

MATURITY OF THE SUPPLY CHAIN AND ARBITRATION BETWEEN THE INTERNALIZATION AND OUTSOURCING OF LOGISTIC ACTIVITIES

Mohammed Amine Balambo (PhD)

Professor, University Ibn Tofail, Kenitra, Maroc

Amr MIR

PhD Scholar, University Ibn Tofail, Kenitra, Maroc

Received: 14-March-2017, Accepted: 15-April-2017

Abstract

This article attempts to analyze the arbitration between internalization and outsourcing of logistics activities. The objective is to formulate research proposals allowing us to illustrate the influence of the degree of maturity of the supply chain on the practices of internalization and outsourcing logistic activities.

Keywords: Internalization, Outsourcing, logistics activities, Integration, maturity of the supply chain, Logistics Service Providers

Introduction

The logistics concept is complex, in the context of small and medium-sized companies operating in less mature sectors, logistics is perceived as a strictly operational activity, aiming at the optimization of disjoint functions such as procurement, transport, storage, Production, distribution, etc. On the other hand, in other mature sectors, logistics is perceived as a management philosophy aimed at optimizing and integrating flows between several actors with common challenges. Colin (2005) Defines logistics as "*an approach to the management and management of physical goods flows through associated virtual flows of information*". Logistics provides adequate responses to new challenges in competitive markets (cost reduction, agility, downstream management, flow synchronization, traceability, etc.). By becoming a discipline and a management mode in its own right, the players in the supply chain are developing new logistical strategies based on new organizational configurations. This new approach leads players to rethink and integrate their organizations to achieve better performance. Our article tries to highlight that the outsourcing of logistics activities is a practice allowing the integration of organizations able to achieve high levels of performance. Nevertheless, we assume that only companies that are part of the mature supply chain are able to outsource their logistics activities. On the other hand, companies related to immature supply chain internalize their logistics activities.

Theoretical Understanding of the Maturity of Supply Chain: The outsourcing of logistics activities has led to the creation of new players integrating supply chain "*The emergence of logistics service providers can be explained in particular by the disengagement of industrialists and distributors, activities deemed peripheral and a refocusing on their Core activities, activities deemed essential*" (Paché and Sauvage, 2004). Research on the technologically advanced logistics service providers (Marasco, 2007, Maloni and Carter, 2006, Fabbe-Costes and Roussat, 2011) show that logistics service providers are real integrators of supply chain on behalf of their shippers, they take care of the assembly of resources and capacities and the integration of information flows to finally build an integrated logistics supply system. Fabbe-Costes (2007) advocates the integration of four interdependent layers, Flow, process, information system and actors. In addition, it is clear that the supply chains in the different sectors do not deploy all good practices in terms of integration and information sharing.

Some sectors are characterized by integrated and mature supply chain, while others are characterized by disintegrated and immature supply chain. This leads us to differentiate the supply chain according to their degree of logistic maturity. Salomon (2003) illustrates the correlation between logistic maturity and logistics integration. It must be noted that the outsourcing of logistics activities to logistics service providers implies first of all a mastery of the internal and external supply chain. Colin (2005) characterizes a first level of logistics maturity (Traditional Enterprise)

as an organization looking for multiple local optimizations disjoint given the fragmented nature of logistics by deploying operational research techniques. This mode of immature management has of course revealed limits that lie in the absence of a global vision capable of generating profits by making coordination between functions rather than considering them as silos.

According to the same author, the internal supply chain marks the compromises between the functions of the company, these aim at the search for a global optimization instead of a partial optimization, the logistic coordination imposes the functions of dismantling the silos, Interact and interact to achieve greater flexibility and improved performance. As for the external integrated supply chain, it extends beyond the company's internal borders and provides advantages related to the coordination and integration of upstream and downstream by proposing the management of all Logistics system. It is at this level that companies entrust their logistical activities to providers who play an important role in integrating the upstream and downstream of a supply chain. In our research, the arbitration between internalization and the outsourcing of logistic activities depends on the level of maturity of the supply chain. We have studied a literature review based on two important layers contributing to integration supply chain and consequently to the improvement of the maturity of the supply chains.

Logistical Processes and Arbitration Between the Internalization and Outsourcing of Logistic Activities: The first layer concerns logistical processes, Lambert et al. (1998) highlight the importance of logistics processes and thus define the supply chain as "a need at all levels for integration of activities and processes with and between organizations that extend Beyond logistics". Through this definition, we understand that the movement of physical flows from upstream to downstream implies coordination between logistic actors through the implementation of integrated logistics processes and activities. According to Lambert et al (2000), supply chain management is defined as "the integration of key business processes linking the end customer to the originating provider that provides products, services and information that can contribute to the creation of added value for consumers and other stakeholders".

The AFNOR X-50-600 standard also provides a process-oriented definition "the logistics approach is global, it applies to the whole supply chain. It is part of the company's strategy and allows, through rigorous management of the interfaces, to transform a succession of operations into an integrated global process".

Given the different definitions cited above, it should be made clear that logistical processes are among the most important contributors to the integration of the supply chain. Stevens (1989) reports that the integration of the external supply chain is preceded by the integration of the internal supply chain. The process approach focused primarily on the internal operations of the company. Integration of the external logistics chain leads to a redeployment of the process approach not to an intra-organizational level but to an inter-organizational level. The main processes of a logistical chain allowing the inter-organizational integration between several actors were identified in the framework of the work with the GSCF.

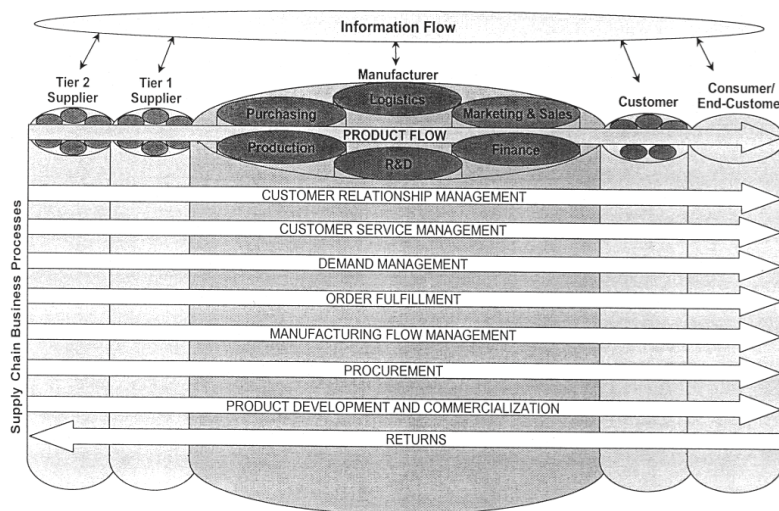


Figure 01: Integrating processes through the supply chain (Lambert and Cooper 2000)

In view of these definitions, it should be made clear that logistical processes are part of the most important dimensions contributing to the integration and improvement of the maturity of supply chains. As part of an outsourcing of logistic activities, it is often a question of entrusting standard logistic activities. In order to identify these activities, it would be necessary to identify the logistical processes in advance. To do this, much research has been modeled on the SCOR model.

The SCOR model is currently used to refer to multiple industrial, commercial and service sectors in the world (aeronautics, chemicals, food, electronics, retail, etc.) to assess their logistical maturity and implement best practices. Because of its complete structure, this model has become a de facto standard on the market by allowing to structure the actors of the supply chain around a standard language.

Thus, SCOR identifies four levels of logistical processes:

- Level 01 is strategic, it is similar to logistics processes, this level defines the framework and the content of the model, here are defined the bases of the objectives of performance to be reached
- Level 02 is tactical, it refers to sub-processes allowing the configuration of the supply chain, this level reflects the strategy adopted by the company for carrying out its operations
- Level 03 is operational, it defines the company's ability to compete in its market and consists in: (1) defining activities (2) providing input / output information of activities (3) providing best practices
- Level 04 involves performing elementary tasks, companies implement specific managerial practices at this level to achieve a competitive advantage and adapt to changing conditions.

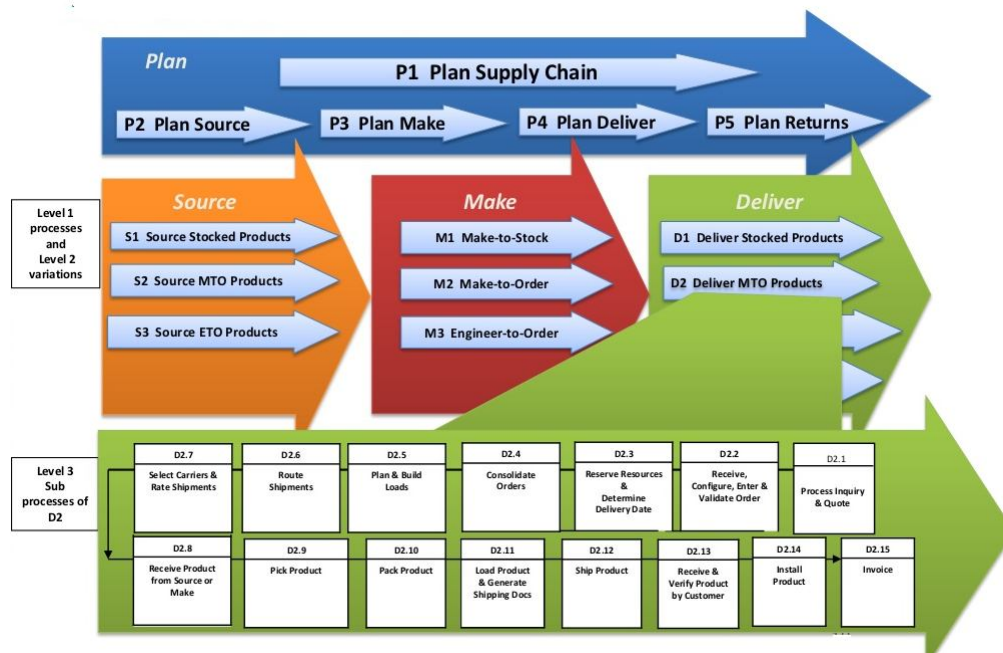


Figure 02: SCOR model, level 01, 02 and 03 (SCOR Overview, 10.0)

Outsourcing involves the last three levels, a company can outsource an entire sub-process, one or more logistic activities attached to the sub-processes, or even only intrinsic tasks to logistic activities, not modeled at the SCOR model level. Left to the care of the companies to adapt them as best as possible to their managerial practices and their sectors of activity. If we focus on the distribution process, we invented fifteen (15) logistic activities that have taken place from the receipt of the order to the shipment, through the logistics of upstream and downstream transport, Storage, order preparation, delivery, etc. In this perspective, the integration of intra-organizational and inter-organizational logistics processes raises the maturity of the supply chain to a high level, thus supporting the outsourcing of logistic activities.

Information Systems and Arbitration Between Internalization and Outsourcing of Logistic Activities: The deployment of information systems has profoundly transformed the organizational boundaries of enterprises. Venkatraman (1994) relied on the role of information processes and technologies in transforming organizations. Over a period of five years, he conducted a study in companies that deployed information technology in their structure. The author points out that the more organizations change and adapt their structure and processes, the more interesting the

benefits of deploying information technology. Thus, five levels of integration are identified and presented in the following figure:

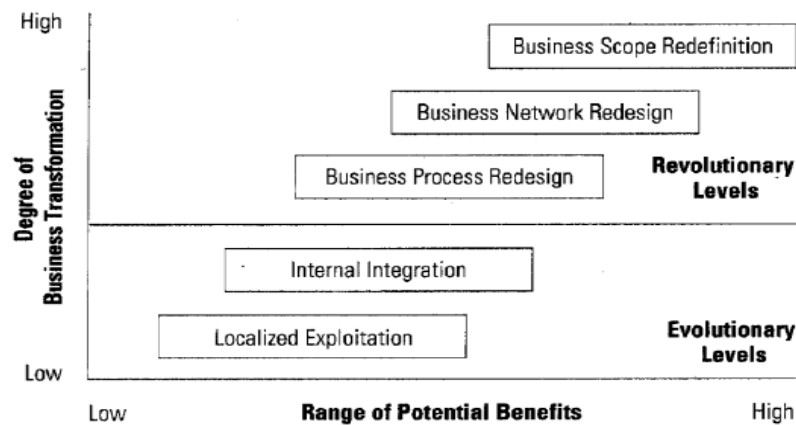


Figure 03: The five levels of organizational transformation through information technology (Venkatraman, 1994)

It is at the level of the redefinition of networks that we observe the practice of outsourcing. To this end, the outsourcing of logistic activities is often accompanied by the implementation and interfacing of information systems between the company and its logistics service provider. In this context, Fabbe-Costes (2002), reports on the importance of information and communication technologies in the management of physical flows in the supply chain and more particularly on the external level, by deploying the Electronic Data Interchange. Today, companies seek to integrate supply chain by sharing and coordinating information flows among all members, enabling them to better define their roles and responsibilities (Kempainen and Ari, 2003). Information systems are considered as the nervous system of the supply chain, considerable efforts have been made by companies to integrate information flows internally, but to integrate information from all actors throughout the supply chain is in itself a major challenge.

At a level of intra-organizational analysis, integrated enterprise resource planning (ERP) are real technologies that enhance the transparency of the internal supply chain by eliminating information distortions and favoring the integration of information. (Akkermans et al., 2003). At a level of inter-organizational analysis, information sharing among members of the supply chain using electronic data interchange (EDI) technology enhances integration, improves logistics system performance, and reduces Uncertainty (Srinivasan et al., 1994). Since logistics service providers play an important role in the integration of supply chain, they have developed expertise in integrating information flows to manage the interfaces between the actors in a supply chain. Fabbe-Costes (1999) states that logistics providers, who develop internal information systems, are now in direct contact with their contractors' logistics information system. For these key players in the supply chain, it is they who realize the circulation, the choices in information technology, as well as in the design of information systems.

In light of these factors, the deployment of information systems contributes to improving the maturity of supply chain, which favors the outsourcing of logistic activities. Therefore, the logistics service provider would be able to manage the interfacing of the information technologies of the players in order to ensure, in good conditions, the operations of collecting the supplier's flows, storing, preparing orders and distributing them in the Quantities, time limits and agreed places.

Analysis Unit

Logistic Activities: The focus of our research is on the arbitration between internalization and outsourcing of logistic activities, so a summary description of the main logistic activities subject to outsourcing are essential. The Outsourcing Barometer of 2008 specifies that the most outsourced logistic activities are transport, storage and warehousing and other logistics activities with high added value.

The activities related to transport are of different types:

- Upstream transport activity: This activity consists of the transport of raw materials, components or sub-assemblies from suppliers to manufacturing plants

- Downstream transport activity: This activity corresponds to the delivery of finished products to the points of sale. These may include large and medium-sized stores, sales shops representing various brands, traditional outlets, etc.
- Courier activity: Express freight operations with a limited weight and volume. This transport activity requires at least one stop in a warehouse to carry out sorting, grouping and unbundling operations
- Freight-forwarding activity: This logistics activity concerns the organization of international transport. Generally, companies outsource this activity to freight forwarders who have the best skills to organize international transport from start to finish through the use of multimodal logistics solutions (sea, air, road and rail). Freight-forwarders also carry out customs formalities and manage the regulatory and tax aspects
- The activities related to storage are:
 - Reception activity: Reception consists first of all of discharging the freight flows of the transport units, of controlling the quantity and the references of the flows received in accordance with the orders and finally of storing, categorizing and palletizing the Streams for transfer to the storage area
 - Storage activity: It is necessary to differentiate the upstream storage from the downstream storage. Upstream storage refers to the maintenance of stocks of inputs composed of raw materials, components or subassemblies that are intended for manufacture. The establishment of the upstream storage warehouse should normally be located near the production basins. As for downstream storage, it most often concerns high-volume or high-volume articles
 - Order picking activity: This activity is designed to meet the individual demands of distributors. It includes administrative processing of orders received by the customer, most often computerized and a physical preparation treatment which consists of taking the quantities ordered (pick) from the locations in the storage area and then packing The ordered items (pack) in order to load the orders in the transport units and to initiate the delivery rounds to the customers
 - Shipping activity: This activity consists of the grouping of parcels by order and the edition of the delivery notes and shipping labels
- Additional activities with high added value are:
 - Kitting Activity: This activity takes care of the pre-assembly, the final assembly or the grouping of the articles in a specific Kit. In general, kitting is an activity consisting in assembling components so as to constitute a single product
 - Co-packing activity: This activity allows the selection of complementary products in order to group them in the same packaging, co-packing is generally used for promotional operations in order to liquidate surplus stocks
 - Delayed Differentiation: Also called "Post Ponment". This activity makes it possible to customize the products at the end of the downstream supply chain. The principle of post-ponation consists in mass production of semi-finished products in order to benefit from economies of scale and to push as far as possible downstream the finishing activities allowing the differentiation of the products according to the needs of each customer, delayed differentiation Allows the reconciliation of low cost manufacturing requirements with differentiating marketing requirements

In order to be able to state our research proposals, we consider the logistic activity as the unit of analysis.

Formulation of Research Proposals: In the end, a traditional and immature supply chain that does not fit into an integration process is not intended to involve a logistics service provider since the exchanges are unpredictable and the nature of the relationship between the actors is purely transactional and does not require standardization of organizational and technological tools. On the other hand, when it comes to mature supply chain, characterized by controlled logistics processes and integrated information flows, companies are inclined to outsource logistics activities.

This leads us to formulate our proposal as follow:

"Logistics activities carried out within an immature supply chain are frequently internalized, on the contrary, logistical activities carried out within mature supply chains are frequently outsourced"

This proposal is declined in sub-proposals:

- Logistic activities linked to immature logistical processes are frequently internalized
- Logistic activities linked to mature logistics processes are frequently outsourced

- Logistic activities that are not managed by information systems are frequently internalized
- Logistic activities that are managed by information systems are frequently outsourced

Table 01: The research proposals

Proposals	Guiding Ideas	Key Authors
Logistics activities carried out within an immature supply chain are frequently internalized. Conversely, logistics activities carried out within mature supply chain are frequently outsourced		
Logistic activities linked to immature logistical processes are frequently internalized	Outsourcing is a practice allowing the integration of the supply chain. The degree of mastery and integration of logistics processes has an impact on the integration of the players in the supply chain	Venkatraman, 1994 ; Lambert et al, 1998 ; Stadler, 2004 ; Lambert et Cooper, 2000 ; Fabbe-Costes, 2007 ; Ayadi, 2009
Logistic activities linked to mature logistics processes are frequently outsourced		
Logistic activities that are not managed by information systems are frequently internalized	Outsourcing is a practice allowing the integration of the supply chain. The deployment of information systems has an impact on the integration of the players in the supply chain	Venkatraman, 1994 ; Lambert et Cooper, 2000 ; Fabbe-Costes, 2002 ; Stadler 2004; Gunasekaran et Ngai 2004 Fabbe-Costes ,2007 ; Ayadi, 2009
Logistic activities that are managed by information systems are frequently outsourced		

Conclusion

The aim of this article is to formulate research proposals through logistics literature dimensions that allow us to evaluate the impact of the maturity level of supply chain on the trade-off between internalization and outsourcing Logistical activities. These research proposals will then be confronted with an empirical terrain consisting of several sectors of activity such as traditional distribution, modern distribution and the automobile and aeronautics industry. The aim is to analyze and understand the logistical maturity of these sectors and its impact on the practices of internalization and outsourcing of logistics activities. The study of the maturity of the sectorial supply chain is essential insofar as a supply chain encompasses several actors that structure a given sector. We believe that logistics activities carried out within an immature supply chain are frequently internalized, whereas logistics activities carried out within a mature supply chain are frequently outsourced.

References

- AFNOR, (2002), *Les fondamentaux du management intégré*, Afnor.
- Agence Marocaine de Développement de la Logistique, (2016), *Guide de l'externalisation des activités logistiques*, disponible à : <http://www.amdl.gov.ma>.
- Akkermans, H.A., Bogerd, P., Yucesan, E., & van Wassenhove, L.N. (2003), "The impact of ERP on supply chain management: Exploratory findings from a European Delphi study", *European Journal of Operational Research*, 146 (2), 284-301.
- Ayadi, S., (2009), "Externalisation et création de valeur au sein de la « Supply Chain » : l'entreprise étendue". *La revue scientifique de gestion*, 2009/2(n°236).
- Baromètre Outsourcing Europe, (2008), *De l'externalisation à la fragmentation des entreprises*, Réalisation par le cabinet Ernst & Young, Paris.
- Colin, J. (2005), "Le supply chain management existe-t-il réellement ? ", *Revue française de gestion*, 2005/3, n° 156, p. 135-149.
- Fabbe-Costes, N. (2002), "Le pilotage des supply chains : un défi pour les systèmes d'information et de communication logistiques", *Gestion 2000*, Vol 19, No. 1, p. 75-92, Janvier-Février.
- Fabbe-Costes, N. (2007), *La gestion des chaînes logistiques multi-acteurs : les dimensions organisationnelles d'une gestion lean et agile* In : La gestion des chaînes logistiques multi-acteurs : perspectives stratégiques.

- Fabbe-Costes, N., Roussat, C., (2011), "Supply Chain Integration: Views from a Logistics Service Provider", *Supply Chain Forum: an International Journal special issue 8th International Meeting for Research in Logistics (RIRL 2010)*, Vol.12, N°2, 2011, pp.20-30.
- Gunasekaran A., Ngai E.W.T., (2004), "Information systems in supply chain integration and management", *European Journal of Operational Research* (159), pg 269–295
- Kempainen, K., Ari, P.J.V., (2003), "Trends in industrial supply chains and networks", *International journal of physical distribution & logistics management*, vol. 33, p. 701-719.
- Lambert, D.M., Cooper, M.C. (2000), "Issues in Supply Chain Management", *Industrial Marketing Management* 29, pp. 65-83.
- Lambert, D.M., Cooper, M.C., & Pagh, J.D. (1998), "Supply Chain Management: Implementation Issues and Research Opportunities", *The International Journal of Logistics Management*, Vol. 9, n.2, p.1-19.
- Lambert, D.M.; Cooper, M.C. (2000), "Issues in Supply Chain Management", *Industrial Marketing Management* 29, pp. 65-83.
- Maloni, M. and Carter, C. (2006), "Opportunities for Research in Third-Party Logistics," *Transportation Journal*, 45, 2, 23-38.
- Marasco, A., (2007), "Third-party logistics: A literature review," *International Journal of Production Economics*, In Press, Accepted Manuscript
- Mentzer, J.T., DeWitt, W., Keebler, J.S., Min, S., Nix, N.W., Smith, C.D. & Zacharia, Z.G. (2001), "What is supply chain management", in *Mentzer, J.T. (Ed.), Supply Chain Management*, Sage, Thousand Oaks, CA, pp. 1-25.
- Paché, G., Sauvage, T. (2004), *La logistique Enjeux Stratégiques*, Vuibert 3è édition, Paris.
- Salomon, C. (2003), *De la conception collaborative à la Supply Chain étendue*. Les dossiers du pôle productique Rhône Alpes. N°72.2003.
- Srinivasan, K., Kekre, S., Mukhopadhyay, T. (1994), "Impact of Electronic Data Interchange Technology on JIT Shipments", *Management Science* (40:10), pp. 1291-1304.
- Stadtler, H. (2004), "Supply Chain Management and Advanced Planning, Basics, Overview and Challenges", *European Journal of Operational Research*.
- Supply Chain Council, (2010), *Supply-Chain Operations Reference-model (SCOR). Overview. Version 10.0*.
- Venkatraman, N. (1994), "IT-Enabled Business Transformation: from Automation to Business Scope Redefinition", *In Sloan Management Review*, winter, pp. 73-87.