Abstract

Internal movement of materials outsourcing reversal: a case study in a tire manufacturing company

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Abstract

Internal movement of materials outsourcing reversal: a case study in a tire manufacturing company. This article describes the potential advantages and disadvantages of outsourcing the internal movement of materials, identifies the reasons of a manufacturer of tires to reverse its internal services movement with the use of industrial vehicles, and presents the results from the reversal of this process.

Key words: Outsourcing reversal, insourcing, outsourcing, internal movement, industrial vehicles.

INTRODUCTION

"The value chain is a tool that serves to identify opportunities in any analysis that has the intent to increase the value by intensifying links. When all the processes are strong, the entire channel value tightens against competitors" (SANTOS, 1996). Logistics management is an important part in this process, because it has become one of the most important strategic activities within a supply chain, it is present in the entire value chain, from the moment of acquisition of raw materials to product delivery end consumer (GONZALES, 2002).
Within this approach, the internal movement of materials in manufacturing, which is embedded in the logistics within the value chain, can be included in this competitive strategic environment when managed through a lean logistic process. The systems of internal lean logistics approaches are dynamic organizations, thus becoming a useful way of thinking about growth and organizational changes, provided through waste reduction and investment activities in unnecessary procedures focus (ZAGO ET AL., 2008).

The concept of the company to focus on core business remained very strong in Brazil from the 90s, where outsourcing has created strength in many industrial processes and services area, being used as a competitive advantage to supply chain. However, it was realized that outsourcing in some cases, although not part of the core business of the company, was not as efficient in the long run, causing some companies to adopt the rollback process called reverse insourcing or outsourcing (DOMINGUES ET AL., 2008).

This is the case presented in this article, which an industry manufacturer of tires for the automotive industry, agribusiness and aerospace reversed the outsourcing process of internal materials movement service taken by forklifts and other industrial vehicles powered by natural gas or electric batteries as a way to reduce waste in their processes.

The primary objective of this paper is to identify the reasons that led the industry in question to insource the process of internal materials movement. For this it was necessary to know how the outsourcing service was widespread in Brazil and how this outsourcing industry joined in the 90s. For this it was necessary to raise the advantages and disadvantages of outsourcing services through the literature review. It was also important to know the system of internal movement used by the company and see how lean thinking has helped to make this process was successful.

METHODOLOGY

This paper presents a single case study about the insourcing the internal movement of materials through service vehicles in a manufacturer of tires in the city of São Paulo. According to Yin (2005), among other things, the case studies represent the preferred strategy when the focus is on contemporary phenomena inserted at some real-life context. Case study should be the preferred research strategy when “how” and “why” questions are involved, when the researchers have low control over the researched events and when contemporaneous events in a real-life context are involved (YIN, 2010). In the 90s, with the opening of the world market, there was a great outsourcing movement in Brazil and this represented a structural change in the employment relationship. Also a brief literature review on internal movement of materials and on outsourcing in Brazil will be presented, showing the advantages and disadvantages of outsourcing.

THEORETICAL REFERENCES

The theoretical references used in this work was taken through specialized search sites in academic journals such as SciELO, Google Scholar and the Coordination of Improvement of
Higher Education Personnel Portal (http://www.capes.gov.br/), using the terms: internal logistics, internal movement, lean logistics, outsourcing and insourcing and the same sentences in Portuguese. It was not used papers whose the subjects were relating exclusively to information technology, because there weren't features which are applicable to the manufacturing environment as is the focus of the work.

a. The internal movement of materials within the supply chain

Porter (1989, p. 36) define that "internal logistics are linked to receipt, storage and distribution of supplies in the product, such as material handling, warehousing, inventory control, fleet scheduling, vehicles and suppliers return to activities".

According to Coimbra (2004) internal logistics is responsible for the company's value chain because seeking to optimize the processes inherent to the activities such as the infrastructure of the layout of internal distribution and information systems, development acquirement’s technology and primary support activities such as maintaining minimum inventory, delivery of products at points of use and other activities linked to production to the final product is shipped at the right time and with the right quality, using the least possible resources, which will add more value to the product.

Ran (2009) says the internal logistics is one of the most important parts within the company, since it manages, organizes, plans and delivers the finished product. He demonstrates, in Figure 1, where the internal logistics is inserted in the supply chain:

![Figure 1 - The internal logistics in the supply chain](image)

The internal movement of materials is an integral part of the internal logistics which in turn is part of value chain therefore is included in the supply chain. This assumes that is impossible manage efficiently the supply chain if haven't an effective materials transport through the value chain.

b. Outsourcing in Brazil
In Brazil, the term "terceirização" ("outsourcing") is the result of neologism derived from the word "terceiro" ("third"), this as a synonym for "intervening" or "intermediate". It is a neologism constructed by management science, to emphasize the decentralization of business activities to another, to a third company (FONSECA ET AL., 2012).

The practice of outsourcing in Brazil has been practiced since the 1990s, being an activity where the company focuses on its core business and what we can do best, leaving the secondary and auxiliary tasks to specialized companies, thereby generating higher quality, competitiveness and quality (VALENCIA AND BARBOSA, 2002). Some authors differ in opinion about its advantages and disadvantages. Dutra, Castilhos and Borba (1993) defined as the act of outsourcing services to third parties and assign tasks that can be performed perfectly out of sight and even the effective control of the chief of these services.

In the 1990s outsourcing was one of the main features adopted by companies to reduce costs with the labor force, which results in the exploitation of labor and the precarious living conditions of workers. Outsourcing allows companies possess a power to hire and easy work free of charge at the time of layoff (OLIVEIRA, 2009).

Also in this period, in Brazil many studies did mention the differences between subcontracting and outsourcing. Pinheiro (1999) referenced five authors who have treated this subject and defined as shown in Table 1:

<table>
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<tr>
<th>Authors</th>
<th>Year</th>
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<tbody>
<tr>
<td>Brasil</td>
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<td>Dutra, Castilhos e Borba</td>
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<td>Henkin</td>
<td>1995</td>
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<td>Abreu e Sorj</td>
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<td>Kruglianskas</td>
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The above authors define outsourcing as the act of externalize support activities, especially administrative: cleaning, property security, restaurant, recruitment and selection, market research, accounting, information technology, among others. Have subcontracting refers to activities directly related to the purpose of the company. Nevertheless, there is still a discussion about how to differentiate support activities and core activities. An example is how to define maintenance and development activities (HENKIN, 1995).

Pinheiro (1999) arguments that admitting the subcontracting and outsourcing as a trend to be followed by (almost) all companies, regardless of size and/or industry is precipitated as there are circumstances which outsourcing can increase the costs of company, compromising quality,
bringing uncertainty to the development and delivery deadlines, and expose their technology, among other characteristics related to its competitiveness.

According to Sa, Bomtempo and Quental (1997) there are three reasons why companies outsource: the dilution of direct and indirect costs, raising the level of efficiency of this activity and maintenance of an acceptable minimum level of loyalty the company for new performers of outsourced activities.

To Kumari (2013), empirical evidence suggests that outsourcing strategies carefully crafted increase the overall performance of the company. Outsourcing is generally considered to be a very powerful tool to reduce costs and improve performance, because through it, companies can make better use of outside vendors and restructure departments more resistant to change. Outsourcing can also help companies focus on their core business. At the same time insourcing is having an impact on long-term organizational growth. The U.S. President also noted that the insourcing is the path to sustainable growth in the country.

c. Insourcing: the reverse process

There aren’t many academic studies addressing insourcing but are reports of companies that are making the decision to reverse the outsourcing of some services that were outsourced in the 90s, such as HR, IT and maintenance. One of the big deciding factors was critical that companies contracted companies without a specific know-how about the activity, rather than having cost reduction as originally hoped, had neutral or even negative results (FONSECA et. al., 2012).

The process insourcing supports the flexibility of manpower, since the company ceases to use the Taylorist/Fordist model, where tasks are clear and tightly defined by hand, while the organizations of modern jobs require a workforce versatile and proactive (OLIVEIRA, 2009).

With the increased concern for customer satisfaction, some companies have begun a process of reversal of outsourcing. This process gave the name of outsource reverse, as in Brazil, was called insourcing (CASTRO, BIM AND MOSCARDINI, 2004).

Due to the rigor of the Brazilian labor legislation against illegal outsourcing, prosecutors intensified surveillance that was one of the factors to practice insourcing, but not the only one. Other factors such as economic efficiency and quality services are important justifications in replacement of outsourced labor for permanent workers of the company process (OLIVEIRA, 2012).

A good reference to use of the grounds for insource is a consequence of the disadvantages in outsourcing. Leiria (1995) mentions: increased risk to be managed, layoffs at the initial stage, lack of price parameter in the initial hiring, cost of layoffs, bad choice of partners, poor management of the process and increased reliance on third parties.

CASE STUDY
Following the global tendency of the 90s to focus on their core business, one tire manufacturer located in the city of São Paulo decided to outsource some of their processes, including the process of internal transport of materials. The transportation is performed by forklifts and industrial tugs powered internal combustion engines or battery. These vehicles are used by the entire value chain, from receipt of raw materials, through the movement of work in process and also in finished products warehouse. In Figure 2 you can see the processes in the value chain of tire production, and to observe the amount of vehicles in each case:

![Figure 2 - Number of operators outsourced production process for industrial vehicles](image)

As we can see in the above process, the process of internal movement of materials of industry in question had fourteen forklift operators in the receiving raw materials area to unload materials from trucks and supply the banbury (mixture materials for rubber production) with the raw materials at the time it was requested. Nine operators forklift to remove pallets compounds produced by banburys three trucks to supply calenders with treatments (extruded nylon or steel with composite) and composed of six people dedicated to supplying and removing parts of the extruders seven people operating tugs green tire and nine forklift operators to ship finished products in the shipment. These 48 employees work in three shifts of eight hour each one being: 19 in the daytime, 17 in the afternoon and 12 in the night shift.

According to Shingo (1981) shipping is one of the seven wastes that lean manufacturing seeks to eliminate and waste are all elements that do not add value to the product from the point of view of the customer. By analyzing the value stream mapping done previously, the company realized that it could reduce its movement through some layout changes and low investment using the technique of job combination to reduce the manpower used to perform transport this material.

As it is not allowed to exercise tasks outsourced employees that have a direct connection with the processing of the products, the use of combined work would be restricted. It was in this context that came into discussion the possibility of insource the service that was called internal logistics. For this analysis the average salary paid to a forklift operator on the market and the contract value was taken. Isn’t the most important to show openly the contract values, but the contract costs were analyzed versus the wage cost ceiling applied to the market in June 2011, considering all benefits such as family medical plan, dental plan, Profit and Results participation,
transportation, restaurant cost, onsite physiotherapy and sports club cost. It was considered 115% of charges for each worker over the salary ceiling to make the financial analysis of the viability of insourcing. This difference would have a reduction in annual costs around US$ 150,000.00, without using the job combination as part of results. This value excludes shipping logistics, as was done by another company and had another contract covering the services in finish goods area, which reduced the initial number to 39 contractors forklift operators.

Besides performing the regular employee status instead of hired employee, there was the challenge of making leaner activities and reduce the need for transport. Womack (2005) says that the lean thinker, instead of seeking lower wages, asks why these tasks need to be done. In this context, there were some layout changes that have reduced shipping and handling. These changes reduced the need for 39 to 31 dedicated forklift operators (Figure 3), increasing the saving to US$ 445,000.00.

![Figure 3 - Number of operators dedicated vehicles after insourcing](image)

**RESULTS**

In this case study it was revealed that the main objective of the company was cutting costs and this goal was achieved with the insourcing because it could make some combinations that work would not be possible using outsourced services.

In most of cases, the outsourced operators were hired from subcontractors and thus beyond financial gains, other benefits were detected such as:

- People development in other skills, can enjoy their in other activities;
- Best performance audits because from insourcing, the forklift operators could enjoy the same training internally practiced;
- Significant improvement in the productivity and cost factory;
- Employee turnover reduction;
- Increase of flexibility of manpower, reducing the impacts in cases of absenteeism;
- Increased commitment to the supply of the machines, reducing waste by waiting;
- The employees were included in all safety programs and continuous improvement with greater effectiveness;
The commitment of employees increased by not feeling different from other plant operators.

CONCLUSIONS

The theme of outsourcing is not new, but it is a topic that is far from exhausted both in business and academia. The mistakes made in outsourcing services in the 90s should be a lesson not only for this type of process as to any decision involving subcontracting or outsourcing services. Therefore, may occur the reverse process that has been studied in this paper.

The purpose of this single case study was to identify the reasons that led a tires industry to insource their internal logistics services using vehicles without the intention of testing any hypothesis. Also had the specific objective, review the outsourcing process in Brazil and the main reasons why many companies decided to reverse them.

In the study was observed that outsourcing should not be undertaken only as a method of reducing the cost of direct labor, but as a means to perform a service or procedure by a company that has a greater expertise in a certain activity.

In addition to financial benefits, could other indicators such as quality, people satisfaction, reduce wasted time in machines for failure to supply, turnover, absenteeism and WIP reduction have been analyzed. However, at this time there were other improvements that prevent it from being analyzed separately insourcing factor.

One of the contributions of this study is able to assist future work both in terms of the insourcing services in industrial area and specifically on internal materials transportation. In our case, the process of insourcing brought benefits to lean manufacturing, it reduces the handling, transportation, waits, increasing the uptime of machinery and therefore increasing productivity in the company.

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