Formulating and Implementing Supply Chain Strategy: Extension of Organization Strategy Framework

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Abstract

In a supply chain (SC), core company and its suppliers and customer-based organizations are involved. Here we address issues of SC strategy formulation, and SC strategy implementation by extending the framework of strategy formulation and implementation for business organizations. We consider the issues of SC internal/external consistency, SC resources for capability and flexibility, and SC risk mitigation. This issue has received little attention in literature.

Keywords
Supply chain (SC) strategy, SC strategy formulation, SC strategy implementation

1. Introduction

Strategy formulation and implementation at an organization/strategic business unit/conglomerate level is well developed (Ansoff 1988; Certo, 1991; Porter, 1980; Tilles, 1963). This framework is extended to supply chain strategy formulation and implementation; and latest research in supply chain is integrated into a unified framework. It is hoped that it could be useful in formulating and implementing supply chain strategy.

2. Supply Chain Strategy Formulation

The following factors for the formulation of a supply chain strategy were collected from strategy formulation literature of organization and later extended to supply chain.

1. Internal consistency
   - Triple-A supply chain
   - Supply chain integration
2. External consistency
   - Environmental uncertainty
3. Resources & capabilities of the supply chain
   - Resources of the supply chain
   - Supply chain flexibility
4. Supply chain risk mitigation

These factors will be discussed in brief in the following sub-sections:

2.1 Internal consistency

Organizational strategy has been described as a pattern of decisions about the organization's structure, and processes (Miller and Roth, 1994).

Internal consistency has been considered by Tilles (1963) and referred to the unity of purpose among different functions of an organization. Extending this to the context of supply chain, it refers to the way in which a company's supply chain activities as designed by the supply chain strategy interact and reinforce one another. In a well-worked-out supply chain strategy, each activity fits into an integrated pattern (Tilles, 1963). Also, it has to be consistent it terms of the company's corporate goals, and the other functional strategies (new product development and marketing strategies) accompanying it as part of the value chain to which they belong (Lynch, 2006). A supply chain strategy that is not internally integrated may not affect the supply chain on a short run, but will ultimately lead to collapse of the supply chain in terms of competing activities provided the management foresees and averts.

Cost leader supply chains focus on production (as mass production) and finance as important capabilities. While flexible manufacturing systems is the production system of choice for prospectors or differentiators. Prospectors or differentiators focus on marketing and research & development capability as the important capabilities (Miller and Roth, 1994; Miles and Snow, 1978). Innovator organizational strategy has been defined by Miller and Roth (1994).

2.1.1 Triple-A supply chain

According to Lee (2004), there are three very different qualities that every top performing supply chains possess. First, great supply chains are agile, that is, they quickly respond to short term changes in demand or supply, and handle external disruptions smoothly. Second, they adapt overtime to structural shifts in the market and evolution of strategies, and products. Third, they align the interests of all the firms in the supply network so that the chain's performance is collectively optimized when the companies maximize their interests. Lee (2004) proposed that only supply chains that are agile, adaptable, and aligned are capable of providing companies with sustainable competitive advantage. It is therefore essential to impart these attributes into every supply chain.

2.1.2 Supply chain integration

Integration determines the extent to which a company strategically collaborates with its supply chain partners (Flynn et al., 2010). Several theoretical propositions related to supply chain integration aspects of core company and its supply chain members by relating them with organizational strategy and organizational culture have been worked out by Singh & Sharma (2016).

2.2 External consistency

The core function of a company's supply chain is to connect the company to its supply chain partners and its customers in a manner aimed at fulfilling its corporate objectives. According to Tilles (1963), external environmental consistency involves formulating policies that make sense with what is going on outside a firm. Thus extrapolating it to supply chain strategy, SC strategy should be consistent with what is going on external to it including both the existing conditions such as government policies, customer trends, and also the environmental uncertainty. That is, environmental consistency must be maintained to attain environmental sustainability, and also, the interests of all the firms in the supply chain must be aligned (Linton et al., 2007; Tilles, 1963).

2.2.1 Environmental uncertainty

Environmental uncertainty considers factors such as competing supply chains, unforeseen government policies, product uncertainty, technological changes, supplier dynamics, varying customer preferences, etc. Uncertainties faced by a product (product uncertainties) can be broadly categorized into two types: demand uncertainty, and supply uncertainty (Lee, 2002). The demand uncertainty of the product can be related to the demand predictability, product life cycle, product variety, profit margins, etc. However, fundamentally, products can be classified based on their demand patterns as functional products, and innovative products (Lee, 2002). In general, functional products have long product life cycles, low product variety, and therefore stable demands, while innovative products have short life cycles with high innovation, high product variety, and have highly unpredictable demand as a result. Supply uncertainty, on the other hand is based on the nature of the supply process involved thereby can be characterized into stable and evolving (Lee, 2002).

2.3 Resources and capabilities of the supply chain

SC resources are used to build SC capability, flexibility and redundancy for the SC partners in their functional departments, viz., production, finance, marketing, and R&D to mitigate SC risk.

2.3.1 Resources of the supply chain

Any decision within an organization is limited by the resources it possesses, or might possess in the future. Similarly, resources of a supply chain are those assets that contribute to the generation of its value added (Lynch, 2006). Broadly resources can be categorized into tangible, intangible, and supply chain capabilities (Lynch, 2006). The strategic sense of resources is that they represent action potential which may not be uniform for all. Therefore, it is necessary to evaluate their importance with respect to the supply chain for which the VRIO framework (valuable, rare, imitable, and organizing capability of the supply chain) can be used (Lynch, 2006).

2.3.2 Supply chain flexibility

Flexibility of a supply chain determines its ability to respond to any change, and therefore is fundamental to a supply chain. Literature on flexibility identifies 22 dimensions of supply chain flexibility (Singh and Acharya, 2013). Unpublished work of Somen 2016 (Sharma et al., 2016) has identified 50 such dimensions & given a framework that relates supply chain strategy to flexibilities pursuit. Also literature is available on marketing, financial, human resource flexibility, & it can be argued that these functional flexibilities must be nurtured in synergy (Sharma et al., 2016).

2.4 Supply chain risk mitigation

Supply chain have been categorized into cost leader supply chain and differentiator or prospector supply chain (Mishra, 2016). Mishra (2016) suggested that cost leaders use buffering strategy (insulating from environment and focusing on part of low segment environment only). Cost leaders use inventory to meet risks. Differentiators use bridging strategy whereby they have deep contacts with suppliers, customers & stakeholders (Mishra, 2016). Unpublished work of Teklehaimanot and Sharma (2016) have categorized risks in accordance to strategies of supply chain (cost leaders, differentiators).

3. Supply Chain Strategy Implementation

Strategy implementation includes the structure, culture, organizational systems, and strategic decision making process of the supply chain all of which would pose risk upon choosing the most appropriate solution in compliance with the strategic typology of the supply chain. Therefore, extrapolating Schwartz and Davis (1981), each of the risks can be divided into acceptable, manageable, and unacceptable. The formulation of the supply chain strategy should involve the risks within the manageable domain for all the supply chain partners involved. The steps on how to approach is demonstrated under cultural attributes. These factors are an extension to supply chain and were originally collected from the strategy implementation literature of organization:

1. Structure of the supply chain
2. Cultural attributes of SC partners
3. Systems of the supply chain
    - SC management control system (MCS)
    - SC management information system (MIS)
    - Performance evaluation system
4. Strategic decision making process (SDMP) of SC partners

A brief description of these factors is given below:

3.1 Structure of the supply chain

Structure of a supply chain represents the underlying framework by which the supply chain partners are connected to each other. There is the aspect of distribution of power and bargaining between core company and suppliers. In cost leaders, core company has high bargaining power as compared to suppliers. While in differentiators, core company does not have much higher bargaining power than suppliers.

Structure of a supply chain can be evaluated in terms of its five dimensions: specialization, standardization, formalization, centralization, and complexity of workflow (Pugh et al., 1968). Further, based on the emphasis on its individual dimensions it can be classified into: mechanistic, organic, or matrix structure (Sharma et al., 2011). This structure which follows from the supply chain strategy should be compatible with the organizational strategic typology of the supply chain. That is, mechanistic structure of a supply chain fits with cost leaders, organic with innovators, and matrix with differentiators (Sharma et al., 2011).

Apart from this, the supply chain strategy must also ensure that the structure prescribed by it imparts adaptability to the supply chain (Lee, 2004).

3.2 Cultural attributes of the SC partners

Hofstede (1980) defined culture as the collective programming of the mind. No supply chain strategy can exactly fit in with the culture of the organization, and its vendors, although, the risk posed due to this deviation can be broken down into acceptable, unacceptable, and manageable risk Schwartz and Davis (1981). Therefore, the given supply chain strategy should ensure that the cultural deviations do not exceed the manageable cultural risk domain into unacceptable risk, for in that case, it will not be feasible.

Five dimensions of culture have been brought out in the literature, viz, power distance, uncertainty avoidance, individualism versus collectivism, long-term orientation versus short-term orientation, masculinity versus feminity (Hofstede, 1980). Other dimensions of culture are professional culture, bureaucratic culture, person support culture, market culture, adhocracy, clan culture (Cameron and Quinn, 1999).

Adapting from Schwartz and Davis (1981) the following steps are proposed to align the cultures of the organization and individual vendors:

a) Identify the relevant, and critical cultural aspects which are engraved in the culture of both the organization, and that of the individual vendors.
b) Prioritize these cultural aspects in the order of necessity of the entity whose cultural aspects are being

considered, with organizational culture being given the highest priority.

c) Group, and tag the cultural attributes which are similar in nature to the highest priority cultural attribute in each of the grouped lists.
d) Account for the maximum of groups in the order of priority.
e) Assess the risk that the cultures of each of the vendors, and the organization present after accounting by categorizing them into unacceptable risk, manageable risk, and negligible risk.
f) Focus on those aspects which pose an unacceptable risk, by altering the approach keeping the central theme constant, and bring them into manageable risk (Schwartz and Davis, 1981).

3.3 Systems of the supply chain

3.3.1 Supply chain management control system (MCS)

The supply chain management control is vital in ensuring the effective implementation of the supply chain strategy, and the manner in which this is done is regulated by the control system decided in the supply chain strategy through four levers of control: belief, boundary, diagnostic, and interactive (Simons, 1995). However, a management control system does not suit every organizational strategy type of the supply chain. In particular, it has been found that diagnostic control system suits cost leaders, and interactive system suits innovators, although there is no such system for differentiators (Sharma et al., 2008).

3.3.2 Supply chain management information system (MIS)

Issue of proprietary standards versus shared standards: Pioneers go for proprietary standards (Apple & Amazon) of Information Technology (IT) infrastructure (where supplier pay to use IT systems of core company); whereas late entrants (Samsung, Flipkart) use the shared standard (Xu, 2011).

Different communication architectures have been proposed: Point-to-point communication (recommended for small & medium enterprises (SMEs) where data traffic is low & XML based integration is proposed) and hub and spoke architecture is for a large number of suppliers of a core company (Xu, 2011). Major issue is "seamless" data integration (frequent rekeying-in of data should not be there).

Service Oriented Architecture and Multi agent systems (along with RFID) are some of the leading technologies emerging for managing supply chains (Steinfield et al., 2011).

3.3.3 Performance evaluation system

3.3.3.1 Supply chain operations reference model (SCOR)

Supply-Chain Operations Reference- model, or SCOR model is a process reference model that provides a medium to facilitate communication among supply-chain partners (Supply Chain Council, 2002). SCOR is based on five core processes of a supply chain namely, plan, source, make deliver, and return, which provide us with a valid perspective of supply chain strategy (Rose, 2012) maintaining consistency with the other factors discussed. SCOR metrics renders a comprehensive set from which necessary measures can be used to evaluate the performance of the supply chain based on its objectives, and strategic typology. For example, cost leaders use predominantly financial measures whereas innovators tend to use both financial and non-financial measures such as customer satisfaction for performance measurement (Sharma et al., 2008).

3.3.3.2 Balanced score card (BSC)

The balanced scorecard supplemented traditional financial measures with criteria that measured performance from three additional perspectives—those of customers, internal business processes, and learning and growth (Kaplan, 2007). Supply chain involves both customer and internal processes of the firm. Supply chain also entails financial expenditure. Most of the manufacturing industries are embedding service industries since manufacturing is moving towards system integration and outsourcing. For example, Tata Motors has designed and marketed Fully Built Vehicles Business but outsourced its manufacturing.

3.3 Strategy decision making process (SDMP) of SC partners

There are three strategy-making processes: rational, bold, and incremental/interaction (Miller, 1985). Rational strategy-making process involves using mathematical models like linear programming, simulation that are more successful in times of certainty. Incremental strategy-making process involves taking small steps when uncertainty is very high. Bold strategy-making process involves taking bold steps like setting up a production/manufacturing facility with huge capacity (Miller, 1985).

4. Theoretical Proposition

It is hypothesized that supply chain partners must possess similar strategies, systems, structure, culture, and strategic decision making process for maximum impact of the supply chain strategy, along with integration, alignment, and flexibility.

5. Conclusion

In a modern SC no one partner can be entrusted with framing a SC strategy, SC partners need to operate in a collaborative mode while framing SC strategy for its long-term sustainability. It is hoped that the framework presented here will address the issue of SC strategy formulation and implementation that has received little attention in literature.

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Biography

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