

Supply chain management as a competitive strategy for costs reduction: a case study in two small manufacturing companies

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Abstract

This paper presents the results of an investigation into the supply chain management (SCM) that was developed and implemented in two small manufacturing companies in Campo Limpo Paulista/BR. The goal was to provide conditions for strategic decision making to prioritize the implementation of SCM in small-sized companies and to achieve agility, flexibility, and lower costs for the operations system. The level of implementation of SCM in a small-sized company has fundamental performance flexibility and low cost. The results of the analysis and implementation of SCM by several small-sized companies in Brazil as well as the result of this work lead to companies achieving greater competitiveness in their particular market.

Keywords: Management of logistics costs, supply chain management, competitiveness

Introduction

When the increase in competition demands companies to be competitive. Through the search for management and productive innovations, companies will be able to identify their strong and weak points, making the attainment of competitive advantages possible. The competitiveness of micro and small businesses (MSB) also greatly depends on the persistence of the government, which would have to promote politics effectively directed towards its necessities.

In this context, it is down to the company to develop the ability to deal with scenes that are each time more dynamic in its sector of activity and logic and rationality can be applied successfully in the actions to resolve the problems that affect the supplies. It is well known that all transformation and services organizations that are involved in the stocking of products must be worried about the control of supplies, since they affect the result of the company in a very definite way.

The manufacturing industry is characterized by the increased number of MSBs and, additionally, by the great absorption of manpower. With the fall of the customs barriers, the

sector is facing an increase in competition. The present study, seeking to orient itself towards these concerns, aims to determine how much use is made of techniques of logistic management of materials in MSBs, based on the modern techniques of the management of supplies and the supply chain.

The logistic management of materials is a function necessary for stipulating the diverse levels of materials and products that organizations must keep, within economic parameters. Therefore, the main function of the administration of supplies, the strategic management of materials, is to maximize the use of the involved resources in the logistic area of the company, to great effect. The manager will encounter a terrible quandary, which is the cause of the inadequate management of materials, perceived in innumerable companies and, mainly, in MSB creating several problems regarding the necessities of capital for the company. On the other hand, companies seek to maintain a volume of materials and products in supply to take care of the market demand, as well as its variations, serving the supply as a lung and, on the other hand, aiming to minimize the expenses for some types of supplies, thus scrambling the investments in this sector.

When the supplies are raised, to take care of to the market demands fully, they cause the necessity for a high level of capital and produce high costs. However, if they are not adequately managed, the supplies can cause difficult costs in the face of delivery delays, planning of the productive process, customer dissatisfaction, and, ultimately, the loss of customers.

This work is the result of a research project that investigated the provision of supply chain management (SCM) with low costs for MSB. Developed and implemented within two companies in Campo Limpo Paulista/SP, the main objective of this study is to provide (Friis et al., 2004, Kotzab et al., 2006) the conditions to prioritize strategically the cost-related decisions in the implementation of the SCM in a MSB.

Review of the literature

The definition of supply chain management (SCM) of the Council of Supply Chain Management Professionals (CSCMP) from Grant et al. (2006, p. 15) is:

... the process of planning, implementation and efficient control and of low cost, the flow and storage of raw materials, finished supply in process, products and information related, since the point of origin until the consumption point, with the objective to take care of the requirements of the customers.

SCM is seen as the internal and external integration of enterprise processes with the customers and suppliers to create value for the customers (Cooper & Ellran, 1993; Cooper et al., 1997). It incorporates different requirements of implementation provided by the actors between the place of origin and the end point of consumption, but mainly refers to the vision of a single actor (Handfield, 2000; Lee & Billington, 1992; Nichols, 1999). The necessity to implement SCM mainly inside the MPE represents a factor of great changes for the competitiveness in current days.

Lambert et al. (2005, p. 25) reported that the implementation of SCM integrates the logistic functions incorporating the enterprise processes internal to and external to the companies. However, there is a lack of literature relative to the implementation of SCM, integrating the process of the competitive strategy for the MSB. Heusler (2004) identified some important implementations of factors and as the control could prioritize and apply these factors to implement SCM in the MSB. However, the work recognized this lack of literature and pointed

out that the quantitative empirical research must be extended, in place of qualitative research, to investigate the implementation of SCM in more companies.

Concerning the internal developed conditions specific to the implementation of SCM of MSBs and the results of an implementation and its tools of ordinance derived from the theoretical concepts of Johnson and Gustafsson (2000) and Heusler (2004) showed that they help the managers of companies to determine the influential internal factors that affect the implementation of SCM in MSBs. The tool is an application of the analysis of importance performance of Johnson and Gustafsson (2000) and can be used to evaluate the current degree of implementation of SCM within an MPE and to provide priorities for the implementation variable to increase the degree of success.

The coordinating activities search for synchronism throughout the chain, in accordance with Lee's (1997) shares of information. The differentiation activities are those that concern the adjustment of the structure and participation in the chain facade and the ability that they intend to keep or to develop. They are the coordinating activities of the allotment of information and joint planning (Bowersox & Closs, 2001) and those that distinguish the board of the SCM in relation to other. Given its focus on the coordination and integration of activities related to the flow of products, services, and information between the different links, it not only allows companies to know the chain as a whole, but also points out management tools to the companies. Harland et al. (2001) stated that they appear with a basic distinction: SCM tends to concentrate on the analysis, simple and linear, of flows of materials and associated information.

The main characteristics of SCM include relations of long-stated periods between the main actors of the supply chain, with orientation for the final customer, mutual benefits, and the sharing of the information, profits, and risks (Arlbjom, 2002). Kopczak and Johnsons (2003) define this action as the supply chain cause and effect that provides a mutual competitive advantage. This effect can allow an increase of the competitiveness of a company or the organizational effectiveness relative to the competitors by reducing the costs and increasing the profits and the customer satisfaction (Bronzei, 2002; Elmuti, 2002; Wisner, 2003).

Finally, as the end of this research, the theory of supply chains is understood as an intentional strategy of organizations that seeks to generate competitive advantages throughout the net, by means of the delivery of superior value to the final customer and on the basis of contribution relationships (Harland, Lamming, & Cousins, 1999).

A basic problem concerns the identification of the passage of SCM and the interlacement of the chain. Ganeshan et al. (1999) limited the extension of a supply chain to the activities interconnected with the planning, coordinating, and controlling of material, WIP, and finished products from the supplier to the final consumer, considering as such only two distinct flows – material and information – through the organization. They also highlighted the problem of responsibility, that is, who is responsible for the supply chain? This problem, concerning who has the real control of the supply chain, is important for determining all the influences that it can have on any company throughout the supply chain (Grant, 2005).

Croxton et al. (2001) examined the importance of SCM in organizational processes and differentiated the processes of strategic and operational SCM. Both the types appeal to the processes that internally interconnect the organizations of a net. The model was built upon the prerequisite of relationship orientation that serves as a driver to connect the business processes between a minimum of three organizations.

Min and Mentzer (2004) developed and measured different concepts of SCM based on the constructs of SCM and supply chain orientation (SCO). While SCO involves certain implications of the management and some flows being implemented within a company, SCM concerns the

coordination between the traditional functions of the business and the tactics throughout the supply chain. The reason why companies would have to look both ways is to improve their performance, measured by its offered growth, yield, availability, opportunities, products, and services.

In accordance with Christopher (1997), logistics management can provide some steps to increase productivity and efficiency, which would have as a direct consequence the reduction of the unitary costs, reflected in the general performance of the company. Lambert et al. (2005), on the other hand, compared the different structures of SCM to be able to identify how SCM can be implemented in a company. Implementation, simply, refers to its integration into the established enterprise processes so that it leads to a strong increment of the aggregate value.

To increase the competitiveness of small companies, a viable alternative has been cooperation between companies of the same branch of activity, within the same industry; one of these cases is the pharmaceutical retail sector. According to Kotler and Armstrong (1998), the great success of corporate chains encouraged many independent stores to form retail cooperatives. The same authors stated that in this type of association, a group of independent retailers joins to establish a central office of purchases and to carry out *merchandising* promotions as a set. Complementarily, the association makes it possible for the independent stores to make economies of purchases and promotion, allowing one better condition of competition with the great corporate nets.

The formation of nets of small companies makes it possible for them to use the structure of the net, if located strategically in the market, for example, in one of the three generic strategies supported by Porter (1985):

- Leadership in cost; Differentiation; Approach.

According to Ghemawat (2000), these are not mutually exclusive in this direction, the company can acquire a competitive advantage more than if benefiting from its positioning in the market.

The formation of these nets has also contributed to the business-oriented environment, allowing more capacity of competition to the participant companies, consequently promoting more services and offering qualified products and economy in costs for the customer. According to Lorange and Roos (1996), strategic alliances appear in different types of organizations, which start to see in the cooperation an important way to increase their competitiveness through the sharing of information, technology, resources, opportunities, and mainly risks.

As Lewis (1992) stated, companies of the same branch possess the same types of products, marketing activities of purchase, interests, operations, and technologies. These similarities create more chances for cooperation between companies of distinct sectors. The cooperation between companies allows them to gain better access to resources and better coverage of the market.

The relevance to the subject in the present work stems from the fact that in Brazil 98% of organizations are micro and small companies (IBGE, 2008). While multinationals, conglomerates, and companies of great transport are reducing their participation among the total number of people active in the different economic sectors, the micro and small companies (MPEs) are tending to increase their relative participation. Some results obtained for the research are also connected to waiting to gain according to the neo-Schumpeterian evolutionist approach. .

Methodology

The method followed in this research is the case study, which is described by Yin (2001) as a method to be used in situations in which excellent behaviors cannot be manipulated, but in which it is possible to make direct comments and undertake systematic interviews. The case study is characterized by the capacity to deal with a complete variety of evidence, such as documents, interviews, devices, and comments. As Gil (1999) stated, the case study is characterized by the deep and exhausting study of one or a few objects, in a way that allows its relations between variable to constitute steps of the establishment of the theoretical landmark or conceptual system of the research. Therefore, it becomes necessary to collate the theoretical positioning of the problem with the data of the reality and, thus, to define the delineation of the research.

The instruments used in the research were comments made in two small companies in Campo Limpo Paulista/BR, with structured interviews and analysis of company reports. The interviews were elaborated from six attributes verified by the theoretical base (Feldon & Maçada, 2003) that assisted in formulating the questions.

The sample is composed of two MSB of important segments of the productive chain of the region: a company from the mechanical industrial branch and another from the industrial plastic branch. In each one of these companies, the owners and those responsible for the area of were interviewed regarding the *supply chain*. The research instrument was submitted to the main elements of the companies, in visits carried out regarding its respective dependences. The answers were obtained through interviews, the analysis of reports, and email.

The results were analyzed with the objective of identifying the impact of SCM and of logistics as the following variable presented in Figure 1, below.

Figure 1. Three important variables and their impact on SCM

Variable Organizational	Impact of SCM in Strategic Variables	Authors impact on SCM in MSEs
Costs	High investments in automotive and technology can reduce the cost per unit of production, achieve economies of scale by utilization of machinery, space, energy and skilled labor more efficiently and improve the balance between standardization and flexibility of processes in organizations.	Jimenez-Martinez and Polo-Redondo, (2002); Patterson et al., (2003); Kelle and Akbulut.
Competitive edge	The utilization of SCM enables enterprises to respond faster to changes, greater flexibility of operation and possibility of creation of new products and services.	Bergeron and Raymond, (1992); Jimenez-Martinez and Polo-Redondo, (2002); Yen and Scheu, (2004).
Integration and flexibility	The action integrated operations allows companies to share information and resources, efforts to eliminate, adjustments in logistics and distribution.	Lim and Palvia, 2001; Jimenez-Martinez e Polo-Redondo, (2002); Patterson et al., (2003); Kelle na Abkulut (2005). Stank et al., (1999); Levary (2000), Yen and Scheu, (2004).

Source: adaptation of the authors

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The facts that all the arguments and sample have in common are the strategic importance of SCM and its aspect of integration of different flows and processes directed toward the total orientation for the customer with raised value generation. All these factors provide values to help organizations to become more competitive in terms of making more with less, or at lower costs.

The SCM implantation appeals, then, to a degree of internal and external integration of supplying, transforming enterprise processes, and involving customers. In addition it can be perceived that some influential factors that affect the SCM implantation depend on the perfect domain of concepts of the strategic administration for adequacy of the changes of the process. This implantation is also dependent on the correct identification of all the partners composing the supply chain and they are crucial for the total integration of the process.

The integration of the chain presents evidence, established while researching a case study in Campo Limpo Paulista/SP, that the implementation and internal integration must take priority and need a specific ability in SCM to fix the basic and necessary requirements for posterior external integration. In Figure 2, below, four important qualifications are presented that had been developed for the implantation of the SCM model in the two companies.

Figure 2. Qualification to be developed in the context of the supply chain

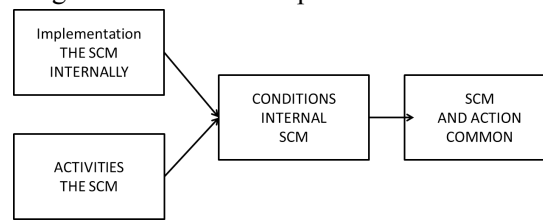
Regulatory training: survey of legal entities, property rights and copyrights, patents, trademarks, contracts, licenses, operations and systems of owners of information and database.	Training placement: development assets: reputation of the company or product, value chain configuration, network logistics (supply and distribution), complexity of the structure of decision systems installed for operation and circulation of information (ERP, EDI) and research market.
Functional training: individual qualification and or teams, knowledge of "how to" knowledge diffusion and absorption of knowledge.	Cultural training: organizational characteristics, perception of quality standards to be disseminated. Ability of companies to manage changes, adopt innovations, assemble work teams, responding to challenges and set standard of services.

Source: authors

Heusler (2004) stated that the resources for the implantation must be based on models with the perspective facade in the bases of the supply chain and mainly determine a change of ability for the implementation of this process in terms of the resources and information. The main notion of Heusler is that a company that desires to implement the necessary SCM must have the ability to achieve the specific implementation. It also appeals to the necessity of a specific actor in the chain to initiate the implementation of SCM.

This model was tested in two small companies in Campo Limpo Paulista using an empirical research instrument that contains four main factors, as shown in Figure 3, below: 1) the implantation of SCM inside the company; 2) SCM and the activities; 3) SCM and the internal conditions; and 4) SCM and the conditions in common with the partners. The factors of the SCM and the internal conditions and those in common are considered antecedents for the factors of SCM and the activities that the degree of implantation of the SCM in a company affects directly.

Figure 3. Factors of implementation of SCM



Source: authors

Integrated management is a characteristic of SCM and must be considered as an expanded vision, brought up to date, and overall holistic of the traditional administration of materials, encompassing the management of the entire productive chain of a strategically and integrated form. The definition of its competitive and functional strategies through its positioning of the productive chains was based within the two companies. The objective of SCM is to control the total cost, to improve the quality, to maximize the gamma of services to the consumer, and, thus, to extend the profit. The companies had perceived that the result obtained through one set of appointments regarding improvements and qualification resulted in a productive structure with an ability that was distinct and very difficult for the competition to fight.

The companies had started to diminish the lead time and had provided the conditions to increase the flexibility of the suppliers in taking decisions immediately after the moment at which the demand occurs. The level of service to the customer concerns the supply to utility of time and place, making it possible that if it is carried out through a process of exchange between a purchaser and a salesman it can start to be more efficient. The products had started to arrive in the hands of the consumers within the stated period and waiting time, thus increasing the value perceived by the customer; therefore, the utility of a product is tied to its availability and accessibility.

The strategic alliances in the supply chain provide successful partnerships, such as creating new products and services within an enterprise; forming alliances and synchronizing supply and demand; developing creative answers to the increasing demand of the customers for quality, rapidity, and convenience; generating new sources of profit and entering new markets with acceptable levels of risk; elaborating partnerships of the type *gain-it earns* and not only interchange of services; using the research to anticipate and to exceed the resistance of potential partners; and transforming the *know how* of the company regarding new products based on the information available and the market requirements.

The results obtained with the successful partnerships in the SCM had been the fortification of the relationship of the companies in order to reach a competitive advantage. For any cooperation to achieve success in the market, it is necessary to act in accordance with each joint party if it compromises its abilities with a series of basic daily pay conditions and established techniques, in such a way that the quality of the service is satisfied.

The related strategic alliances in the supply chain had been based on aspects argued and evaluated as the contribution in favor of the partners in the increment of the productivity and profitability of the companies. The aggregate value of the product, facilitation of access to the market, fortification of the operations, increment of the technological qualification, magnifying of the strategic target of performance, increase in the organizational abilities, and magnifying of the financial capacity were achieved for the two companies.

The sharing of the information that had assisted throughout the integration of the chain assisted the suppliers more in carrying out their operations based on more efficient planning.

Thus, regarding the measure that the edges had become narrower each time and the satisfaction of the customer had extended its importance, it is sensible to develop efforts of cooperation between suppliers so that the final consumer, through the retailers, can have based knowledge and raised final knowledge. Therefore, the interchange of information between all the kinds of partnership is a primordial factor for the attainment of success, which leads to the obligation to adopt advanced systems of information.

All this procedure must, also, search for forms of cost reduction in the set of actions that composes the SCM, and Cooke in Queiroz and Cruz (1999) lists ten actions that companies must take to diminish the costs in the SCM, which the two companies of the study had used. Figure 4 below shows the recommended actions.

Figure 4. Actions that companies must take to diminish the costs in the SCM

1	Develop or enhance programs such as Vendor Managed Inventory and JIT to gain speed and standardize inventory orders.
2	Using Electronic Data Interchange (EDI), internet, to reduce the cost of transaction and cycle time.
3	Using the new tools of prediction and planning to centralize this information.
4	Producing under a production schedule that aims to optimize the balance-profit, the service consumer, the utilization of resources and capacity utilization through software optimization.
5	Constantly review the cost of building an inventory against the cost of production capacity in order.
6	Condense the supply chain substituting producers and distributors to be closest to market.
7	Integrated production, inventory planning, customer service, distribution and transportation functions to improve the feasibility of information, reduction of inventory and improved service.
8	Identify and fix non-profit and consumer product lines to increase margins and eliminate businesses.
9	Assess the feasibility of outsourcing all or parts of your SC. Using external experts when they can make your company save money.
10	Centralizing support functions of SC, such as buying offices to gain economies of scale, downsize and reduce transaction costs.

Source: Cooke in Queiroz and Cruz (1999)

With regard to MSB, the advantage is the restricted locality, that is, the storage system starts to become more dynamic and involve specific places of delivery. In this direction, it can be distinguished that the problems of the localization of warehouses do not only have to be analyzed as if they were a transport problem; therefore, in the storing activity an economy of scale exists associated with the cost of storage. Ballou (2001) reported that the relative decisions on the localization of fixed structures fit into the process of planning of the supply chain.

The basic processes of the SCM represent in a grouped way the necessary activities so that the biggest objective of the logistic process is reached, which is to offer products and services adjusted to the moment and the certain time, and necessarily to the cost considered correct. These activities concern the entire supply chain and can be expressed as equation 1, below:

$$\text{CTL} = \text{CE} + \text{CP} + \text{CPP} + \text{HERE} + \text{CT} + \text{CI} \quad (1)$$

where:

CTL = Total cost of the logistics activities

CE = Cost of supply

CP = Cost of production

CPP = Cost of the processing of orders

CS = Cost of storage
 CT = Cost of transport
 CI = Cost of inputs

The components of this equation are citizens, the certain conditions that make it difficult to achieve the efficient management of the costs of supply chains. This total cost must be minimized, taking care of the level of service defined for the company, on the basis of the requirements of the final customer. The other costs are vectors that affect the distribution canals and are considered indirect. They derive the external activities of the company, called intermediates, and assume part of the risks and the resultant costs of the supply chain.

Figure 5. Comparative degree of the impacts in the examined companies

Task Retail	Tasks in collaboration	Tasks industry
Strategy and Planning		
Vendor Management	Type collaborative arrangements	Account planning
Category Management	Business plan set	Planning Marketplace
Management of supply and demand		
Forecast POV	Sales Forecast	Market Data Analysis
Planning resupply	Forecast / Planning application	Demand planning
Execution		
Shopping / repurchase of products	Generation request	Supply and production planning
Logistics and distribution	Order fulfillment	Logistics and distribution
Analysis		
Execution in store	Exception management	Monitor implementation
Evaluate vendor (score card)	Performance Evaluation	Assess client (scorecard)

Source: data from the research

The use of these indirect canals can facilitate the flow of the products; therefore, these have the condition of congregating some products of different manufacturers, normally in great volumes, and placing them at the disposal of the consumers, who in the majority of times purchase small volumes, but some products and this activity of the supply canal are of vital importance. To follow, Figure 5, below, depicts the comparative degree of the resultant impacts of the implantation of the SCM in the two MSB of Campo Limpo Paulista with regard to the factors of the reduction of costs, the integration of the supply chain, agility, and management.

Conclusions

The data of the studied companies disclose that after the implantation of the new process the operational costs reduced and they became more competitive with their competitors and partners in the productive chain, since the managers started to acquire improved visibility of their business and a sensible improvement in the time of reply to the demands, leading to the best profit margins.

It can be concluded that SCM, in these studied companies, receives a strong impact from the supply chain, bringing benefits and modifying the form of the company's actions. The costs that involve the supply chain and the total logistic cost must be controlled with accuracy; therefore, they make the great differential in the full attendance to the customer and the total satisfaction.

The limitation is the difficulty of locating more complete data on all the companies operating in the state of São Paulo.

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