Strategic management of logistics and supply chain: 
a case of increasing and fostering the competitiveness of a TNC subsidiary in Brazil

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Abstract
Recently, competition has increased significantly in all industrialized parts of the world and the requirements of striving in a global scope has become imperative in many industries. Consequently, most companies operating in high-competitive markets, has been continually challenged to respond effectively to this new competitive reality. Among the other options, improvements in supply chain management and logistics have been one the more frequent and useful ways pursued by companies interested in increasing and fostering competitiveness. This article highlights the strategic aspects of logistics and supply chain management and presents some relevant points of a successful case of transformations and improvements performed in the area. The case was conducted by a subsidiary of a TNC operating in Brazil and was guided by a certification process emitted by a reputed international consulting company.

Keywords: Logistics, Supply Chain Management, Manufacturing Strategy, Certification Process, Case Study

1. Introduction
During the last decade, with the so-called globalization economic process, competition has increased significantly in all industrialized parts of the world and the requirements of striving in a global scope has become imperative in many industries. As consequence, most companies operating in high-competitive markets, such most TNC’s (Trans National Companies) running worldwide, has been continually challenged to respond effectively to this new competitive reality. In Brazil, the efforts and adaptations has been more clearly visible in the companies already established in the global context of competitiveness, such as the so-called world-class manufacturing (FLEURY, 1995).

Recently, among the menu of options, transformations and improvements in supply chain management and logistics have been one the more frequent and useful ways followed by companies interested in increasing competitiveness.

The main purpose of this article is to highlight the strategic aspects of logistics and supply chain management concepts and presents some relevant points of a successful case of transformations and improvements in the area and conducted in a TNC operating in Brazil. In following, some relevant aspects, from the strategic perspective, of Logistics and Supply Chain management are presented and discussed.

2. The strategic role of Logistics and Supply Chain Management
Logistics and Supply Chain Management have emerged recently as an area of great interest and have leveraged the competitive advantage of many leader companies worldwide. Besides this, it is still frequent some confusions and misunderstandings regarding the logistics and supply chain
management concepts. In following this article will deal with this subject and with the current strategic role they have performed in the business environment.

2.1. Logistics

Although originated and very usual in the war context, Logistics is a traditional area of interest in the production management. According to BOWERSOX & CLOSS (1986), Logistics involves the information integration, the transport, the inventory, the warehouses, and the handling and packing equipment. STOCK et al. (1998) pointed out that Logistics has traditionally been defined as the process of planning, implementing and controlling the efficient flow and storage of goods, services and related information from the point of origin to the point of consumption. It is important to note that the focus of this definition is the individual firm, embracing traditional activities such as purchasing, transportation, warehousing, handling and distribution.

More recently, many manufacturing companies have made efforts in order to integrate and synchronize the execution of its logistics processes. Generally these logistics processes are divided in three distinctive scope of conduction (inbound, internal and outbound) and frequently are called by integrated Logistics. The Figure 1 illustrates the current scope of Logistics in manufacturing companies.

![Figure 1: Scope of Logistics in manufacturing companies](image)

2.2. Supply Chain Management

During the last years, Supply Chain Management (SCM) has attracted many attention of both academic and business environment. Sometimes the concept has been understood as synonym of Logistics what is not true, because the scope of SCM is clearly wider than Logistics. Leader corporations implementing state-of-the-art SCM understand that it encompasses more than Logistics, that is, SCM partnerships likely involve more processes and functions than integrated logistics management. In fact, SCM embraces new practices, such as ESI (Early Supplier Involvement), and new systems, such as CRM (Customer Relationship Management), which go clearly beyond the natural scope of Logistics illustrated by the Figure 1.

SCM is a contemporary, and basically a strategic approach for managing all the manufacturing, and has recently brought interesting innovations in most industries, worldwide. It is possible to state that SCM deals with the holistic integration of the business process through the demand/ productive chain with the purpose of attending the final customer more effectively. Many leader companies in SCM performance have maximized the synergy between all the elements of the demand chain, either by reducing costs or by enhancing value to the products. In order to reach this purpose, many companies have search to align and join distinctive competencies in the entire demand chain (PIRES, 1998).

Effective practices in SCM have been implemented worldwide in an attempt to simplify and improve supply chain efficiency. Positive results have been attained by:

- Restructuring and consolidating the supplier and customer base. This generally means reducing the number of and deepening the relationship with the set of companies willing to develop a partnership with a synergetic result. For example, the Modular Consortium implemented by Volkswagen and seven module suppliers at its new truck and bus chassis plant in Resende, Brazil, has quickly become
a point of reference for radical outsourcing with a major restructuring and consolidation of the supply chain (COLLINS et al., 1997; PIRES, 1998);

• Sharing information and integrating infrastructure with customers and suppliers. This makes it possible to obtain just-in-time and just-in-sequence deliveries and decrease inventory levels using systems such as EDI (Electronic Data Interchange) and ECR (Efficient Consumer Response) among suppliers, customers, and logistic operators. The practice of maintaining in-plant representatives inside the customer’s facilities has allowed a better balance between the customer’s needs and the supplier’s production planning;

• Providing joint solutions to problems and the involvement of the suppliers from the beginning of the development of new products, i.e., using practices such as ESI (Early Supplier Involvement);

• Matching the company's competitive strategy and general performance with the reality and objectives of the entire supply chain.

It is important to note that all the new practices in SCM has been implemented in a competitive context characterized mainly by the consolidation of a globalized economy, and the existence of a new set of competitive needs, which have introduced new barriers and standards for competition (for example, customized products, environmental constraints, fast development, obsolescence and delivery of new products, demands for higher quality simultaneously with lower price, etc.). This context has demanded a clear definition of company focus and priorities, as well as the development and maintenance of distinctive competencies within the product demand chain (PIRES, 1998).

2.3. Strategic Management

The high level of competitiveness and turbulence predominant today within the business environment has increased significantly the importance of managing all kinds of organizations from a strategic perspective.

Since the beginning of the 1980’s many manufacturing companies have been running based on the model that stipulates three basic levels of strategy in a corporation operating in the manufacturing industry, that is, the corporate strategy, the competitive strategy and the functional strategies.

From the manufacturing point of view, the corporate strategy has been usually focused on subjects such as business diversification, business profitability, business viability and business synergies within the corporation. On the competitive level, frequently companies have used the concept of competitive advantage proposed by PORTER (1980) focused on the competition among individual business units. The two basic and mutually excluding strategies proposed were cost leadership and differentiation. According to PORTER (1980) the companies would avoid to practice simultaneously both approaches in the same business, in order to avoid become stuck-in-the-middle.

On the lower level is positioned the called functional strategies (such as manufacturing, finance, marketing, research and development), where the interest of this article is concentrated on the manufacturing strategy. The concept of manufacturing strategy is relatively new and represents an area which has received much attention in recent years. This interest is reflected in the amount of published research, especially empirical studies (SWINK & WAY, 1995). However, there are some neglected themes in the area, such as manufacturing strategies in developing countries and emergent economies is a subject which has been little explored. Following this article will explore better the Manufacturing Strategy concept.

2.3.1. Manufacturing Strategy

The origin of the concept of manufacturing strategy is frequently attributed to Skinner’s pioneer article (SKINNER, 1969) which pointed to the neglect of the role of manufacturing in enterprise competitiveness and the missing connection between manufacturing and the corporate strategy.

Manufacturing strategy is usually defined in a complementary way, dealing with the development and deployment of manufacturing capabilities in total alignment with the objectives and strategies of the whole enterprise, therefore making effective use of manufacturing as a powerful weapon in company competitiveness.
The literature on manufacturing strategy includes both theoretical and empirical studies, and is usually divided into "process" and "content". "Content" refers to the strategic types and strategic choices and performance, and includes competitive priorities, process design (structure), and infrastructure. "Process" refers to the formulation and implementation of strategic decisions.

The basic elements of a manufacturing strategy are the competitive priorities, which are defined as a consistent set of priorities chosen from among the manufacturing capabilities, with the purpose of making design and manufacturing operations decisions. Also, it is important to note that competitive priorities are a term restricted to manufacturing function, different from the competitive strategy commented before, which is generally performed at the level of business unit.

Most of the related literature condenses competitive priorities into four major elements: lower cost, quality, delivery performance, and flexibility. Lower cost is the most traditional priority and consists of pursuing an overall reduction in manufacturing costs, allowing the company to compete on the basis of lower prices. Quality is a priority which has received a lot of attention in recent years, and consists of manufacturing products with recognized high quality. Delivery performance contains two basic dimensions: speed and dependability. Flexibility is related to the manufacturing capacity to quickly react and adjust to changes, especially to fluctuations in the mix and volume demand. In spite of growing interest, the theoretical research regarding manufacturing competitive priorities still has some gaps, such as the lack of a consensus about the existence of trade-offs among the priorities, and about a more generalized, global model of their implementation. Even so, some important contributions have been made. SKINNER (1985) suggests allocating weights to each priority, creating a ranking which depends on the company’s corporate and competitive strategy as a whole. BOLWIJN & KUMPE (1990) propose a cumulative process, linked with the evolution of marketing requirements since the 1960s, and resulting in the sequence: cost, quality, flexibility and innovativeness, concluding that it is "difficult, if not impossible, to skip a phase". FERDOWS & DE MEYER (1990) reject the traditional idea of trade-offs using the data extracted from a large empirical research project in companies operating in Europe, Japan and the USA. They observed that some companies were able to achieve good performance in several priorities simultaneously, and in some cases in all of them; quality programs brought cost reduction, and improvements in delivery performance increased flexibility. The authors explain the data by proposing a model called the "sandcone model", where the "sand" is the various programs conducted, and the "cone" is the manufacturing capabilities being accumulated. In their model, the sequence for building up the cone is quality, delivery performance, flexibility and cost.

The set of models based on the accumulation of capabilities is in agreement with the idea of qualifiers and order-winning criteria formalized by HILL (1989), considering that in a free (or ideal) marketplace, some manufacturing capabilities serve to qualify the company for competition, while others are responsible for sales.

2.4. Logistics, SCM and Strategy

From the brief review and discussion about Logistics and SCM provided before, it was possible to understand the scope of both along the productive chain, that is along an hypothetical horizontal line in the space. On the other hand, the strategy concepts presented followed an hierarchical structure, i.e., along an hypothetical vertical line.

In an attempt to link the concepts, it is necessary to highlight the current wider scope of Logistics and SCM concerning the three level of strategies presented. In other words, presently and in the future, the scope of Logistics and SCM needs to be understood always from a strategic perspective. This position is also shared with other authors such as STOCK et al. (1998) that remember that, in the past, Logistics had been considered a narrowly-defined functional activity concerned with tasks such as transportation, warehousing, inventory and materials management. These authors also pointed out that "as firms become less and less hierarchical, as they become more and more geographically dispersed, and as customers become more and more demanding, Logistics can provide a coordinating role that will provide a firm with a competitive advantage".

In this direction, SCM has clearly a wider strategic scope and is based on a competitive model that is different from the classic "competition among business units" proposed by PORTER (1980). From the
SCM perspective, competition is currently being focused on productive chains, instead of on companies, what means a change of competitive model from the conventional “business unit” to a “virtual business unit” model. This “virtual enterprise” aims to get many of the benefits of vertical integration without the its traditional losses in cost and flexibility (VOLLMANN & CORDON, 1996). It is important to remember that the basic objective of SCM is to maximize the synergy between all of the parts of the demand chain, either by reducing costs or by enhancing value to the products, without becoming stuck-in-the-middle as suggests the already discussed model proposed by PORTER (1980). The Figure 2 illustrates the scope of SCM and Logistics concerning the three common level of strategies discussed.

![Figure 2: SCM and Logistics scope relatively to the three strategy levels](image)

Another interesting present example of the strategic role of SCM is promoted by the “insource or outsource” decision-making process, which has emerged as a strategic and wider approach to replace the old “make or buy” process of an individual company. Insource or outsource decision-making come out as a strategic and multi-criteria process which considers all the SCM implications of the “virtual business unit”. An “insourcing” decision means producing a set of goods and services internally, which were formerly provided by one or more suppliers. On the other hand, “outsourcing” is a practice where part of set of goods and services used in the supply chain is provided by another company. The supplier develops and continually improves the competencies and infrastructure to provide this set, and the customer no longer has these infrastructures and competencies. Also, from the SCM perspective, it is important to differentiate outsourcing of subcontracting. Traditionally, subcontracting consists of an operational decision where parts and components (or services) are supplied by a specific company (or companies) in order to solve scheduling problems (such as a seasonal overload), or to support day-to-day activities of the plant (such as restaurant, employee transportation, medical services, etc.). Subcontracting is only a business relationship, not a partnership between companies.

In following, this article will present a real and successful case of increasing and fostering of a company competitiveness from the perspective of the Logistics and SCM processes.

### 3. A case of increasing and fostering the competitiveness of a company by the Logistics and SCM processes

This part of the article will presents a real case of transformations and improvements been strategically conducted by a leader company in Brazil, which is using and adjusting concepts, practices, systems, etc., inside the Logistics and SCM scope.

#### 3.1. The company and the motivation to certification

The considered company is a subsidiary of a TNC which has being operating in Brazil since 1954 as a traditional market leader in machines to movement materials in the construction, mining, agriculture,
forest, and manufacturing industry. Currently the company manufactures 5 product lines, with 21 basic models and 30 distinctive configurations.

In Brazil the company operates with only one plant located in the São Paulo state, with an annual revenue of US $ 500 millions, ranking among the 20 greatest exporters of the country, and exporting approximately 70% of its production, in manufactured volume. Also, among the 60 plants of the TNC operating worldwide, the Brazilian factory is that one which produces the largest variability of products and is one of the 20 TNC's plants with capability to operate entirely the manufacturing cycle by machining, welding and assembling processes.

In Brazil is the subsidiary with the highest level of dependency of importation among all the units of the TNC worldwide. In the Brazilian plant, approximately from 40 to 45 % of the components are imported, while in theirs plants in the USA the average is 5%. Currently, the plant has 110 suppliers located in Brazil. The USA suppliers are responsible for 85 % of its importation volume. During the last years, the priority of the company is to buy of local suppliers and many efforts have been dedicated to improve its inbound logistics. However, there is still a series of drawbacks related to the lack of technology and /or to the lower production scale of the suppliers which needs to be solved.

Aware of the strategic role of the logistics processes regarding its competitiveness, in 1996 the company decided to start a series of programs in order to conduct improvements in the logistics area. Since that time, the company has been working with the Oliver Wight Co. aiming, in a first stage, to reach the standard of a Manufacturing Resource Planning (MRP II) "Class A" from the logistics processes perspective.

3.2. The certification methodology basis

In order to avoid confusion, is important to note that to have an "Class A" certificate in MRP II do not means to pursue a certificate of excellence in the well-know family of software focused on the execution of production planning and control activities. The Oliver Wight MRP II "Class A" is a wider certification methodology which has been developed and implemented since 1969 in many industries. In all the world there are 200 companies certified as "Class A" in MRP II. The methodology considers that a business can be managed by the perspective of five basic processes: strategic planning, people and teams work, total quality management and continuous improvements, new product development and management, and planning and control. Also, to deal with the five basic processes the methodology stipulates integration, dependability, agility and flexibility, and people compromising as the basic four dimensions. This basis of the used methodology is illustrated in the Table 1.

The company decided then to implement the certification process by the planning and control perspective, because its matched better with the demands to improvements in logistics. As main result the company expected to develop an synchronized and disciplined environment where each element of the logistics chain should have a defined role and performs it consistently and according to the world class standards.

<table>
<thead>
<tr>
<th>Basic Process</th>
<th>Basic Dimension</th>
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<tr>
<td>Strategic Planning</td>
<td>Integration</td>
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<td>People and Teams Work</td>
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<td>Total Quality Management and Continuous Improvements</td>
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<tr>
<td>New Product Development and Management</td>
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<tr>
<td>Planning and Control</td>
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Table 1: The basis of the certification methodology and the process adopted as reference
3.3. The certification process and the improvements

The process started with a first diagnostic in 1996 which concluded was "E Class" the level of the company performance and, pointed out some key points to be faced in the conduction of the certification process.

In 1998 the company reached general level of B class, although some processes had already performance of an A class certified company. Finally, in April of 1999, after 30 months of continuous work and collective efforts, 18,000 hours spent with training (including suppliers of components and services) and investments of US$ 5 millions in systems (software) and training programs, the company reached the aimed certification and become the first company operating in Brazil to get this certificate, and the third plant inside the corporation to be recognized like MRP II Class A.

One of the first consequences of the certification process was the concentration of all the logistics processes in just one sector, with a significant restructuring in the entire logistics chain in terms of organization and infrastructure. The suppliers base was restructured (from 400 in 1997 to 110 currently) and programs with them were started with the purpose of leveraging the results of the partnerships. Additionally, dedicated systems to planning, controlling and interchanging of information with sectors of the plant and the TNC and with the set of key suppliers was implemented. All the operational procedures to deal with the raw material and components and the modal transport system were revised. The port used to put components on board in the USA was changed and the transport from Santos to the plant was rationalized. A better integration among the logistics operators working for the company was promoted with a significant decrease in terms of time spent, that is, jumping from three to one day to carry out the transport. In another front, the company also deal with the bureaucracy inherent to the importation process, creating two warehouses inside the plant which are operating according to the special rules permitted by the Brazilian government to increase the agility in the liberation of imported components.

3.4. The results of the certification process

The certification process provided a series of improvements in the company. Some relevant data are listed in following:

- Decrease of 52% in the time required to delivery the products to the customers, that is, the time spent from the receipt of the demand until the product delivery together the customers;

- Increase of the number of products delivered according to the due date contracted by the customers, jumping from the 60 - 65% practiced in 1996 to the current 98 - 100%;

- Decrease of all the inventory levels, with a sensible but not yet measured increase in the turnover;

- Increase of the inventory accuracy to a level of 95 %;

- Significant improvements and integration in the sales and operations processes, promoting better responses to market oscillations;

- Development of a new and collaborative relationship with the suppliers, resulting in 95% in the level of punctuality and quality of components;

- Better organizational environment and more involvement and compromising of employees in the company competitiveness;

- Opening of new markets and decision of the TNC in producing inside the plant new products.

During the last months, company has also been engaged in another certification process promoted by the Oliver Wight Co. labeled of Operational Excellence. The basis of this new certification is become the company a continuous learning organization, maintaining and expanding the experience and going beyond the limits of the former successful certification.
4. Final remarks

It is increasing every day the number of companies realizing the need and importance of leveraging its competitiveness by improvements in the Logistics and SCM processes. At the same time, have increased significantly the understanding and the consensus regarding the strategic role of both Logistics and SCM in the manufacturing management. Many leader companies, such as that one treated in this paper, already well know what this means and many customers, employees and stockholders are very grateful.

References


