ANALYSIS OF ASPECTS OF LOGISTICS USED BY GRUPO MIME: A STUDY OF DISTRIBUTION AND NETWORK OF FUEL STATIONS

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ABSTRACT
The subject of this paper is to analyze aspects of logistics used by the oil distributor and gas station chain controlled by Grupo Mime. We used qualitative techniques and document analysis. The study population was composed by the group managers. The article details aspects such as modal, amount of inventory, number of customers, strategic partnerships, etc. The chain of stations began in the city of Jaraguá do Sul, SC, Brazil in 1977. The Group started with only one gas station, and today it includes the headquarters and 22 branches. The Oil Distribution activities started in 2002 and now it supplies products to nearly 500 gas stations. The Group is controlled by the four partners. The results show that the organization has efficient logistics and creates competitive advantage. The study concludes that the Group has competitiveness strategies, seeking integration, speed, flexibility, service quality and cost management.

Keywords: Logistics. SCM. Distribution channels. Competitive advantage.

1. INTRODUCTION

The concept of logistics was introduced in military operations. Today, many organizations use logistics as a strategy to obtain competitive advantage. Logistics refers to the flow of incoming and outgoing goods, services, and information, as well as their storage, within and among organizations, emphasizing the physical distribution and storage of the goods produced by one organization (Novaes, 2004.). Logistics also deals with the distribution channels – manufacturer, wholesale, retail, and final consumer. Its evolution adds value, quality, and information to the supply chain. Logistics contributes to the improvement of service levels in organizations.

The main objective of this study is to analyze the logistics of Grupo Mime, which comprises a fuel distributor and a chain of gas stations. The specific objectives are: to verify the functioning of fuel logistics; to characterize the supply chains used by the organization; to explain the distribution of products by the convenience stores located in the gas stations, and to verify if the group's logistics provide a strategic edge and whether it generates a competitive advantage for the organization.
The choice of topic of analysis relates to the fact that the organization under study is the largest chain of fuel stations in the southern Brazilian state of Santa Catarina, and it includes its own distribution business. The company headquarters are located in the city of Jaraguá do Sul, with subsidiaries across the state as well as in the neighboring state of Paraná. The article is structured as follows: introduction, theoretical background, methodology, results, and final considerations.

2. THEORETICAL BACKGROUND

Following are the main concepts discussed in this article.

2.1 LOGISTICS

Logistics is a process of strategic management, acquisition, movement and storage of goods, and flows of information related with the organization and its marketing channels (Frankel et al., 2008). It integrates other areas of knowledge such as marketing, human resources, accounting, and others. It is subdivides into three major areas: supply logistics, internal logistics, and distribution logistics. These three divisions taken together constitute supply chain logistics.

According to Novaes (2004), logistics starts with the study of the process to be implemented, encompassing planning, implementation, operation, and control. The process should be undertaken in an economical, efficient, and effective manner, aiming to satisfy customer needs and preferences. The flows associated with logistics involve raw material storage, products under processing, finished products, information, and money, going through the suppliers, through manufacturing to the retailer, who will make the product available to the final consumer, the target of every supply chain. The flow can also be reversed, beginning at the consumer and flowing back to the suppliers of components and raw materials.

It should be noted that the main objective of logistics is to satisfy the clients, to meet their needs, to know their preferences and shopping habits, and to make sure the product is in
their hands when desired. Logistics is also associated with mapping demands, as well as with managing a distribution process that meets adequately the demands of a given target market.

In Brazil, under an increasing globalized and open economy, logistics has become more important to organizations. Many companies are still unable to have good logistics because they lack an appropriate organizational structure. Today, logistics must be well-planned, improve quality, and reduce complexity; thus many organizations see the need to establish partnerships to improve the process, generating benefits such as lower total cost and competitive advantage. Logistics is associated with Supply Chain Management (SCM), as we will discuss next.

SCM integrates multiple organizational functions and includes purchase, management operations and marketing channel management, logistics, and industrial as well as commercial processes. The supply chain is generally conceived as a network of supplier companies for the final users, who have the intention of integrating supply and demand through coordinated efforts (Lambert, Garcia-Dastugue & Croxton, 2005). SCM has the goal of increasing synergies between each part of the production chain, in order to serve the final consumer in the most efficient manner through cost reduction, as well as increased value added to the final products. According to Porter (1990, p. 31), “a company gains competitive advantage executing these strategically important activities in a cheaper or better way than the competition”. This strengthens the idea of reducing management costs in order to obtain a competitive edge.

Supply chain management is, sometimes, known as a value chain or demand chain, the intent of which is to improve operational efficiency as well as the strategic positioning of organizations. The supply chain offers many opportunities, but is still considered a challenge by many companies. It is a means to increase profitability and growth. Supply chain structure and strategy result in efforts aiming to connect the organization with the client operationally with the intent of obtaining a competitive advantage (Bowersox, 2006).
Supply Chain Management also includes some important issues such as: environmental uncertainty, customer focus, management support, supply, information technology strategy, supply network structure, management of buyer-supplier relationships, logistic integration, sourcing and performance measurement along the chain (Larson, Poist & Halldorson, 2007). A noteworthy element in Supply Chain Management concerns the marketing or distribution channels that support the whole process, which we will examine next.

2.2 DISTRIBUTION CHANNELS

Distribution or marketing channel management requires planning, organization, coordination, direction and control. Marketing channels can be seen as flow and transport systems and therefore demand physical, logical and transactional structures. (Frankel et al., 2008). Telles (2006) highlights that the marketing channels constitute the base of the distribution process, stimulating and leveraging the flow of products between manufacturers and consumers or final users.

The distribution channels, as well as logistics and SCM, generate a competitive advantage for organizations. Some companies have already been utilizing marketing channels as a strategic tool and as a form of satisfying customer needs successfully in a competitive way. Marketing channels are responsible for placing the products at the time and place where they are needed (Rosenbloom, 2002). Marketing channels represent a value network, where organizations join to bring products from their origin to the place of consumption. The producer of goods and services gains access to the market through marketing channels. The distribution channels are a fundamental element in commercial strategy. According to Coughlan et al. (2002), a marketing/distribution channel is a group of interdependent organizations involved in the process of making available a product or service for consumption or use. Each member of the channel depends on the rest, be it wholesale or retail.

Five factors are responsible for the growing emphasis on marketing channel strategy: the increasing difficulty to obtain a competitive edge; the growing power of distributors, especially the large retailers; the need to reduce distribution costs; the reevaluation of growth; and the ever-growing function of technology.

The structure of marketing or distribution channels comprises the manufacturer or producer, the intermediaries – wholesale and retail – and the final user or consumer. The channel structure can have two levels (manufacturer, consumer); three levels (manufacturer, retailer, consumer); four levels (manufacturer, wholesaler, retailer, consumer); or five levels (manufacturer, agent, wholesaler, retailer, consumer) (Rosenbloom, 2002).

The manufacturer is responsible for the fabrication, producing goods or services. As for the wholesalers, they can be traditional; agents, brokers and commissioned representatives; subsidiaries and manufacturers' sales offices. Wholesalers are well-placed to execute distribution duties for the manufacturers such as: providing market coverage, making contacts, keeping inventories, among others. Retail, on the other hand, are companies that sell products and services directly to the final consumer. The retailer’s main purpose is to interpret their customers' demands and find the products they want (Rosenbloom, 2002). The marketing channels that go through intermediaries (wholesale and retail) facilitate easier on both sides of the channel. And the consumer is the one who buys or consumes the product or service that aggregates value and fulfills his needs.

Currently, logistics, Supply Chain Management and distribution channels are important elements for organizations, because if managed strategically they guarantee a competitive advantage for the organization, and it needs to have an edge over the competition to succeed. What follows is an explanation of what competitive advantage is and why it is important for organizations.

2.3 COMPETITIVE ADVANTAGE
There are several explanatory and theoretical approaches toward competitive advantage. Competitive advantage can be explained by both internal and external factors. The external factors are linked to industrial markets and structures while the internal factors are specific to the company. Competitive advantage can also be understood as any advantage that an organization has in relation to its competitors (Bertero, 2006).

Every organization searches for efficiency in its processes and cost reduction in every activity it performs, and one of them is logistics. Many companies manage to obtain competitive advantage by reducing their costs of logistics, by improving supply chain management and by opting for distribution channels that are more efficient and at the same time faster and more accessible in terms of financial costs to the firm. By doing so, they seek to differentiate themselves from their competitors, keeping their customers and gaining new ones. Another important factor is time. An improvement in logistic management is linked to better financial performance.

Porter (1980) adds that the positioning of organizations within the industrial structure is the main factor in determining success or failure in a competitive scenario. Regarding competitive strategy, Porter explains that it is important for the organization to find a position in its sector, to know how to defend itself against competitive forces or even use them in its favor. As they analyze the industry, managers are able to comprehend their current position and create strategies to improve it and obtain competitive advantage. Many organizations today choose to achieve competitive advantage through improvements in logistics and supply chain management.

The following section describes the method used to analyze the case under study.

3. METHOD

Qualitative methodological techniques were used to analyze the phenomenon under investigation. The choice of method is justified by the interaction between the researcher and the interviewees. The interpretation of the phenomena and the attribution of meaning are the
basic concepts in the process of qualitative research, which doesn't require the use of statistical methods and techniques. The natural environment is the direct source for data collection and the researcher is the key instrument.

The study population was composed of four managers. Firstly, data collection was conducted through means of an exploratory interview with eighteen questions, followed by three in-depth interviews with eleven questions. The exploratory interview was held with the administrative manager of Grupo Mime, which is composed of four companies: Rede de Postos Mime, Agricopel, Mime Distribuidora de Petróleo Ltda. and Mime Hotel. After the initial interview, the research was focused on the organization's logistics, encompassing Mime Distribuidora de Petróleo Ltda (oil distributor) and Rede de Postos Mime (chain of fuel stations).

The second stage of field research comprised visits to Mime Distribuidora and Agricopel, located in Jaraguá do Sul. There, three in-depth interviews were held with: the operational manager of transport for VNG (Vehicular Natural Gas); the liquid fuels logistics manager; and the maintenance manager for Mime Distribuidora and Agricopel. The interviewees allowed access to informative materials about Grupo Mime, where it was possible to analyze documents to find out more about the history and several aspects of the Group. It was also possible to learn about all the logistics procedures, about loading trucks with liquid fuels, and to visit the Distribution Center that stores products commercialized in the fuel station chain's convenience stores and Agricopel products (lubricants, filters, among others).

4. RESULTS

Grupo Mime began its history with the establishment of Mime fuel stations in Jaraguá do Sul, Santa Catarina state, in 1977. The city is the third largest industry in the state. In the beginning, there was only one gas station and now the Group encompasses the headquarters as well as 23 subsidiaries that make up its fuel station chain, which are located in major cities
across Santa Catarina (17 subsidiaries) and Paraná (5 subsidiaries). The Group is owned by four brothers – one is responsible for logistics, one is the administrative manager, another manages maintenance and construction work while the fourth partner manages the Human Resources sector of the Group's convenience stores.

The chain of fuel stations stands out for its excellency in customer service and its convenience stores, established in 1992. It was the first chain in the state to provide VNG (Vehicular Natural Gas), in 2001.

In 1990, the Group invested in Agricopel, a company specialized in the distribution of petroleum-based products and automotive accessories, distributing many national and international brands. The activities of Mime Distribuidora de Petróleo Ltda started in 2002, supplying products to more than 90 Mime-branded (franchised) stations and to approximately 400 independent stations in Santa Catarina and Paraná. Independent (or “no-brand”) fuel stations do not have a contract with an exclusive supplier and search out the best price in the market. In 2008, the Group inaugurated its fourth venture, the Mime Hotel, in the city of Blumenau. During the interview, Grupo Mime's manager made clear that the company focus is fuel and petroleum-based products. “We're also in retail, we have convenience stores that are part of the business, but our defining characteristic is the supply of liquid fuels, VNG and CNG”.

Distribuidora de Petróleo Mime Ltda is located in Jaraguá do Sul. It occupies an area of fifty thousand square meters, that also houses Agricopel and the Distribution Center for convenience store products. The supplier generates a competitive advantage for the Group with the creation of strategic distribution routes that ensure their clients are served very quickly. The distributor has its own fleet, so it does not depend on third-party transportation companies.

The fact that the company owns its own stations, distribution facilities and transportation fleet leads to the creation of competitive advantages, according to the
managers. In order to have that edge, aspects such as planning, implementation, operation and logistics control are highly valued. These aspects corroborate Novaes’ (2004) recommendation of their use for business management, knowing its importance for meeting deadlines, improving supplier partnerships, streamlining processes, and generating cost reductions throughout the entire supply chain.

The distributor commercializes liquid fuels (gasoline, ethanol and diesel) as well as VNG (Vehicular Natural Gas, since 2001) and CNG (Compressed Natural Gas, since 2007). In order to handle distribution, the company owns 90 trucks that supply liquid fuel (gasoline, alcohol, diesel), carrying anywhere from 10 thousand to 45 thousand liters each. The trucks that carry from 10 to 35 thousand liters connect the distributor to the gas stations. The bigger, double-tank trains collect the fuel at the refineries, taking the product to be stocked at the distributor. Altogether, the Group owns 120 trucks, the rest being used for CNG and convenience store product transportation.

The gasoline and diesel sold by the distributor come from refineries or oil terminals located in the cities of Araucária (Paraná), Itajaí and Guaramirim (Santa Catarina). The fuel brought from Guaramirim, at the Petrobras Transporte SA – Transpetro terminal is commercialized via pipeline, since Transpetro deals with the transportation and storage activities of oil-based products, ethanol, bio-fuels and natural gas. On the other hand, ethanol is supplied by plants located in São Paulo and Canoas (Rio Grande do Sul) to the bases located in the cities of Içara and Irani, in Santa Catarina. The distribution headquarters located in Jaraguá do Sul also owns three subsidiaries. They are located in Içara, which serves the southern Santa Catarina market; in Irani, which serves the western portion of the state; and a third, established in December 2010, in Curitiba (Paraná), which serves the state of Paraná.

The storage capacity at the distributor headquarters is two million liters, divided among gasoline, alcohol, diesel, marine kerosene, among others. Inventory turnover happens daily. Every day the trucks get fuel at the refineries and plants for storage in the distribution
center. From there, other trucks take the fuel to the gas stations, where the final consumer buys the product. Every month, around 33 million liters of liquid fuel are sold by the distributor, to both the chain's gas stations and the independent ones. Among the liquid fuels that sell the most is diesel, at about 18 million liters per month. The storage capacity at the subsidiaries in Irani and Içara are approximately 350 thousand liters each. It should be highlighted that the 45 thousand-liter trucks that bring products from the refineries and plants only carry one type of fuel at a time, while the 10 to 35 thousand-liter trucks are subdivided into eight parts to carry every type of fuel available at their station. The trucks are also equipped with tracking devices, allowing the company to tell the client the precise time of the product's arrival.

Every day, two trucks go to Araucária (PR) to pick up fuel, while three trucks pick up fuel at Guaramirim and Itajaí. The main suppliers are Petrobras, Shell, and Ipiranga. It should be noted that the only producer of oil-based products in Brazil is Petrobras and that the sale to independent distributors is done by a quota system. The distributor also buys in the open market when its refinery quota is lower than the predicted demand. To deal with that, it ends up having to buy from competing distributors that have a surplus of product. Mixing and product quality verification processes are also done at the distributor.

*Distribuidora Mime* also issues loyalty contracts. In this case, the distributor invests a certain amount into the partner's business and negotiates a supply deal that can last for five, eight, or ten years, depending on the amount to be invested. Furthermore, it offers support to the partners that use its brand and provides layout, projects, joint promotions and product placement. Over time, the chain stations and the subsidiaries are becoming franchises. This leads to increased homogeneity in the chain, with all stations providing the same standards in all services. As a consequence, the client perceives the aggregated value to be greater.

Regarding ethanol, the distributor works with four to five suppliers and picks up the product in plants. In this case there is no supply contract such as with Petrobras. According to
the administrative manager at Grupo Mime, “with Petrobras the petroleum quota has a 10% margin, plus or minus. If the distributor goes above or below its quota, they must pay a fine, which means if they want to buy more or less petroleum they have to pay more than they normally would. At the refineries we have a supply contract, and at their counterparts what prevails is negotiation, which can be done every day, week, or month.” At the plants, however, there are no contracts but daily negotiations. The distributor gets ethanol not only in Canoas (RS) but also near Jacarezinho, Maringá, Londrina (PR) and in Ourinhos (SP), and even in the state of Mato Grosso.

Regarding the distribution of fuels to customers (the retail gas stations), according to the liquid fuel logistics manager, “our logistics is a bit different than that of other transportation companies. Here we account for all the product the client wishes to purchase up to the end of each day and send the necessary products according to the type of trucks we have, so for nearby cities we only have to send one truck for distribution.” It's noticeable that the Group saves on time and money, which is fundamental to good logistic management. These aspects also help to expand competitive advantage. According to Barney (2002), the evidence that a company has a sustainable competitive advantage is the presence of consistent above-average performance. Competitive advantage can come both from resources and skills that are unique to the specific company and from exploration of a specific, protected position in the market structure (Cool, Costa & Dierickx, 2002).

The deliveries for Mime chain stations, franchised and independent stations can be very fractionated. A single client may order 5 thousand liters of gasoline, 3 thousand liters of ethanol and 3 thousand liters of diesel fuel in a single request. To do this kind of delivery, a truck with separate compartments is used. According to the logistics manager “we seek to compose a load of between 10 thousand and 30 thousand liters, to make the most of each truck.” The sector of logistics for Mime Distributor and chain stations receives daily information about the current fuel inventory both in the distributor and affiliated gas stations.
Based on that information, the next day's station refueling is scheduled. Product requests are billed daily by 5:30 PM for next-day deliveries. The trucks start loading up and transporting fuel around 4 AM every day. In all, four people are in charge of the Distributor's logistics, for both liquid fuels and natural gas. It is noteworthy in this study that the Distributor is committed to each client, ensuring that deliveries are made on time. This helps to improve credibility and customer loyalty.

VNG (Vehicular Natural Gas) is commercialized especially to taxi fleets, vans and pick-up trucks. It is an alternative fuel that provides savings of up to 60 percent the final consumer. The product is distributed via gas pipelines by the state-owned company SC Gás and goes directly to some of the chain's gas stations. Another noteworthy characteristic of Grupo Mime is the commercialization of CNG (Compressed Natural Gas). CNG is compressed VNG. The compression is done at one of the chain's stations and the product is distributed by special-purpose trucks to more than eleven cities that are not served by the gas pipelines. The trucks go to franchised and independent stations, where they leave a full load of gas and pick up the empty one. The full container provides gas storage and transportation at the same time, as if it were a pipeline. The truck's cargo stays at the station and goes directly to the dispenser that provides gas to refueling vehicles from final consumers. The system that transfers gas directly to the vehicle is American-made and maintains the quality and pressure required for the gas to be used in the vehicle. This example makes clear that technology and carefully planned logistics enable gas distribution in places not reached by the pipelines, making the flow of product between producers and consumers smoother and easier, as described by Telles (2006). Logistics is also associated with innovation and technology (Novaes, 2004).

The containers have a system that measures the remaining gas, so the station knows when the CNG is running out and can estimate when to make a new purchase. Distribuidora Mime holds a strategic partnership with the system provider company Delgás. Through
Delgás’ website, it's possible to find out the gas inventory in each station, through a tracking device. Hence the gas station owner and the Distributor can manage the amount of gas in each container. This helps to predict the inventory so the stations are not left without product. Gas marketing requires 24/7 work, and the distributor has three drivers on standby around the clock to deliver to the stations that run out of gas first.

One of the goals of Mime Distribuidora is to create a CNG route, increasing the number of stations that can provide natural gas in cities with no gas pipeline, while also offering quality and technology, from customer service to product delivery. For that purpose, the Distributor guarantees the compliance of its fuels, which are monitored through a rigorous control system, and offers complete, customized solutions, both in the installation and maintenance of each station’s equipment.

Grupo Mime actively prevents environmental hazards, adopting procedures to avoid spills and storing fuels in specialized containers. At the Distributor, there are retention basins and oil separation tanks. Grupo Mime also invests in training and equipment to ensure the safety of their employees, facilities, the environment, and their commercial partners.

The Mime chain of fuel stations is renowned for its good customer service, offering high quality services in the areas of refueling, oil changes, and car washing, as well as the products sold in the convenience stores. The stores stand out because of their innovative concept and a vast assortment of products. There are around 300 suppliers of products, ranging from chewing gum to soft drinks. Purchasing is centralized, dealing directly with the suppliers. The Distribution Center receives the products and redistributes them to the convenience stores. Some suppliers, such as Elma Chips, deliver the product directly to the stores, so those items are not stored in the Distribution Center. Vehicular accessories and lubricants are also stored at the Distribution Center, adjacent to Mime Distribuidora de Petróleo Ltda.
Inventory management for fuels as well as for convenience store products is based on forecasts. Fuel inventory forecasts are based on sales history, while the convenience stores resupply weekly. The inventory forecast analysis is done with an automated system, but the management has the final say after examining the report and considering recent events. Demand forecast encompasses such variables as harvest periods, seasons, holidays, market trends, and promotions.

Grupo Mime's chain of fuel stations has more than 200 thousand customers, of which 30 percent carry the Group's loyalty card. The Group not only serves individuals but also corporate accounts, serving prominently companies, hospitals, and public agencies.

According to the administrative manager of the Group, “our logistics is very important, as our business is small-scale, low-margin. So our logistics does have to be very competitive. Logistics tends to be costly, so the crucial thing here is to differentiate ourselves with economical, low-cost logistics”. The manager also emphasizes that Grupo Mime's focus is on fuel, the organization's flagship operation, but that it is important to highlight that the chain's convenience stores also stand out, and require retail skills, since operating them involves dealing with perishable goods. He claims that it is a dynamic, difficult work, but at the same time the stores contribute greatly to their success in selling fuel.

According to the manager, “the store is very important for the business, it generates traffic and contributes to the profits. The stores tend to sell more than average. The stores are responsible for much of the gas stations' success, since a station with no store cannot survive very long in the market, and a badly managed store won't have satisfactory results and will harm the fuel sales. A well managed shop, on the other hand, is able to get good results for the store itself as well as for the station's fuel sales. Gas stations with convenience stores historically have had better results, that is, the store helps to sell the fuel”.

5. FINAL CONSIDERATIONS
The study of the logistics of Mime's oil distributor and chain of fuel stations helps to understand the importance of logistics, Supply Chain Management and Distribution Channels for organizations, since competitive advantage can be created by strategy and good management which is always alert to changes in the external environment.

**Grupo Mime's** logistics generates competitive advantage. Planning can be seen in the Group's logistics initiatives, as well as concern with innovation, product and service quality and customer service. These characteristics are visible at Mime gas stations, franchisees, and independent stations. Nowadays, the organization that has the best chain is going to be more able to compete, since competition doesn't happen between companies anymore but between supply chains.

The study showed that **Grupo Mime** has strategies to achieve competitive advantage, integration, speed, flexibility, service quality and cost management that ensure logistic excellence, since according to Novaes (2004), logistics is a strategic management process.

**Grupo Mime** is able to manage the physical distribution of their products (fuels/convenience stores), receiving, storing, and shipping. Another of the Group's logistic advantages is its own fleet and use of technologies that ensure good inventory management of their products. The Group holds strategic alliances that uphold its competitive advantage, with refineries, plants, or VNG supplying companies. **Distribuidora Mime** and **Rede de Postos Mime** relate directly to various partners such as suppliers of fuel and convenience store products, gas stations and the final consumer.

It becomes evident from the findings of this study that logistics contributes to the development of this organization, and that it does more than just deal with storage and distribution of products. Logistics is also associated with the mapping of demand, as well as with managing a distribution process that attends adequately to the demands of a given target market.
As suggestions of further research work arising from this article, one could develop studies of other fuel distributors and gas station chains, as well as studies on the importance of convenience stores for gas stations.

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