

Supplier Relationship Management: relationship between adopted practices and performance in the auto parts supply chain

065-1500.pdf

Wilson de Castro Hilsdorf

Centro Universitário da FEI

wicastro@fei.edu.br

Carlos Alberto Colonna Romano

Centro Universitário da FEI

Abstract

The Supplier Relationship Management is a current subject of interest for many companies to achieve key organizational objectives. The goal of this paper is to identify if the use of SRM practices influence the performance of industrial auto parts companies in Brazil, providing information for definition of supplier strategy.

Key words: Supplier relationship management, Supply chain, Supply chain management

INTRODUCTION

Supply Chain Management (SCM), defined as the integration of a company's key processes, suppliers, and customers (CROXTON et al., 2001), is one of the key subjects of interest of top executives from major goods and services suppliers. In order to achieve their goals, companies are nowadays more aware of the key business competencies, which lead them to buy an increasing quantity of products and services from suppliers, thus increasing their dependence on them. This growing dependence of companies in relation to their suppliers becomes a problem when they do not reach the intended performance, as it may compromise the company's main objectives, such as its financial economic result and customer satisfaction. For suppliers to meet their desired performance, several companies need to establish a strategy to implement the management process of the relationship with their suppliers, many times without knowing which strategy is the most appropriate.

Supplier Relationship Management (SRM) is one of the processes of Supply Chain management, and it defines how supplier relationship is developed and maintained (LAMBERT

et al., 1998). Several studies have already been carried out regarding Supplier Relationship Management, such as the studies by Lambert (2004), demonstrating its impact and positive effect in the operational results of the performance of companies. However, most of these studies do not evaluate the practices to be adopted and the results that can be obtained with their adoption. Analyzing the effects of implementing SRM in the performance obtained does not help companies to identify the contribution of specific practices, and therefore does not help them to define which practices should be implemented.

This study aims at identifying how Supplier Relationship Management practices are related to the performance of automotive parts manufacturers, thus providing information to define the strategy of Supplier Relationship Management. The researchers decided to carry out this research jointly with automotive parts manufacturers, as they use several suppliers to manufacture their products. The performance in relation to the quality and delivery was evaluated as they are key aspects of the operational performance of industries from the automobile sector.

A survey was executed in the 100 largest automotive parts manufacturers, as defined by *Sindipeças / Abipeças – Performance of the Automotive Parts Sector* (2009-2010). A Likert scale questionnaire was used as instrument of research, developed from the theoretical referential, which was sent to the managers of the supplier relationship areas of these companies.

In the next chapters, we will present the theoretical referential on which this research was based, the methodology adopted, the results obtained, analysis, and conclusions.

THEORETICAL REFERENTIAL

Companies of a supply chain keep a narrow relationship among themselves on account of their businesses. The supply operations lead to common interest, in which the client company needs a reliable supplier and the supplying company needs business opportunities. The current trend of vertical disintegration, outsourcing, reduction of supplier base, “just-in-time” supply, and partnerships have raised a larger interest in establishing good relations among companies (HARLAND, 1996). Therefore, Supply Chain Management represents the management of relationships among companies, and establishing a partnership relation means to invest in successful relationships (MENTZER et al., 2000).

Supplier Relationship Management – SRM is the business process which provides the structure of how the relationships with suppliers are developed and maintained (LAMBERT; SCHWIETERMAN, 2012).

As mentioned by several authors such as Swink et al. (2007), Singh and Power (2009), Flynn et al. (2010), significant benefits can be obtained through a good relationship with the suppliers, and the integration of operations with them can improve the company's performance.

Researches, such as Lambert's (2004), demonstrate the positive effect of the implementation of SRM in the companies' performance, but it also shows that applying SRM is still a little explored issue in a holistic way.

Some studies have examined the relations between SRM practices and the companies' performance. These studies usually show that these practices have positive and significant effects on the companies' operational and financial performances. However, several of these studies suppose that companies need to implement a wide range of practices to meet their objectives to improve performance, not detailing the results that can be achieved with the individual application of specific practices (PRAJOGO et al., 2012).

Chen and Paulraj (2004) are pioneers who developed a research structure and indicators for SRM practices. Their studies identified twelve SRM practices, including strategic purchases, long-term relationships, reduction of supply sources, logistics integrations, among others. They have significant correlation with the performance of the supply chain, involving several dimensions such as quality, cost, flexibility, response speed, and customer satisfaction.

Other researchers, such as Li et al. (2006), evaluate the effects of SRM practices and the companies' performance, considering five practices: strategic relationship with suppliers, relationship with customers, level of information exchange, quality of information exchange, and delay.

Adopting a similar study approach, Min and Mentzer (2004) matched seven practices – vision, leadership, long-term relationship, information exchange, sharing of risks and rewards, integration of processes, and cooperation – to create a set of SRM practices and show the existence of a positive relationship. This happens through a set of business performance indicators, which include product offers, availability, readiness, profitability, and growth.

Prajogo et al. (2012) highlighted in their study the evaluation of three SRM practices – long-term strategic relationship, evaluation of suppliers, and logistics integration – and their relation with four operational performance indicators, which are quality, delivery, flexibility, and cost.

Several practices focus on improving supplier management due to its importance for the success of organizations inserted in the supply chain. It is also noted that many studies evaluate the aspects of implementing a set of practices of relationship with suppliers; however, they do not evaluate the impact each of them may have regarding the main performance indicators of organizations.

METHODOLOGY

The objective of this research was to identify in which way the use of Supplier Relationship Management is related to the performance of automotive parts manufacturers through a survey, evaluating the population of the 100 largest automotive parts manufacturers in Brazil. They were classified by their turnover, according to *Sindipeças / Abipeças – Performance of the Automotive Parts Sector* (2009-2010).

The evaluation of the available literature presented in the previous item suggests that the application of the Supplier Relationship Management practices brings potential benefits that may cover key aspects of operational performance. In order to conduct the research in the automotive parts sector, the following hypothesis was established:

H1: “Conducting Supplier Relationship Management practices is positively related to the performance of quality and delivery from the suppliers of the automotive parts manufacturers”.

Method

The survey method may be described as the attainment of data or information on characteristics, actions, and opinions of a specific group of people, indicated as representative of a target population, through an instrument of research, which is usually a questionnaire. Fink (1995) states that the interest in producing quantitative descriptions of a population and using a predefined instrument of research may be mentioned as the main characteristics of the survey method. This research method was used to carry out this study as it is the most adequate to

ascertain the interviewees' opinions and attitudes, and because it allows to make projections for the population represented and to test the hypotheses raised.

To conduct this research, the most frequent practices of relationship mentioned in the literature and usually adopted in the automotive parts sector were used as reference: long-term strategic relationship, evaluation of suppliers, logistics integration, and joint execution of improvement activities.

The results of the quality and delivery of components and material purchased by the companies researched in relation to the objectives defined will be considered to evaluate the result that the application of these practices brings to the companies' performance according to the technical specification ISO TS 16949.

Research questionnaire

The research questionnaire was developed based on the studies by Prajogo et al. (2012), Chen and Paulraj (2004), Kannan and Tan (2006), and Krause et al. (2000). This questionnaire was sent by e-mail to the responsible staff of supplier management areas from the 100 largest companies of the Brazilian automotive supply chain, starting from the automakers. In other words, it was sent to the participants of the automotive parts supply chain, limited to the ones called systemists and their suppliers. The respondents were asked to evaluate each questions considering a Likert scale from 1 to 5, in which 5 means "completely agree" and 1 means "completely disagree", relating to the application of SRM practices. In the second stage of the questionnaire, the respondents were asked to indicate their suppliers' level of performance considering the following options: 3 – Performance surpasses the objectives defined, 2 – Performance meets the objectives defined, and 1 – Performance does not meet the objectives defined.

A pre-test to confirm the pertinence of the instrument of research adopted, as well as making possible corrections if necessary was carried out.

Sample

We personally identified the responsible staff of supplier management areas in processes of purchase, logistics, or supplier quality to carry out this research and 26 usable answers were obtained. The sample collected is not probabilistic because not all the elements of the researched

population have the same chance of being selected. This happened because the research answers were obtained from the companies that were willing to answer them, and executed by professionals who work in the supplier management of the companies researched, in logistics, purchase or quality of suppliers, which were available. This way, the collected sample does not allow the generalization of the conclusions obtained.

RESULTS

A linear regression analysis was applied to evaluate the results from the field research and identify in which way Supplier Relationship Management practices are related to the performance of automobile parts manufacturers. According to Hayes (2003), regression analysis is a technique recommended to evaluate the functional relation between two variables obtained through a research questionnaire, using a Likert form. For this evaluation, the average of the performance of quality and delivery obtained from each company researched will be considered as the dependent variable (Y), and the average of the evaluation of the four Supplier Relationship Management practices from each company researched as the independent variable (X), as shown in Table 1.

Table 1 – Tabulation of research data related to the score of SRM practices and the performance of the companies researched

Variables	Companies researched	
Y_i	General average SRM practices	
X_i	General average Performance	
	1	4.7
	2	4.2
	3	3.5
	4	4.6
	5	3.6
	6	4.1
	7	4.6
	8	3.6
	9	4.6
	10	3.4
	11	3.9
	12	3.6
	13	4.2
	14	4.4
	15	4.2
	16	3.7
	17	4.6
	18	3.1
	19	3.3
	20	4.3
	21	3.2
	22	3.8
	23	4.0
	24	4.2
	25	3.0
	26	3.5

Evaluating the data above, we generated a scatterplot using the statistical software Minitab 16 to present a relation between these two variables. Figure 1 presents the scatterplot with the average of SRM practices and the average of performance of the companies researched.

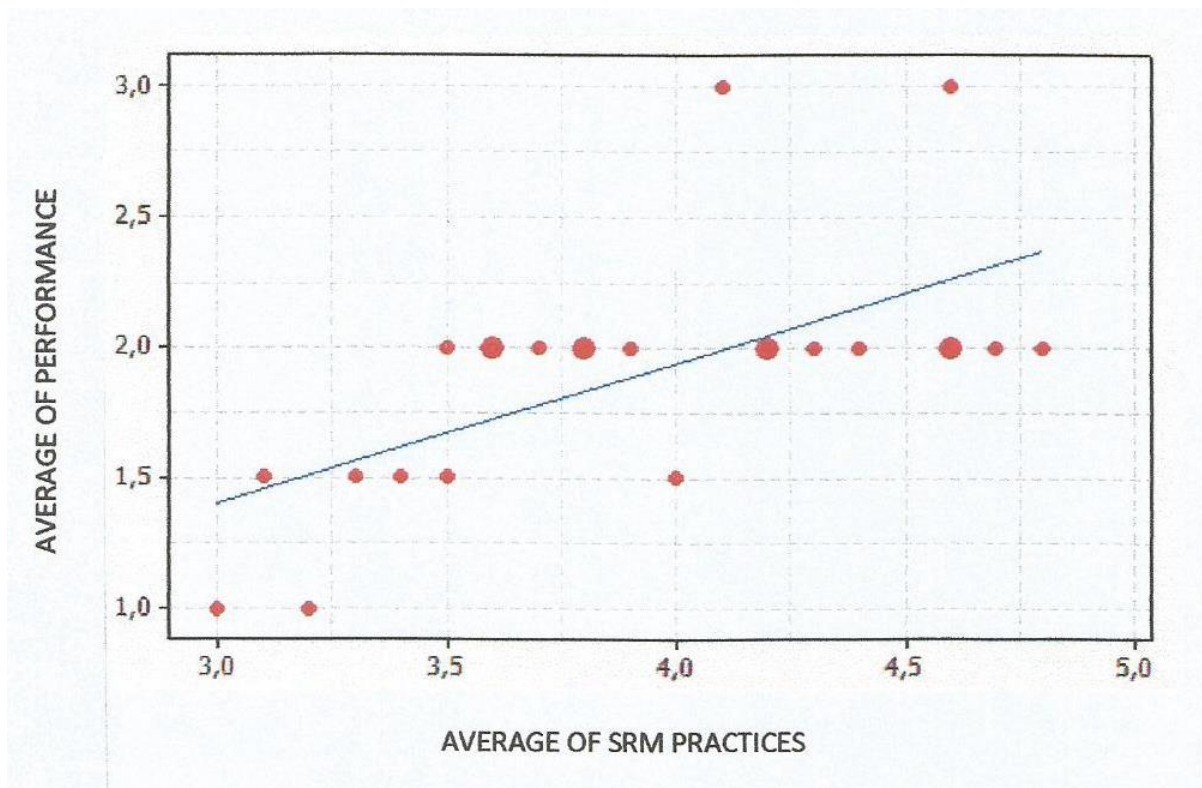


Figure 1 – Scatterplot with the average of SRM practices and the average of performance

The graphic analysis of the figure 1 shows the positive relation between the application of SRM practices and the performance of the companies which apply them. Therefore, Pearson's r index was calculated in order to confirm this evaluation, which indicates the level of relationship and the direction of the relation between the two variables. This coefficient may vary from -1, indicating a perfectly negative relation between the two variables, to 1, indicating a perfectly positive relation between the two variables.

Using the statistical software Minitab 16 to calculate Pearson's r index of the data researched, we obtain the value of $r = 0.631$, thus verifying the presence of a relation between the two variables evaluated. Due to r being a positive value and relatively high, it demonstrates the existence of a relation between the application of relationship management practices and the improvement in performance of delivery and the quality of the suppliers of the companies that apply them.

Test of the correlation coefficient

Costa Neto (1984) and Hayes (2003) highlight that we should not forget that the r index is calculated based on n elements of a random sample, and therefore it represents only one estimate of the real population correlation coefficient ρ , and that the correct interpretation of the r index is directly connected to the quantity of data with which it was calculated. The following hypothesis test is recommended to determine if the r index, calculated with a respective sample size n , allows to conclude to a given level of significance α that there is a linear correlation between the variables. This hypothesis was defined by Costa Neto (1984) and Hayes (2003):

$$H_0, \rho = 0$$

$$H_1, \rho \neq 0$$

This test can be carried out through the comparison of Student's t -value observed with $n-2$ degrees of freedom, in relation to the critical t -value, calculated as follows:

$$\text{T-value observed: } t_{n-2} = r \sqrt{(n-2) / (1-r^2)} \quad (1)$$

Applying this test to the research data, we obtain the following t -value observed:

$$t_{n-2} = 0.631 \sqrt{(26-2) / (1-0.631^2)} = 3.984$$

Analyzing the critical t -value observed in a Student's statistical table of t -distribution, considering the probability value of $p = 0.01$ and degrees of freedom $v = 24$, we obtain the critical t -value of 2.492.

As the t -value observed of 3.984 is higher than the critical t -value of 2.492 with a level of significance $p = 0.01$, we can reject the null hypothesis and affirm that there is enough evidence that the correlation is not zero. As we also know that the value of Pearson's r index = 0.631, we can then affirm that there is a positive correlation between the variables evaluated.

Therefore, we can confirm Hypothesis H1 formulated for this research, which claims that “conducting Supplier Relationship Management practices is positively related to the performance of quality and delivery from the suppliers of the automotive parts manufacturers”.

CONCLUSION

The goal of this study was to identify in which way the use of Supplier Relationship Management practices is related to the performance of automotive parts manufacturers. To do so, we carried out a bibliographic review about the relationship management with suppliers, the frequently used practices, and the indicators adopted to measure the suppliers’ performance.

It was decided to evaluate the supply chain of the automotive parts industry in Brazil due to the intensive use of suppliers to manufacture their product and complexity, technological update, and sharp growth over the last years. Another reason for this decision was the fact that it belongs to the automotive supply chain, which may be the most competitive in the manufacturing industry. A survey questionnaire was applied to conduct this research, with closed-ended questions using a Likert scale.

Analyzing the data obtained the hypothesis established for this study was confirmed. It claimed that the execution of the Supplier Relationship Management practices evaluated is positively related to the performance of quality and delivery from suppliers of automotive parts manufacturers.

Another contribution of this study was to fill a still existing gap in the literature, once it included relationship practices which had not been tested previously, such as the joint execution of improvement activities in the Brazilian automotive parts industry. However, it is important to highlight that the data from this research are not probabilistic, and they were collected by convenience. Thus, the generalization of conclusions presents limitations.

The application of Supplier Relationship Management practices is important to manage industrial companies that wish to obtain expressive results when supplying their products and services, and systematically achieving the objectives of the parts interested in the business. Among them, we can mention businesses that intend to receive products and services with quality and on time, suppliers that seek profitable and long-term relationships with their

customers, and also business owners and stakeholders who need to have a profitable company in the short and long-run.

BIBLIOGRAPHY

- Costa Neto, P. L. 1984. *Estatística*. Edgard Blucher, São Paulo.
- Croxton, K. L.; Garcia-Dastugue, S. J.; Lambert, D. M. 2001. The supply chain management processes. *The International Journal of Logistics Management* **12**(2):13-36.
- Chen, I.J.; Paulraj, A. 2004. Towards a theory of supply chain management: the constructs and measurements. *Journal of Operations Management* **22**(2): 119–150.
- Fink, A. 1995. *The Survey Handbook*. Thousand Oaks, Sage.
- Flynn, B.B.; Huo, B.; Zhao, X. 2010. The impact of supply chain integration on performance: a contingency and configuration approach. *Journal of Operations Management* **28**(1): 58-71.
- Harland, C.M. 1996. Supply chain management: relationships, chains and network. *British Journal of Management* **7**.
- Hayes, B.E. 2003. *Medindo a satisfação do cliente – Desenvolvimento e uso de questionários*. Qualitymark, Rio de Janeiro.
- International Automotive Task Force. 2009. *ISO/TS 16949:2009: quality management system*. IATF, Geneve.
- Kannan, V.R.; Tan, K.C. 2006. Supplier selection and assessment: their impact on business performance. *Journal of Supply Chain Management* **35**(4): 11–21.
- Krause, D.R.; Scannell, T.V.; Calantone, R.J. 2000. A structural analysis of the effectiveness of buying firms' strategies to improve supplier performance. *Decision Sciences* **31**(1): 33–55.
- Lambert, D. M; Cooper, M.C; Pagh, J. D. 1998. Supply Chain Management: Implementation Issues and Research Opportunities. *International Journal of Logistics Management* **9**(2).
- Lambert, D. M. 2004. The Essential. *Supply Chain Management Review* **8**(6): 18-26.
- Lambert, D.M.; Schwieterman, M.A. 2012. Supplier relationship management as a macro business process. *Supply Chain Management: An International Journal* **7**(3): 337–352.
- Li, S.; Ragu-Nathan, B.; Ragu-Nathan, T.S.; Rao, S.S. 2006. The impact of supply chain management practices on competitive advantage and organizational performance. *Omega* **34**(2): 107–124.
- Mentzer, J. T. et al. 2000. The nature of interfirm partnership in supply chain management. *Journal of Retailing* **76**(4).
- Min, S.; Mentzer J. 2004. Development and measuring supply chain management concepts. *Journal of Business Logistics* **25**(1): 63-100.
- Prajogo, D.; Chowdhury, M.; Yeung, A.C. L.; Cheng, T.C.E. 2012. The relationship between supplier management and firm's operational performance: A multi-dimensional perspective. *International Journal of Production Economics* **136**: 123–130.
- Singh, P.; Power, D. 2009. The nature and effectiveness of collaboration between firms, their customers and suppliers: a supply chain perspective. *Supply Chain Management: An International Journal* **14**(3): 189-200.
- Swink, M.; Narasimhan, R.; Wang, C. 2007. Managing beyond the factory walls: effects of four types of strategic integration on manufacturing plant performance. *Journal of Operations Management* **25**(1): 148-164.