

## Supply Chain Strategy – Necessity of a structured method of deduction

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**Abstract.** Providing a transparent construct of objectives and strategies within supply chains has become more and more important over the last decades especially in highly interdependent supply chain structures,. However, in practice there is a notable lack in embedding supply chain strategies within company's structures. Therefore, the purpose of this paper is to develop a generally applicable procedure to establish a strategic focus over the company's supply chain (SC) activities that at the same time supports a good fit with surrounding value network conditions (e.g. customer requirements or supplier scenarios). Based on relevant literature, the following topics seem to be of particular importance: supply chain management (SCM) with a lack of strategic focus, the need for implementation of a supply chain strategy and the required characteristics that determine a supply chain strategy. In addition, a supply chain strategy will be described with a special focus on the supply chain characteristics 'lean' and 'agile'.

**Keywords:** supply chain management, supply chain strategy, strategic alignment, strategic fit, lean, agile

### 1. Supply Chain Management - Introduction

Strategy is important and requires conceptual clarity. However, there is the need to clarify the term 'supply chain management' in general and within the context of this article, before examining the term 'supply chain strategy' as it has remained a disputed discussion issue. Although SCM is relatively new as an idea - it first emerged in an early form less than 30 years ago - it was quickly picked up by academics, consultants and practitioners [1]. [2] assessed the state of research in SCM and logistics by examining the research design, number of hypothesis testing, research methods and data analysis techniques used in papers. It becomes apparent that the right definition of SCM or close terms is still discussed, and it seems to be unclear how and if logistics and SCM are connected or not. While [3] or [4] do not distinguish between logistics and SCM, [5], [6], [7], [8], [9] and [10] undoubtedly see SCM as a further development of logistics management. [11] are to the point in identifying four different perspectives when considering the interrelation of logistics and SCM: The traditionalist perspective positions SCM within logistics, the relabeling perspective simply renames logistics, the unionist perspective treats logistics as a part of SCM and the inter-sectionist perspective sees an overlap between logistics and SCM. The following elaborations of the article are based on the unionist perspective as more and more companies consider SCM as more than just logistics and agree with [9] who state: *'There is definitely a need for the integration of business operations in the supply chain that goes beyond logistics.'* Following this fundamental positioning, the SCM definition of [12] seems to be appropriate for this article: *'Supply chain management is defined as the systemic, strategic coordination of the traditional business functions and the tactics across these business functions within a*

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*particular company and across businesses within the supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole.* Visualizing and managing supply chains is becoming more challenging and complicated as companies become increasingly global and have to offer, due to current trends (e.g. mass customization and diverging customer needs) higher product variety while having shorter product life cycles, to better survive in competition [13], [14]. Therefore, SCM has been attracting more attention among leading companies in recent years and it is necessary to do more in this area [15]. It is important to raise awareness that supply chains exist whether they are managed or not [12]. Hence, a more strategic perspective of SCM is becoming more and more important as the company's performance is linked to its strategic anchoring.

## **2. Supply Chain Strategy – An essential necessity for the company's success**

The challenge is to achieve alignment of a cross-company supply chain (SC) strategy with the strategic intent of the businesses to create value and enable growth over the whole SC [15]. Despite the apparent necessity of a cross-company synchronization of value-adding activities to satisfy customer needs, developing and managing a SC strategy is neither a matter of course nor widespread [16]. [17] identified indicators of the immaturity of a SC strategy especially in Europe that may sound familiar to a broad field of companies:

- in top management there is only a limited presence of SC directors and those who do exist rarely have the responsibility for the full scope of the SC
- the majority of companies focus on a 'one-size-fits-all' approach to develop a SC strategy and lose track of the main aspect – the customer.
- customer segmentation is often only done according to account value – with no direct link to SC strategy
- strategic SC alignment is still in its beginning phase although SCM is partly executed in companies

The overall aim of this paper is to show aspects of how to formulate and anchor a SC strategy under the consideration of the given conditions within the company's SC. The remainder of the paper is as follows: Section III describes SC strategy in detail and is followed by the necessity of alignment in Section IV. Section V concentrates on formulating a SC strategy with a special focus on the SC characteristics 'lean' and 'agile'. Concluding the article, the further research need is highlighted.

## **3. Supply Chain Strategy – Definition and Meaning**

The term 'Supply chain strategy' is heterogeneously defined in literature [6]. [18] state that the SC strategy describes in which areas a company wants to succeed with the SC and how it supports the achievement of the company's goals. Following [19] the SC strategy influences the nature of SC activities, the efficiency and effectiveness of the SC, and relationships with other members within the entire SC. Considered from a different perspective by defining a SC strategy by its elements, [6] see the corner stones of a SC strategy in the prioritized goals of SCM and the package of measures to reach it. [16] define the main components of a SC strategy as the operations-, channel-, outsourcing-, customer service strategy and asset network. [20] state that SC strategy consists of the following key dimensions: sourcing strategy, demand flow strategy, customer service strategy and supply chain integration strategy. [21] affirm that a SC determines the material flow, cross-company transportation, production, distribution and outsourcing decisions. The narrowly considered focus of these heterogeneous definitions has led us to follow the definition of [22] who define SC strategy as follows: *'Supply chain strategy can be defined as the decisions that shape the long-term capabilities of the company's supply chain functions and their contribution to overall strategy through the ongoing reconciliation of market requirements and supply chain resources. From a core competency perspective, supply chain strategy defines what operations, logistics, and sourcing will try to do better than the competition.'* As the SC strategy in the following sections refers to the core-elements of a SC strategy: *SOURCE, MAKE, DELIVER, PLAN* [17], the extension of the definition of [22] arises: *'From a core competency perspective, supply chain strategy defines what operations in the core processes SOURCE, MAKE, DELIVER and PLAN will try to do better than the competition.'* [23] summarize the potential of a SC strategy. It involves switching from: *'inward thinking to organized interdependence;*

*cost minimization to finding advantages over the competition; proprietary information systems to an open, progressive, Internet-based network; stock control to information sharing; multiple exchange processes to a process of globally optimized exchange; open competition to organized competition ('coopetition'); a win-lose situation to a win-win strategy for all those participating in the network'*

In order to tap the potential, it is important that the SC strategy goes along with the overall business objectives and company policies.

#### 4. SC Strategy – Alignment is the Key

The necessity of aligning the SC strategy with other strategies is highlighted by a remarkable amount of researchers: [24], [16], [25], [20], [18], [17], [26], [15], [27], [28] and [6]. Following the authors, a SC strategy has to be aligned with your SC partners' strategies, with your business strategy including the competitive strategy and top management focus, internally with other functional strategies and with your customers' needs. [16] highlight that these points may sound simple and obvious but few companies actually follow them. As the topic SC strategy is addressed by a considerable number of researchers, it is surprising that SC strategy is unanchored in a lot of companies [17]. [29] empirically investigate the mediation role of SC strategy between corporate strategy and business/SC performance in the Indian manufacturing industry. It was also found that choice of CS and SCS affects business and SC performance. They developed a matrix of strategic fit to identify which SC strategy is most suitable for a given competitive strategy. Due to the alignment necessity identified above the SC strategy was positioned, based on the literature reviewed, in the case company's strategy landscape.

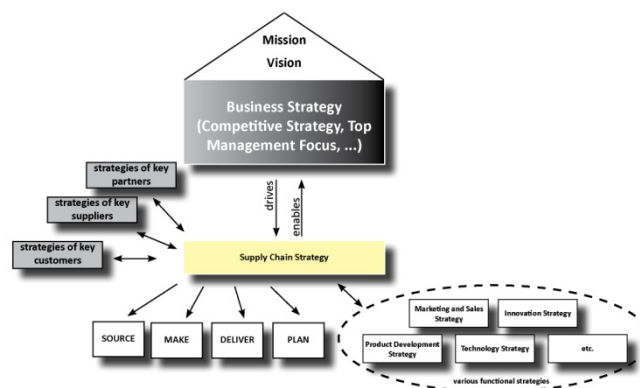


Fig. 1: Supply Chain Strategy Anchoring

Following an illustration of [25], the business strategy of a company drives the SC strategy, while the SC strategy enables the business strategy. As described above, SCM is a further development of logistics management. Therefore, a SC strategy drives its core areas *SOURCE*, *MAKE*, *DELIVER* and *PLAN* [17] in a cross-company focus. The continuous shift from an internal focus to an extended focus including key customers and suppliers [16], the positioning of the strategies of the core customers and suppliers next to the company's SC strategy seems to be useful. Referring to the definition of [12] quoted above, the strategies of further key partners are taken into consideration as the SC should be considered as a whole. [20] address the importance of aligning each company's SC strategy and those of its SC partners. SC strategy differs from traditionally accepted company strategies in that it requires the coordination and commitment of multiple firms to implement strategic objectives [30]. In addition, it is essential to recognize that SC strategy cannot be considered in isolation from other strategies in the company. A SC strategy has to be in harmony with them [6]. Therefore, the strong interrelation of SC strategy with functional strategies is highlighted and SC strategy is positioned between the business strategy and functional strategies of companies as those functional strategies are involved in cross-company related process decisions too. [16] state that SC strategy should be aligned with marketing and sales, technology, service and product development strategies in the next-generation of SC strategies.

## 5. SC Strategy – Development

The previously described explanations demonstrate that a SC strategy is essential in present business conditions. The next question to be answered is ‘How to formulate a SC strategy?’ The following approach towards developing and implementing a SC strategy is orientated towards [31].

### 5.1. Intelligence

[31] define the first phase as ‘Intelligence’. The main aim of this process is to analyze the market as it is a major criteria for the SC. Market requirements determine which characteristics a SC has to offer to be competitive and to differentiate itself from the competitors [18]. [31] group these requirements into order qualifiers and winners. Referring to [32], Quality, Cost, Lead time & Service Level are possible order winners and order qualifiers. [31] propose an analysis of strengths and weaknesses as well as opportunities and threats of the SC to finally have a SWOT analysis with the result of needs for action and potential for improvements within the SC.

### 5.2. Design

The next phase of [31] is grouped into several steps stated as important points by [21].

#### 1) ‘Understanding the customer and supply chain uncertainty’ [21]

An essential part of the design phase is the segmentation of customers. It is crucial to understand customer needs for each targeted segment [20]. The identified needs help the company in defining the desired cost and service requirements [21]. The following issues, based on [21], have to be considered: response time that customers are willing to tolerate, product variety needed, service level required, price of the product, desired rate of innovation, segment-specific product requirements etc. As the aim of the consolidation of customers is to gain segments of customers with similar needs it is obvious that *‘each customer in a particular segment will tend to have similar needs, whereas customers in different segments can have very different needs.’* [21] A segmented customer landscape enables the deduction of strategic priorities. Possible priorities identified by [6] can be: high productivity, high customer-orientation, high ability to supply, high profitability, high innovation-rate, high flexibility, high liquidity, high responsiveness, sustainable growth, low inventory/capital commitment, low logistical costs, etc. Due to the fact that future developments are hardly predictable and manipulable, the ability to adapt accordingly to the changed business conditions is becoming increasingly important for companies. The management and control of potential uncertainties in material and information flows is a prerequisite in order to make the required adaptability possible [33]. On an abstract level, three potential sources for uncertainty exist: the suppliers, production and customers [34]. As the customer segments have to be served with products that have to be sourced, [13] sees demand and supply uncertainty as equally important drivers for the right SC strategy.

#### 2) ‘Understanding the supply chain capabilities’ [21]

The relevant literature has identified several theoretic approaches to explain the establishment of firms in principle – today in close interconnection with connected value network partners (customers, suppliers, service providers, technology partners etc.). Thus, during early stages of theoretic development the differentiation between the so-called market-based view ([35], [36], [37], [38]) that has currently developed further towards a customer-driven SCM perspective (e.g., [39], [40] and on the other hand the resource based view (RBV, [41], [42], [43], {[44], [45]) was intensively discussed. While market-oriented strategic approaches predominantly define company value or business success from a competitor- and market-oriented view, the RBV rather emphasizes unique resources or abilities as the source of competitive advantage. With growing volatility, the RBV was enhanced according to a growing importance of the ability to “reconfigure, redirect, transform, and appropriately shape and integrate existing core competences with external resources and strategic and complementary assets to meet the challenges of a time-pressured, rapidly changing Schumpeterian world of competition and imitation.” [46]. These so-called “dynamic capabilities” ([46], also cp. [47], [48], [49], [50], [51], [52], [53]) also include process improvement and organizational learning [54] and – from a SCM-oriented perspective – a continuous adaptation of resources and routines to permanently changing demands [39] in order to develop new sources of competitive advantages in the face of changes. Thus, Chopra’s claim to understand the SC capabilities [21], actually means to understand a complex and

dynamically changing bundle of capabilities that depend on each other in a non-linear and recursive manner ([55], [56], [57]). Since such cumulative influence factors imply trade-offs among each other ([58], [59]), developing a SC strategy means to balance complex and at most scarcely determinable coherences. This regards both, SC-design and SC-operations:

- SC-design: For example, a company may decide deriving a customer-requested performance level through adaptive capability [60], i.e., through setting up internal routines and resources, or from absorptive capability [60], thus deriving a strategic resource or knowledge from external sources or through SC-cooperation.
- SC-operations: For example, the coherence between demand-changes and achievable production cycle time is non-linear. Thus, periods of changing demand and utilization might have minor impacts on a company's cycle time at a low utilization level while the same changes are notably affecting a company with a currently high utilization level. Regarding the factual capabilities of both companies to respond to demand uncertainty, one would evaluate the first company as "being capable to respond" to the mentioned changes, while the second company wouldn't be characterized to possess this capability. This might analogously apply to a single company during different economic periods: While being capable to respond in year 1 (depression period, low utilization, high flexibility), the same company "surprisingly" might not be able to respond adequately in year 2 anymore (growth period, high utilization, low flexibility) though there was no obvious change of the company capabilities at first sight.

Altogether, successful SC-strategy development means to first, understand the actual customer and market dynamics and to subsequently dynamically link its SC capabilities to these requirements under dynamic and eventually non-linear conditions as described in the two examples above within SC-design and SC-operations. After evaluating and segmenting customers and identification of segment-related priorities, it is necessary to understand how the company best meets this certain or uncertain demand [21]. Consideration of the positioning of the CODP by [61] can support this process. A high response time tolerated by the customer, in combination with a high product variety needed may require a different positioning of the CODP than a short response time tolerated by the customer in combination with a low product variety needed. Companies often provide standardized products that customers can purchase right from stock but at the same time they offer highly customized products to establish their power position as premium seller. *'Supply chain strategies that are based on a one-size-fits-all or a try-everything mentality will fail.'* [13] Therefore, it is necessary to distinguish between various customers and products. [21] add an important point to consider: *'As companies serve multiple customer segments with differing products, it is important to treat different segments with different strategies. This strategy is feasible if each segment is large enough to support a dedicated supply chain. It fails, when economies of scope exist between a company's different products. Therefore, a preferable strategy is to tailor the supply chain to best meet the needs of each. This requires sharing some links in the supply chain with other products while having separate operations for other links.'* It is not necessary for companies to be either agile or lean in their SC strategy [19]. The main aim will be to join the lean and agile paradigms that are apparently different, but can be and have been combined within successfully designed and operated total supply chains [32]. Based on the literature, we want to characterize the ideal-typical characteristics of lean and agile as they are described as possible dimensions of SC strategies [19]: As the market winners and qualifiers identified in the first phase as well as the customer and product segments and related strategic priorities identified in the subsequent process came to the conclusion that there is the need of different SC strategies we will go further in detail of the core processes within a SC strategy. For reasons of clarity and comprehensibility we have compiled several tables contain the contributions from several authors who cover similar or the same topics

Table I. Lean and Agile Characteristics

	Characteristics	
	<i>Lean</i>	<i>Agile</i>
<b>focus</b>	efficiency	effectiveness & flexibility
<b>measures</b>	productivity & cost	ability to supply & customer satisfaction
<b>impulse</b>	forecast-driven	customer-order- and market-driven
<b>product life cycle</b>	short	long

	Characteristics	
	<i>Lean</i>	<i>Agile</i>
<b>product and process variety</b>	low	high
<b>product type</b>	functional	innovative
<b>focus decreasing lead time</b>	...without having cost-impacts	...without having flexibility-impact
<b>contribution margin</b>	low	high
<b>supply uncertainty</b>	low	high
<b>demand uncertainty</b>	low	high

Sources: [63], [64], [65], [66], [67], [68], [69], [13], [70], [71], [32], [72], [73], [74]

Acting lean or/and agile within *SOURCE* is mainly related to supplier-related decisions and processes. Referring to the characteristics listed in Table I, the strategies will differ in their purpose. When lean sourcing is requested, a low supply uncertainty allows single sourcing, while agile requires more flexibility by multiple sourcing. Production-related decisions within *MAKE* should also follow a cross-company focus. They have to be aligned with other areas to fulfill the demand the production faces.

Table II. Lean and Agile Strategies within *SOURCE* and *MAKE*

<i>SOURCE</i>	Characteristics		<i>MAKE</i>	Characteristics	
	<i>Lean</i>	<i>Agile</i>		<i>Lean</i>	<i>Agile</i>
<b>sourcing strategy</b>	Single/Dual	Dual/Multiple	<b>production type &amp; control</b>	Make to Stock or even better Make to Forecast / push	Customize/Make/Build/Engineer to Order / pull
<b>sourcing strategy (time-related)</b>	tendency to JIT and JIS	tendency to demand-driven	<b>production system</b>	lean inevitable	lean supportive
<b>supplier identification and selection</b>	...according to costs and reliability	...according to responsiveness, flexibility, short replenishment lead times and reliability	<b>postponement</b>	...to support efficient production	...to support flexible production
<b>supplier integration and development</b>	...for efficiency reasons	...for flexibility reasons	<b>setting-up</b>	least possible	flexible
<b>supplier contracts</b>	...adapted to product life cycles (by trend long-term)	...adapted to product life cycles (by trend short-term)	<b>buffer stock</b>	least possible	adequate
			<b>batch sizes</b>	stable	flexible
			<b>product structure</b>	simple	modular

Sources *SOURCE*: [75], [65], [66], [67], [76], [69], [70], [74], [77], [77]

Sources *MAKE*: [63], [75], [65], [66], [66], [70], [71], [72], [74]

As the direct link to the customer, the strategies set within *DELIVER* should enable the company to react to flexibly and/or efficiently. Planning is the core-element of economic day-to-day business [79]. Therefore, it is necessary to align the planning activities within *PLAN* in a cross-departmental as well as a cross-company way.

Table III. Lean and Agile Strategies within *DELIVER* and *PLAN*

<i>DELIVER</i>	Characteristics		<i>PLAN</i>	Characteristics	
	<i>Lean</i>	<i>Agile</i>		<i>Lean</i>	<i>Agile</i>
stock of finished goods	process flow oriented, efficient, least possible	customer oriented, optimized, least possible	demand planning	forecast-driven	demand-driven
stock of finished goods (management)	centrally/process flow oriented, efficient	decentralized/customer oriented, optimized	production planning	cost- and capacity-driven	demand-driven
sales and distribution	most efficient one	most customer-oriented one	planning intensity	low, disaggregated	high, aggregated
pricing policy	low pricing	high pricing	forecast-horizon	longer	shorter
contractual partners	few	adequate amount	capacity planning	stable and high	variable and low
marketing	usually indirect	increasingly direct			
transportation	focus: low tied capital	focus: short distance to customer			
container circulation	recommendable	hardly realizable			
customer integration	...for efficiency reasons	...for flexibility reasons			

Sources *DELIVER*: [63], [75], [65], [66], [66], [70], [32], [71], [78], [77]

Sources *PLAN*: [63], [65], [66], [76], [67], [70], [71], [72]

In the next step, it is of importance to check the consistency with previous phases. On comparison, the previous phases ‘Understanding the customer and SC uncertainty’ with ‘Understanding the SC capabilities’ have to match. If any mismatch exists between them, the company will either need to restructure the SC to support the competitive strategy or alter its strategy [21]. As described above, the alignment with the business strategy and other functional strategies is of particular importance and has to be taken into consideration at this stage to avoid future problems due to misalignment. The strategy defined has to be consistent with the objectives, aligned with its environment and feasible within the company [6].

### **5.3. Implementation and Review**

A lot of companies fail with the implementation of a SC strategy, although there are enough resources. One reason is inconsistent and incomplete SC strategies. Therefore, the monitoring during the SC implementation is important to avoid failure [18]. Following [6], project and change management during the implementation is needed. Project teams, responsibilities, meeting structures, project plans, etc. have to be set up as well as the need and urgency of such a change communicated. In addition, it is necessary to design various processes, including IT, organizational structure as well as information flows etc. according to the SC strategy.

## **6. Conclusion and Further Research Needs**

On the basis of a literature review, the necessity and characteristics of a SC strategy within companies were highlighted. The formulation and implementation of a SC strategy with respect to current conditions can significantly ease the day-to-day business. It is therefore valuable to concentrate research efforts on that topic. In relation to the overall aim to implement a SC strategy, the outcome of this paper can be seen as a step within the orientation phase in the overall research project of developing an implemented SC strategy. At present stage the procedure to formulate a SC strategy is theoretical. It is necessary to empirically validate the practical applicability. The insights of the present research work should be tested and validated on a broader empirical base, e.g. in the course of case studies and scenario simulation, in forthcoming research projects. The next step will therefore be the application of the developed procedure in a case company which is a high-end producer in the agricultural industry facing exactly the conditions and problems described above leading to the need of an implemented SC strategy.

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