Supply Chain Management: An Empirical Study in Brazil

S.R.I. Pires and S.A. Rodrigues.

The Methodist University of Piracicaba and NUMA-USP

Av. Demétrio Mitre, 131, São Carlos, SP, Brazil

Fax: 55-16-2722731 - E-mail: sripires@sc.usp.br

Abstract

Supply Chain Management has quickly become a new forefront for companies interested in competitive advantages. More and more, companies are using Supply Chain Management to exploit the links between themselves and their suppliers and customers, providing many of the benefits of vertical integration without the associated losses in cost and flexibility. This article presents some basic concepts of Supply Chain Management and discusses some results from an empirical study conducted on five representative manufacturing companies operating in Brazil. The analysis highlights the current focus on the restructuring and consolidation of the supply chain.

Keywords

Supply chain management, material management, empirical studies

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1 INTRODUCTION

During the 1990's, competition in manufacturing has increased significantly in all of the industrialised regions of the globe. Many industries in the industrialised nations are now facing very competitive markets, problems such as over capacity, and new and increasing qualifying criteria for competition. In the newly industrialised nations many companies are now dealing with the reality of an open economy and the challenges from global competition. In both situations, old manufacturing paradigms and practices are no longer enough to meet the high level of competition. Even for the current leading or "lean organisations" it is not possible to assure a long term solid position in the market place. External and internal reasons for discontinuities and new customers expectations, continually threaten established market positions, and also create new territories for achieving competitive advantages, such as Supply Chain Management (SCM) which has been acclaimed as a new major forefront for effective competition. On the other hand, Brazilian manufacturing companies have recently faced a new competitive environment. This article focuses on the description and discussion of some innovations in SCM being implemented by five companies operating in Brazil.

2 AN OVERVIEW OF THE CURRENT BRAZILIAN MANUFACTURING ENVIRONMENT

The Brazilian industrial complex, which has been implemented mainly over of the last fifty years, embraces private Brazilian companies, multinational companies, state-owned companies and joint ventures. The country has developed considerable manufacturing capability producing a large range of products and services oriented towards internal and external markets.

After a long period of protection and stagnation, culminating in the 1980s, most Brazilian manufacturing enterprises are now facing a new and distinct competitive environment. The most significant change began early in the 1990s with the entrance of a liberal government and the beginning of the process of economic opening. This was followed by the implementation of Mercosul (SAFTA - South America Free Trade Agreement, as it is called in English), which has created a common market among Brazil, Argentina, Uruguay and Paraguay. The last event in the sequence was a major reduction in inflation which has increased the importance of manufacturing, replacing the relatively heavy weight of financial activities during the long period of high inflation.

The beginning of the process of economic opening occurred over a short period in which the domestic market was abruptly opened to foreign competitors. Most local producers lost their traditionally protected market. As a counterbalance to this, the Brazilian government created some initiatives and a program to stimulate growth in manufacturing competitiveness. The first responses occurred mostly in the leading firms, predominantly multinational companies. Consequently, many

industries were invaded by a wave of programs oriented towards industrial productivity and quality. A set of special programs in reengineering, downsizing, Just-in-time and ISO 9000 certifications quickly spread throughout the country.

The stabilisation and liberalisation plan put in place has been relatively successful, a fact that is reflected in the growth in industrial activity and especially in the return of foreign investments. In this context, SCM has quickly become a new forefront for companies interested in competitive advantages in the marketplace.

3 SUPPLY CHAIN MANAGEMENT AS A NEW COMPETITIVE MODEL

The basic objective of SCM is to maximise the synergy between all of the parts of the demand chain in order to serve the end consumer more effectively, either by reducing costs or by enhancing value. In order to reach this purpose, companies have search to align and join distinctive competencies in the entire demand chain. From this perspective, competition is currently being focused on productive chains, instead of on companies. In other words, this means a change of competitive model from the conventional "business unit" to a "virtual business unit" model. This "virtual enterprise" can provide many of the benefits of vertical integration without the losses in cost and flexibility.

New practices in SCM has been implemented in a competitive context characterised 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 (i.e. customised products, environmental questions, rapid development and delivery of new products, conciliation of higher quality with lower price, etc.). This environment of hyper competition 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.

SCM can also be understood as an extended, upgraded, and holistic vision of the traditional Material Management, embracing the entire productive chain in an integrated management approach. It presupposes that companies must redefine their competitive and functional strategies with regard to their position (as suppliers and/or customers) in the supply chain in which they are inserted. Effective practices in SCM have been implemented world wide 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).

- Sharing information and integrating infrastructure with customers and suppliers. This makes it possible to obtain just-in-time deliveries and decrease inventory levels. For example, the integration of information systems and the use of systems such as EDI (Electronic Data Interchange) among suppliers, customers, and logistical operators permits the practice of automatic product replacement on the customer shelf (cross-docking). The practice of maintaining in-plant representatives inside the customer's facilities permits a better balance between the customer's needs and the supplier's productive capacity.

- Providing joint solutions to problems and the involvement of the suppliers from the beginning of the development of new products.

- Designing products to improve the performance of the supply chain.

- Outsourcing the logistical system to a specialised logistical consolidator company.

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

4 AN EMPIRICAL STUDY IN FIVE BRAZILIAN COMPANIES

This section briefly describes and discusses some points concerning the SCM in five manufacturing companies operating in the state of São Paulo, Brazil. It is the result of a study of five representative companies from five distinct industries in Brazil. In spite of the limits of an exploratory study, the method used allowed for a more selective sample and "in-loco" interviews. Many other methods which might have been appropriate have been unsuccessfully applied in Brazil. For example, data surveys by mail receive a very low response from companies operating in the country. As this study not was looking for conclusive findings on SCM, more elaborate methods were not necessary.

The data was obtained by interviewing the person responsible for the SCM in the company (generally the logistical or materials director or manager), and using a prepared open questionnaire to conduct the interviews. In most cases, the data collected were supplemented by a visit to the manufacturing facilities.

The companies studied

All of the companies studied belong to distinct industries and lead the Brazilian market within their business segment. Table 1 presents some general data from the companies studied.

Table 1 General Data from the companies studied

	<i>Company A</i>	<i>Company B</i>	<i>Company C</i>	<i>Company D</i>	<i>Company E</i>
Origin	USA	Brazil	USA	USA	USA
Business segment	Machines for citrus juice industry	Tool and plastic injection machines	Automotive components (gear shifts)	Tractors	Hermetic (universal) compressors
Em- ployees	310	2,300	2,300	2,300	4,700
Main cus- tomers	Large Brazilian companies producing citrus juices for export	Small to large mechanical and plastic companies	Multi-national automotive companies	Govern-ment and mining companies	Refrigerator companies

What follow is a brief explanation of some important points regarding the SCM within the five companies.

Company A

Is a world-wide leader in the manufacture of machines and equipment for the citrus juice industry. The company has also started a new business in Brazil, beginning the production of machines for plastic packaging, but the citrus juice industry represents the largest part of its income.

With regards to the products for the citrus juice industry, the company has an interesting and successful system of partnership with the customers. Most products of this business segment are rented to the customers, in a close and very collaborative relationship in the supply chain. The company is responsible for the periodic upgrade and full-time maintenance (by in-plant representatives) of the products together with the customers. From the company's perspective, the system permits a better scheduling of production and income, a better utilisation of its productive resources, and a better knowledge of the customer's needs. Moreover, it creates a large market entrance barrier for potential competitors. From the customer's view, the system makes possible to run the factory with constantly upgraded machines at a relatively low level of investment.

Concerning its relationship with the suppliers, company A has recently made efforts to qualify suppliers in the region where its plant is located, and has implemented an "on-consignment" stock system with its key suppliers. This has allowed the company to decrease its inventory costs, and broaden its relationship with the key suppliers for others areas, such as the joint development of new product components.

Company B

Is a traditional and large Brazilian machine tools manufacturer. Recently, it has also begun producing plastic injection machines, in an attempt to diversify its production mix and become less dependent on the highly competitive domestic machine tools market.

The company has tried to differentiate its relationship with its customers by a careful policy of accompaniment before and after the sale. For this, the company maintains its own offices in several cities around the country, and has refused to outsource this process. Concerning its relationship with the suppliers, the company is still relatively vertically integrated, in spite of some outsource programs recently conducted. At the moment, is previously discussed with the suppliers for about 30% of the purchased components, increasing the speed of the purchasing process.

Company C

Is a world-wide manufacturer of automotive components. In Brazil, it produces gear shifts for most of the automotive companies operating in the country.

The company runs under a monthly master production schedule with its main customers, with daily deliveries oriented by an electronic kanban system and using a dedicated logistical system. Recently, following a strategy defined by the directors of the corporation, the company has increased its policy of global sourcing. Moreover, the company has restructured its local supplier base, and conducted a series of programs in order to increase the suppliers' delivery performance. The company also considers itself to have already reached a competitive level of cost and quality in its entire supply chain.

Company D

Is a world-wide manufacturer of tractors and similar machines for earth movement. The company has an aggressive policy of maintaining an after-sales relationship with the customers. For example, the company assures the world wide replacement of any damaged part or component within 24 hours. For this, the company maintains dealers in the entire country with a stock of the parts or components with the greatest demand according to the historical data base.

Following the corporate strategy, the company has used a group technology approach to manage its supply chain. Together with a restructuring of its local supply base, it has qualified suppliers to provide a "family of parts" instead of individual parts or components. Global sourcing is not a new policy for the company, and today about 30% of its product parts or components are imported (mostly electronics). For more than 8 years the company has been successfully using EDI with about 80% of its suppliers, with a previously-settled long term supply contract.

Company E

Is a manufacturer of hermetic (universal) compressors for the refrigerator industry. A compressor represents about 35% of refrigerator production cost, and about 70% of company's customers are located abroad, and the contact is managed by a monthly master production schedule. With the domestic customers, the deliveries are made by an electronic kanban system. Concerning the suppliers, the company has tried to create a selective local base (around 100 kilometres), establishing long term contracts with decreasing prices and monthly technical audits to check the product quality and delivery performance. The company is also introducing EDI with some key suppliers, and currently all of the procurement and purchasing activities are carried out by engineers, because the company considers these to be technical not persuasive activities. Global sourcing is not new for the company, although it recognises that today it is easier to implement this policy in Brazil than some years ago.

5 RESULTS

The data from the exploratory study confirm the current great interest of the companies in promoting transformations and improvements in the management of their entire supply chain; independent of its business segment, each company has made changes in order to gain competitive advantages from the SCM. Some policies and practices are highlighted below, according to the companies' relationship with its customers and suppliers.

From the company-customer relationship perspective:

- products rented to the customers, instead of sold;
- differentiated post-sales policy, such as the world wide replacement of a damaged part or component within 24 hours;
- long term supply contracts with decreasing prices, monthly master production scheduling, and deliveries by the (electronic) kanban system, have become standard when the customer is not the final consumer.

From the company-supplier relationship perspective:

- items available in the factory "on consignment";
- number of suppliers per item ranging from 1 to 3 (on average);
- statement of procurement and purchasing as an essentially technical activity;
- development of a local supplier base (as near as possible);
- direct communication with the supplier by EDI;
- use of the group technology concept in the SCM, by the use of an identical family of components for the company world wide, the classification of suppliers according families of components, and the purchase of families in specific regions;

- items with more aggregate technology provided by international suppliers, according to the experience of the corporation;
- contracts for long periods, deliveries by electronic kanban, and periodical evaluation of the suppliers performance;
- list of prices previously negotiated with the suppliers in order to speed up the purchasing process;
- classification of the suppliers according to the reliability of their quality and deliveries.

6 FINAL REMARKS

The empirical study confirms the ongoing movement of most manufacturing companies operating in Brazil towards an effective management of their supply chain. All five companies studied have made effective efforts in an attempt to **restructure** their productive chain (especially decreasing the number of suppliers), and **consolidate** their partnerships with both suppliers and customers (that is, deepening and narrowing the relationship), which is in agreement with the general trend in the area. Although analysing companies competing in distinct markets, the study highlights policies and practices in SCM in companies which are leaders within their business segment. Moreover, companies A and D presented the more updated practices related to the state-of-the-art in SCM, and were also the two companies with the best performance concerning “income per worker”.

7 REFERENCES

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8 BIOGRAPHY

Silvio R.I. Pires is a Professor of Manufacturing Management at the Methodist University of Piracicaba and a researcher of NUMA-USP (University of São Paulo) in Brazil. He worked for Villares-General Electric Equipment as a Manufacturing Planning and Control Manager, and has an undergraduate, Master's and Doctorate in Production Engineering. During 1996 was a member of IMD's research staff in Switzerland as an Research Associate Professor. Sandro A. Rodrigues has an undergraduate and Master's degree in Production Engineering.