to their customers such as tracking and tracing, cross docking and specific packaging.
- Customer adapters: they offer services at the request of the customer. They improve logistics services and do not develop new ones.
- Customer developers: they are the highest level of logistics services providers. They integrate themselves with customers and take over entire logistics functions.

Conventionally, the lexicon of logistics terms proposes distinguishing the five main families of logistics services providers (1PL, 2PL, 3PL, 4PL and 5PL) present on the market, according to the complexity of their system of offer:

- First Party Logistics (1PL):

This term is used for those manufacturers that carry out their logistics by themselves. They own all logistics assets and manage all their logistics operations in-house as shown in Figure 5.

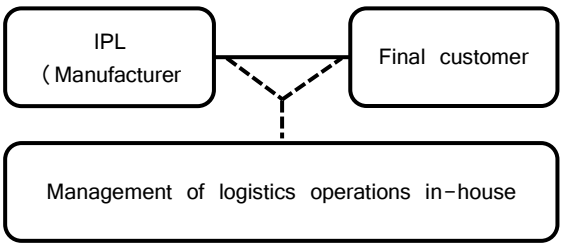

Figure 5. Schematization of the role of First Party Logistics

- Second Party Logistics (2PL):

When manufacturers began to extend their business geographically, it became tough for them to manage all the logistics operations by own. Then the concept of Second Party Logistics (2PL) came in the market. These 2PL manage the simple execution of physical operations related to transport [45], and consequently they offer a single function in the supply chain as depicted in Figure 6.

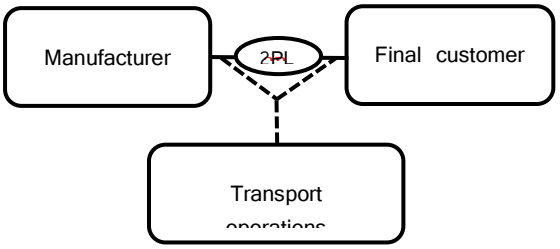

Figure 6. Schematization of the role of Second Party Logistics

- Third Party Logistics (3PL):

Thereafter, the 2PL develop their capabilities in handling logistics functions and also integrate different services provided before separately, which leads to the emergence of a new family of logistics services providers which is the Third Party Logistics (3PL). These 3PL can provide in addition to transport and warehousing, value-added operations such as cross-docking and delayed differentiation as indicated in Figure 7.

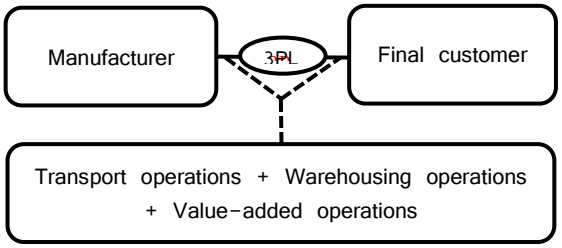

Figure 7. Schematization of the role of Third Party Logistics

- Fourth Party Logistics (4PL):

Fourth Party Logistics (4PL) is the next evolution of logistics services providers and it was developed on the basis of 3PL. 4PLs differ from the other providers (1PL, 2PL and 3PL) in the sense that they have no tangible assets. They have no physical means (trucks or warehouses) and their role is similar to that of logistics consultants who provide engineering services. The concept of 4PL should

not be confused with that of LLP (Lead Logistics Provider). Actually, the two providers offer the same logistics services but the existing difference lies in the means used. A 4PL, as we have seen, is a non-assets provider, whereas a LLP is a mixed-assets provider because he carries out his customers logistics services by using his own resources and those of other LSPs.

In the literature, a 4PL can be seen as a "transaction center" [46], as a "supply chain integrator" [32], [47], as a "business process outsourcing (BPO) provider" [48] and as a "coordinator" [21] by dint of his ability to manage the resources of its own organization with those of complementary logistics services providers as can be seen in Figure 8.

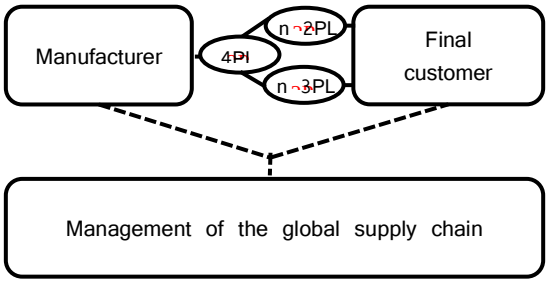

Figure 8. Schematization of the role of Fourth Party Logistics

This term of 4PL was filed by the consulting cabinet Accenture as a registered trademark in 1996. And the definition given at the time was as follows: *«the 4PL is an integrator that assembles its own resources, capabilities and technology and those of other service providers to design and manage complex supply chain »*.

And in 2000, the same cabinet proposed a segmentation of the action of 4PL in three operations and his position in relation to other providers. This is illustrated in Figure 9.

From the figure below it can be deduced that a 4PL can play three different roles depending on his relationship with his customers and other providers:

- Synergy Plus: in this role, the 4PL is placed alongside one or more logistics services providers (2PL and 3PL) towards several customers. It is about cooperation between the other logistics services providers and the 4PL, in a relationship that allows taking advantage of the resources and competencies of each one.
- Solution Integrator: in this role, the 4PL is considered as a solution integrator, because he can manage and build an integrated supply chain with many other logistics services providers (2PL and 3PL) towards a single customer.
- Industry Innovator: in this role, the 4PL synchronizes a group of customers in order to bring the supply chain to high efficiency, thanks to technologies and operational strategies.

Referring to the definitions presented previously, we can deduce that a 4PL is a response to the multiplication of actors in the supply chain. He designs both the logistics architecture and the information system applying to the firm's integrated processes. However, he does not execute in person the corresponding physical flows, which are entrusted to other logistics services providers. His principal mission is to coordinate the network of partners of the integrated firm (suppliers, distributors, customers, 2PL, 3PL, etc.) as illustrated in Figure 10.

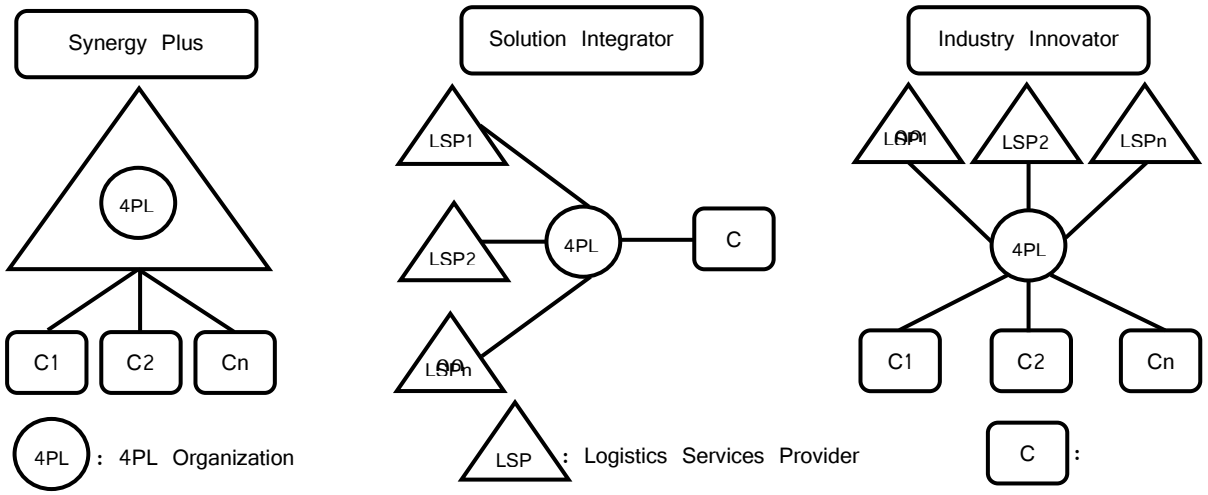

Figure 9. The three roles of a Fourth Party Logistics adapted from Accenture

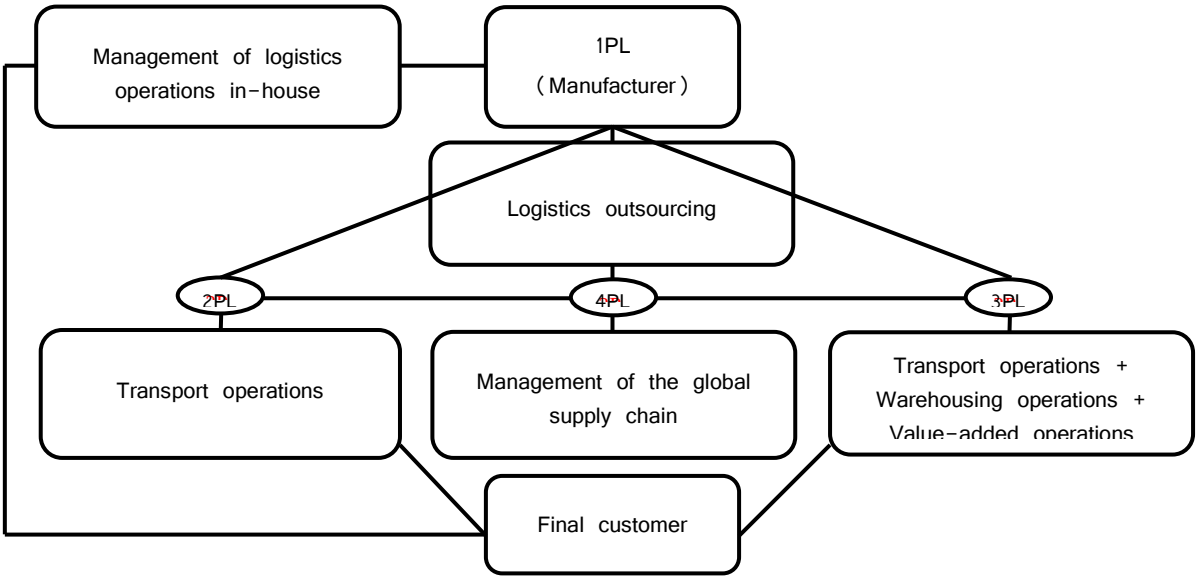

Figure 10. Schematization of the links between the different types of LSPs

- Fifth Party Logistics (5PL):

The fifth and the final family of logistics services providers is the Fifth Party Logistics (5PL). 5PL is a new concept in logistics outsourcing and it is about the management of all parties of the supply chain in conjunction with e-business. Other terms in the literature are used to depict this family of logistics services providers, such as "virtual logistics services provider" and "info-mediary". The major focus of a 5PL is to offer automated and intelligent systems able to improve the performance of the supply chain and the key of success of this emerged family is the integration of information technologies and computer systems. Like the 4PL, a 5PL is almost wholly virtual. He possesses no typical assets, he has no physical presence but he forms a web-based system that provides information to the range of participants under his control [25].

The logistics services providers' families present in the literature demonstrate the extent of the skills of the actors in this sector and the variety of situations encountered. While logistics services providers are primarily regarded as "subcontractors" in a first phase, they became, in a later stage, "co-designers" and even "designers" and "managers" of the supply chain, in an innovative and creative approach. Figure 11 gives a summary of these main logistics services providers' families.

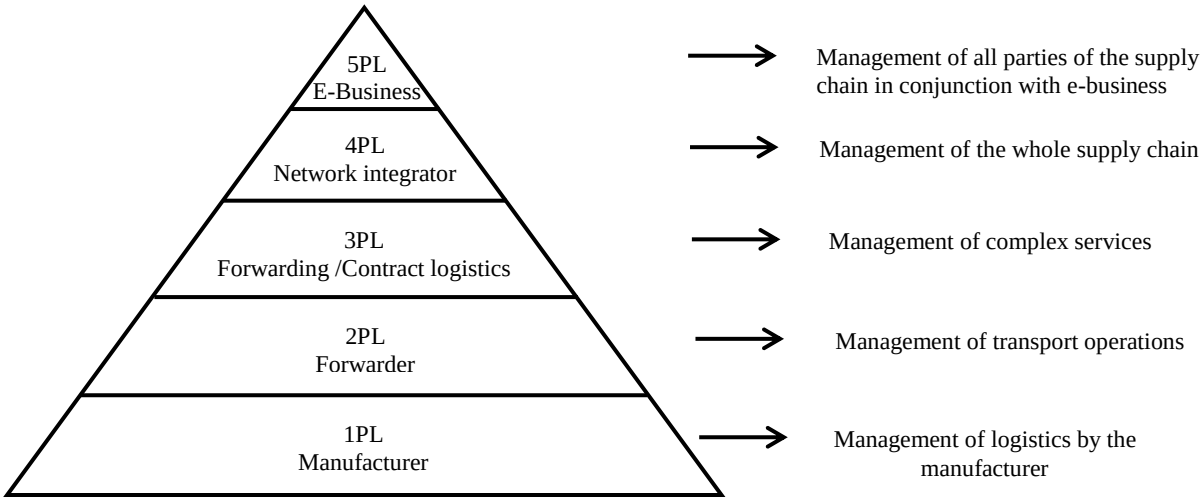

Figure 11. A summary of the main logistics services providers' families

6. Conclusion and future research

In this paper, 41 articles on logistics outsourcing, published in the period of 1996-2017, are analyzed in depth to identify the main related concepts in the literature: logistics outsourcing drivers, challenges and theories, logistics services and logistics services providers.

Thus, based on the present review, classification and analysis of the articles, some suggestions for future research can be taken into account. Indeed, despite the considerable development achieved over the last two decades, there still exist many important issues for future investigation. Without claiming to be exhaustive, some suggestions are identified in the following:

- The majority analyzed articles (66%) are empirical in nature and are generally related to a specific region or country. Moreover, we have noticed a total absence of studies in the Moroccan context, whether within firms or logistics services providers. Therefore, it would be interesting to do more studies in this respect in order to have an idea about the status of logistics outsourcing in Morocco.
- Only 34% of the analyzed articles are conceptual in nature which confirms that literature on logistics outsourcing is weakly theorized. So, it could be beneficial to focus more on the production of theoretical articles so as to further enrich this area of research.
- More than half of the studies conducted on logistics outsourcing are based on firms and they neglect the unavoidable actor of this operation which is the logistics services provider. Thus, more attention should be given to this axis to develop a deeper understanding of the complexities that appear through the interactions between a logistics services provider and his customers.

Finally, this paper may support researchers to understand the insufficiency in the logistics outsourcing literature and to find the gaps for work to be accomplished in the future.

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