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# **Exploring Leagile Supply Chain: Advantages & Characteristics**

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**ABSTRACT:** This paper examines and analyzes Leagile Supply Chain Strategy in order to encircle all the characteristics and advantages regarding many dimensions. Actually, SCM deals with the relations among SC actors through coordinating and integrating all the activities, namely the intra and inter-organizational processes. Indeed, when developing a SC strategy, it is important that it is designed in a way that leverages the contribution of each SC actor in terms of value creation. In addition, it is the characteristics of the products and the market that govern the sharing of roles and responsibilities between the actors of the SC. Based on this, this article aims to list and identify the different Leagile SC strategy, that combine between leaness and Agility and to propose a profile relating to this strategy based on an in-depth literature review.

**KEY WORDS:** Leagile Supply Chain, Decoupling Point, Strategy.

## **I. INTRODUCTION**

The leagile supply chain management paradigm includes lean and agile principles and has attracted the attention of practitioners and researchers as well regarding its importance in the current research and thinking. Actually, the Lean concept is very suitable when the demand is relatively stable and therefore predictable as well as the variety is low (Aitken et al., 2002). Cost reduction is the driver of Lean SC, but also the speed of delivery and the quality of products and services (Basu & Wright, 2010, p. 204). According to Agility, for Christopher & Peck, (2004), this strategy presents the ability to respond quickly to unpredictable changes in demand (downstream flow) and supply (upstream flow). Companies that are characterized by a relatively long response time to market demand or supply disruption are at risk. Agility is articulated on two main elements, the visibility and velocity of the SC. Visibility is the ability to have a clear view of the entire CS. This implies a clear vision on the upstream and downstream flows, and their conditions. This helps to reduce the bullwhip effect, which helps meet customer needs precisely, in terms of cost, delivery time, and quality, etc. The velocity or speed of the SC relates to the end-to-end material and product circulation time of the SC which must be reduced. This time represents the length of time that the customer must wait from the initiation of an order until the delivery of the finished products. Like the Lean and Agile SC strategy, the Leagile Supply Chain strategy is considered as a type that encompasses the previous two strategies. The Leagile SC generally mobilizes the assembly-to-order policy (Vonderembse et al., 2006). The authors add that, according to this policy, forecasts on customer demand can be drawn up in a relatively rational and precise manner. This strategy makes it possible to standardize the components in order to benefit from economies of scale, and delay the differentiation of products until the final assembly of the product which is generally done following receipt of an order from customers where the attributes required in the product are known. The techniques of the Lean and Agile strategy are combined in this strategy to produce the product components. Some components are produced using Lean principles, such as airbags, while other innovative components, such as electronic devices, require the adoption of the Agile SC strategy. In addition, responsiveness is needed in the interface between the company and the market in order to be flexible in integrating new expectations into the process along the SC.

Many researchers have dealt with the issue of Leagile Supply Chain. For example, Galankashi & Helmi (2016) proposed a new assessment tool for leagility, the research design tended to systematically propose a model to classify all operational activities related to leagile SC. So, the Leagile SC operational activities have been identified and classified regarding to SC drivers. These activities were ranked using an analytic hierarchy process and were then categorized using a cycle view of SC. Likewise, NurulHaq and Boddu (2017), have analyzed the enablers to implement and put into effect leagile supply chain strategy using an integrated fuzzy QFD approach. Finally, (Agrawal & Vinodh,

2021) have explored the challenges facing Leagile Supply Chain analysis in manufacturing context during the Covid-19 period.

## II. LEAGILE SUPPLY CHAIN ADVANTAGES: AN OVERVIEW

According to (Sanders, 2012, p.03), the concept of SCM may appear simple but it is not in reality because it is a very complex business concept due to the nature and type of decisions involved. Thus, SCM has been the subject of as many definitions as the concept of SC, both in the literature and in professional and consulting organizations, hence the definition of this concept and what it can encompass. remains relatively vague (Quayle, 2006). SCM can be seen as the design and management of the flow of products, information, and financial flows through the SC. This involves the coordination and management of all SC activities (Reid & Sanders, 2010; Russell & Taylor, 2010; Sanders, 2012). According to (Stadtler, 2005) “The mission of the SCM is the integration of organizational units along the SC network and the coordination of physical, informational and financial flows in order to fulfill the demands of end consumers with the objective of improve the competitiveness of the CS as a whole”. Figure 1 shows the two main missions of the SCM.



Fig1. Main missions of the SCM according to Stadtler (2005, p.576)

From the definitions cited above, we can see that SCM emphasizes the relationships between CS actors. These inter-organizational relationships can eventually subsist without being managed. So SCM is about managing these relationships by coordinating and integrating intra and inter-organizational activities and processes across all SC actors. This integration and coordination allows better satisfaction of customer requirements for products and services at a higher value and at a lower cost.

According to (Christopher, 2011, p. 102), the leagile SC strategy aims to build an agile response solution on a Lean platform, striving to apply Lean principles till the decoupling point, and then agile principles beyond that point to customer interaction. (Towill & Christopher, 2007) show that processes are designed to be Lean upstream from the decoupling point, and agile downstream from the point of decoupling. An example of the application of this strategy may be the automotive industry in which painting and accessories are delayed until information on customer demand is actually available. Leagile Supply Chains combine the capabilities of Lean and Agile SC to meet the needs of complex products made up of components that require Lean and Agile SC principles (Sukati et al., 2012).

As for (Naylor et al., 1999), they use the concept of decoupling point in order to separate the part of the Supply Chain that responds directly to the customer (demand is variable and the variety of products is high) from the part of the supply chain. the Supply Chain which uses forecasts and a strategic stock in order to control the variability of demand (demand is relatively stable and products are standard). The following Figure 2 illustrates this idea.

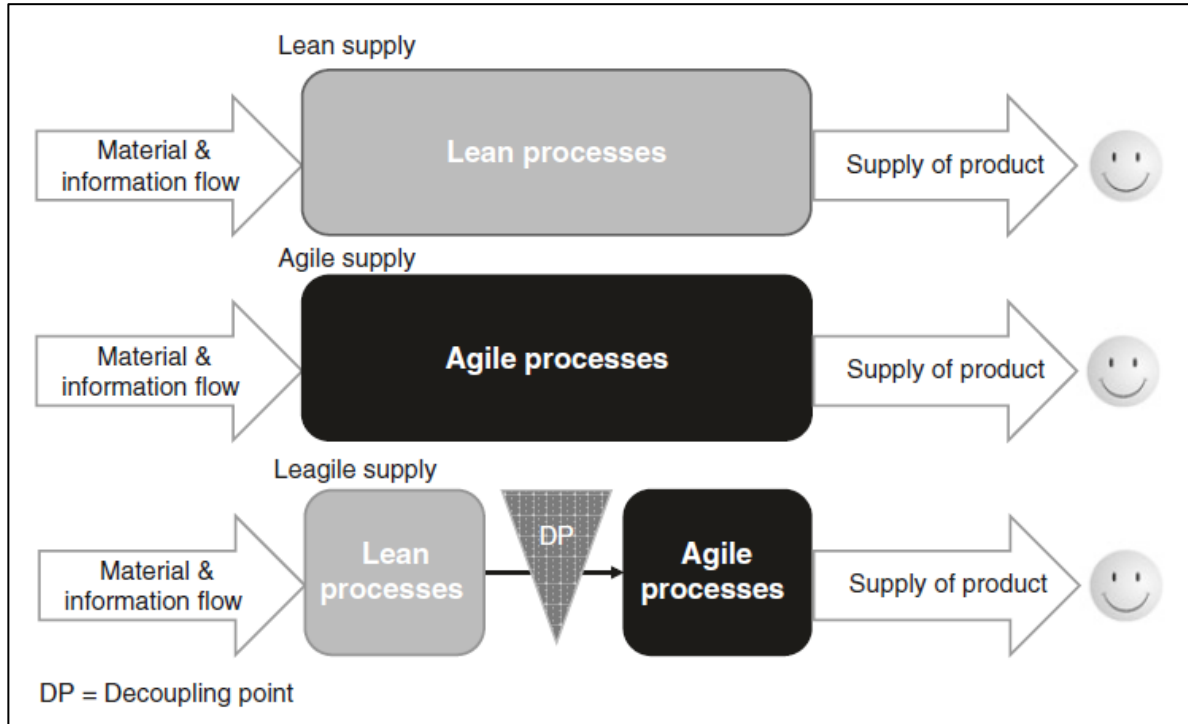


Fig 2. Decoupling Point in Leagile Strategy

In order to acquire a higher level of agility and decrease the uncertainty associated with SC, companies can resort to the Agile SC strategy which consists of postponing all the steps that differentiate the product according to customer demand until that they have actual orders, which allows them to be responsive in responding to customer expectations and not running the risk of manufacturing a product that does not meet market demand. This strategy involves delaying the setup, assembly and distribution of products (Christopher, 2011, p. 114). The decoupling point positioning should be done in a manner that suits the level of responsiveness needed to volatile downstream demand while determining the level of upstream programming based on market forecasts (Agarwal et al., 2006).

It is relevant to say that the Lean and Agile paradigms are not mutually exclusive paradigms (Towill & Christopher, 2007). In addition, for better performance in a relatively uncertain environment, it is advisable to combine the two strategies in order to best meet customer expectations (Naylor et al., 1999). Indeed, the SC strategy can be Lean in one time and Agile in another time and both (Leagile) for another time (Agarwal et al., 2006). Along the same lines, (Chopra & Meindl, 2007, p. 35) show that there is no SC strategy that is relevant all the time, but there is a good SC strategy for a given competitive strategy.

### III. LEAGILE SUPPLY CHAIN CHARACTERISTICS

Based on the demonstration above, Table 1 summarizes the Leagile Supply Chain Strategy regarding multiples dimensions as follow:

Table 1: Main characteristics of Leagile Supply Chain

Dimensions	Leagile SC Characteristics
<b>Définition</b>	This strategy aims to build an agile response solution on a Lean platform, striving to apply Lean principles to the point of decoupling, and agile principles beyond that point to customers.
<b>Objectives</b>	Lean production Delayed customization Market responsiveness
<b>Organizational Structure</b>	Static structure with temporal relationships with partners in order to integrate innovative components
<b>Manufacturing Planning</b>	Work on confirmed orders and reliable forecasts with a certain ability to achieve a certain variety of products.
<b>Manufacturing Methods</b>	Combined
<b>Intégration</b>	Similar to Lean Supply Chain at component level and follow Agile Supply Chain at product level
<b>Product lifecycle</b>	Assembly to order. long maturity phase
<b>Alliances</b>	traditional operational and strategic alliances in order to respond to changes in customer expectations.
<b>Market</b>	Meet customer needs with innovative features in existing products. This allows the organization to capture more of that product market.
<b>Product design strategy</b>	Use modular design to delay product differentiation as long as possible.
<b>Demande Structure</b>	Predictable demand with a small gap for products while components may have a large gap.
<b>Price Strategy</b>	Moderate margin The price is an advantageous factor.
<b>Sourcing strategy</b>	selection of suppliers based on cost and quality as well as capacity for speed and flexibility, when needed.
<b>Production strategy</b>	Combining between Lean SC strategy and Agile SC strategy.
<b>Deadline management strategy</b>	Similar to Lean SC for components. Reduce lead times for products.
<b>Inventory management strategy</b>	Delayed differentiation of products and minimization of stock of components
<b>HR Strategy</b>	Empowerment of people working as a team in their functional departments.
<b>Product features</b>	Complex product Medium variety Average margin
<b>Process characteristics</b>	Flexibility and responsiveness to the market Delayed differentiation Lean principles before the decoupling point and Agile after this point.



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## IV. CONCLUSION AND FUTURE WORK

Starting from this last idea that Supply Chain strategies are not mutually exclusive. We will adopt, for our research, two types of Supply Chain strategies: a mainly Lean Supply Chain strategy (SSCL) where Lean principles are predominant and a mainly Agile Supply Chain strategy (SSCA) in the opposite case, namely, when the Agile practices prevail in the operation of the company. To conclude, this article consists of studying the Leagile Supply Chain strategies from several angles. In other words, the purpose of this study was to analyze Supply Chain strategies to develop, first of all, a strategic profile relating to Leagile Supply Chain strategy. and this, through answering our main question: what are advantages and characteristics of Leagile Supply Chain? Answering all these questions led us to address the following points: objectives, organizational structure, planning mode, production techniques, level of intra-organizational and inter-organizational integration, the product life cycle, type of alliances with upstream and downstream collaborators, market and product characteristics, demand structure, functional strategies such as product design, supply, price, the management of delivery times, the stock management policy, human resources, and finally the characteristics of the processes. In order to answer our research question, our article was structured as follows: first, we approached the key concept around which our research revolves, namely, Supply Chain Management. Then, we approached, more closely, the SC strategies. In addition, these typologies have given us a clear idea of the characteristics relating to each type of SC strategy, as well as the SC capabilities that need to be developed and implemented in order to support the appropriate SC strategy.

Like any research work, our work has certain limits, the first limit is of a theoretical nature concerning the Supply Chain strategies which correspond to the typologies of competitiveness strategies such as the Miles & Snow typology which enumerated four competitiveness strategies, to Namely, for our research, we have adopted Supply Chain strategies that take into account product and market characteristics such as those proposed by Fisher and Porter. In the same vein, the second theoretical limitation is that this article has contented itself with presenting the different tools used in each SC strategy without classifying these tools according to their importance. The second limitation could be of a methodological nature concerning the absence of an empirical study. Indeed, a comparative study could have been beneficial based on an evaluation of the logistics practices and the strategies of two companies in the same sector of activity and having two different customer segments in order to fully understand the way in which each company responds to the requirements. customer expectations. Finally, these limits could be the subject of future research work.

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