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Trade-off in the decision-making process: research with logistics area

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Abstract

With the growing need to provide quality and its clients, the entities have invested more and more in their area of logistics and expanded the features. From the initial priority in caring for the purchasing process, storage of materials, operational control, inventory of their products, and finally the delivery of the product to the customer, the logistics area has modernized with the growing activities and today it has information systems that help to operationalize all its functions. In order to understand if the whole logistics process brings benefits to the entity, the present study analyzed whether the managers of the logistics areas of different companies, know, make use of and evaluate the trade-offs before the decision. For this, a questionnaire was carried out with 225 managers from the logistics area of different companies, being these micro, small and medium sized companies. The result demonstrated little knowledge about the trade-off term and as a result little knowledge about the features and earnings that companies can provide. Few make use of cost simulators and most do not have access to economic- financial institutions of the entities in which they operate, and although they are managers, have no possibility of optimizing results at the moment of decision making.

Keywords: Trade-off . Logistics. Decision-making process.

Introduction

The responsibilities of the logistics area have grown over the years. Before seen as a department with internal functionalities within an organizational structure, the logistics sector today has attributions that directly impact the company's results. The

managers saw the sector as a simple cost center and did not have no importance for doing business (Novaes, 2001).

The growth and improvement of the tools that the sector makes use of as a information, assist in the entire process of data collection and replaces the figure of the manager at the time of decision making.

With so many attributions given to the logistics sector Aur & Bouzada (2009), they comment on the importance and urgency in training the logistics professional, as I believe in the great growth potential and qualified professionals can generate entities and to Brazil. The manager who is part of this process has to be efficient in evaluating the exact point of benefit to the company between the cost and level of service or product delivered to the client (Faria & Costa, 2008).

Corroborating with the action of man, facing participation in the logistics process Moura & Beuren, (2003) point out that logistics began with primitive man by having to moving their food excesses elsewhere. With this occurred the evolution that brought the need to use technological means.

Between 1960 and 1970 the concept of Logistics Costs the evolution of computers, research on the subject and the market economy suffering changes. From this time on, a relationship between all costs and possibility of the occurrence of the trade-offs that came to be known as trade compensatory (Faria & Costa, 2008).

In the following decade Gonzales (2002) comments that in the 70's and 80's the logistics area concerned with its activities within an organizational structure only and in the decades of the 1980s and 1990s, with the advent of globalization and growing need for meet the demanding customer in a more efficient way, the concepts of transport and changes were made by the managers involved in the process. For Faria & Costa, (2008) was a phase where the main concern was about the concern about the reduction of costs.

Based on this reality, the present study intends to verify the use that the responsible manager of the The logistics industry makes the information it has and evaluates it before taking a decision. In order to answer the following question: What are the opinions of the logistics managers on the benefits generated by the logistics process for the entities? What are the real benefits an entity derives from making a particular choice, function of another option?

The objective of the present study is to know the opinions of the managers of the logistics different companies, know about the practice of trade-offs in the process of making decision. A questionnaire was conducted with 225 respondents who hold the positions of managers of the area, such as the positions of Directors, Managers or Supervisors in the logistics area of different companies, being these micro and small and medium sized companies.

The present article has as contribution to clarify the differences in the micro-enterprises, small and medium- sized enterprises questionnaire proposed in a study by Amaral and Guerreiro (2014), which was applied to companies listed by the Exame Magazine Biggest and Best of the base year of 2010. In this authors consulted 659 companies, according to the authors, but they of 73 companies.

Review of Literature

Logistics

Several assignments have been granted to the logistics area over the years. From the new reality, logistics came to be conceptualized as the person responsible for the coordination of storage, transportation, storage, inventory control and product to the final destination, the customer (Chiavenato, 1991). In this way, the objective of to realize the flow of the product from the beginning to the end of the productive process of an entity (Ballou, 1993).

Paoleschi (2009), logistics fulfills a mission by contributing directly to the entity when they have a product in place, time and conditions.

Strategically (Christopher, 1997) logistics is useful in acquiring, moving and materials, with the focus on increasing the entity's profitability.

It should also be given to logistics, the need to (Ching, 1999), so it will be possible to coordinate where the materials are stored and the amount of inventory present.

The term system-assisted logistics occurred in 1980, with the creation of ERP (*Enterprise Resourses Planning*), designed to assist in the planning and administration of the data of the companies and with that it was possible to integrate the production to the system of the company (Paoleschi, 2009).

Bowersox; Closs, Cooper (2007) has the function of transporting and positioning the material within any supply chain and for keeping that organization in determines the product. Additionally, the authors corroborate that such a logistical process contributes to the productive capacity of a nation.

Among the professionals in the area is the dissemination of the concept given by the Council of Logistics Management (2005) North American:

> Logistics is the process of planning, implementing, and controlling efficient flow and storage of products, as well as the services and associated information, covering from the point of origin to the point of consumption, in order to meet consumer requirements.

Today, the growing need for unity among all part of the supply chain (Faria, Costa, 2008).

According to Novaes (2004) the main function of logistics is with the production chain, as this is capable of "adding value of place, time, quality and information to the productive chain" and as a consequence the inevitable integration with the customer and supplier, giving the name of Supply Chain to this process.

In a complementary way, Gonzales (2002) associates logistics with the supply chain, moment of purchase of the raw material until delivery of the finished product to the consumer end "by giving greater efficiency to the flow of costs.

Trade-offs

According to Monteiro, Vianna & Filho (2003), new *trade-offs* have emerged with challenging managers to rethink and develop, through decision-making, the chain of supply. When the manager seeks the best decision for the entity, it has at his disposal interdependent information, whose values change according to the alternatives that have in front of it, and it is at this moment that one has the *trade-off* (Faria &

Costa 2008).

According to Logistics Report n.26 of the Logistics Studies Center - CEL (2000) of the Coppead Institute of Administration - UFRJ,

> often states that a *trade-off* occurs when cost in a particular activity are more than offset by reductions in another activity.

Meireles, Sanches, & Positivo (2009) understand that the *trade-off* term is associated with different concepts, but mainly from the point of view of having a *trade-off* when making a exchange, in the sense of having one thing or another. They complement by associating the term with perception of the priority people have when making the exchange.

For Faria and Costa (2008) *trade-offs* are "compensatory *trade-offs* between elements of costs, in the calculation of the Total Logistic Cost ".

Myers (1984) understands that *trade-off* is a response to a company that wants to have an optimal structure increase in benefits and decrease in borrowing costs.

According to Morabito (2008), the term *trade-off* brings an analysis from the point of view of obtaining a advantages over another. In addition, the author emphasizes that many authors approached the theme with the intention of knowing the best and for that they realized much qualitative rather than quantitative research, such as the absence of calculations measure of performance and allocation of resources. Believes that the process of making decision on a project should have the *trade-off* as an important point to be considered, especially when it comes to the choice of products, technologies, equipment and capacity.

A *trade-off* analysis that can be considered viable, according to the authors Bowersox; Closs, (1996), is to determine the discount obtained in the transaction and together assess the cost necessary to keep stock. If an optimum benefit is perceived, in this case a option.

According to Wanke and Fleury (1999), one must take into account the segment that entity is part, since the demand justifies the cost of maintaining the stock, which may impair the need for resupply and may cause losses to the entity.

Morabito (2008) points out that the authors do not relate stock size to performance of the company, since there is no certainty in this strategy of an increase in the entity. If so, it would be a unique strategy, followed by all entities.

Previous Searches

The professionals of today, regardless of the area they work in, need recycling in their knowledge in order to improve their professional performance in the function they occupy.

Myers et al. (2004), recognize that the process of constant learning in the logistics help the constant challenges of the area. This theory was used as one of the hypotheses of work performed by Amaral and Guerreiro (2014).

In a study conducted by Amaral and Guerreiro (2014) on this subject, 73 professionals from commercial and industrial companies who were in the Best and Greatest Exame Magazine of the base year of 2010. After applying a questionnaire and quantitative analyzes of the data, the authors concluded that "most of the logistic professionals is aware of the existence of compensatory exchanges and knows that

the increase can be offset by increased revenues or other costs ".

Additionally, the authors approached the greater knowledge about the subject by professionals with more years of activity in the logistics area, and that these see with greater importance the impacts that the economic- financial aspects have at the moment of of decision-making, relating the *trade-off* .

Methodology

This is a descriptive research with an analytical approach in which 225 respondents who they hold the positions of Directors, Managers or Supervisors of the logistics area belonging to microenterprises and small and medium enterprises of different activities responded to questionnaire on the theme of *trade-off* adapted from research conducted by Amaral, Guerreiro (2014).

The use of a questionnaire as a form of data collection (*survey),* "ensures better and generalizability for a broader population "(Günther, 2003).

For analysis of the data, the described statistic was used in order to organize, summarize and describe the obtained data, helping to understand the behavior of the variables (Martins & Theophilos, 2016).

To evaluate the dispersion of one variable in relation to another, we used the statistical technique of standard deviation (Martins & Theóphilo, 2016) and the arithmetic average technique, for "be able to summarize a series of data, with the presentation of one or more values that are representative of the whole series "(Fávero et al, 2009).

Avaliation

For Amaral & Guerreiro (2014), logistics cost *trade-offs* follow concepts of Myers et al. (2004) and Lambert and Armitage (1979), which deal with the existence of a *trade-off* and its relation to the total logistic cost of a product and were used as the basis for the of the questionnaire. The five-point Likert scale in order to present various options for the respondents (table 1).

In the first question of Table 1, the name was extracted vice versa, in order not to generate doubts to the respondent.

For Bio (2001) the optimal solution is the result of the equilibrium of a result from a Great service with minimal cost required.

The concept of total cost is based on the relation of all costs related to the processes supply, production and distribution (Copacino, 1997).

According to Faria & Costa (2008) the concept of total logistic cost assists in the whole process decision- making process by conducting a detailed analysis of the entire logistic macroprocess.

Table 1 - Knowledge variables of logistics cost trade-offs

Variable	Question	Scale	References
(1)	In your company, is spread the idea that, due to the existence of compensatory cost changes, the increase in the cost of a logistics activity is offset by the increase in revenues?	5 = Idea is fully disseminated 1 = Idea is not disseminated	Lambert & Armitage (1979)
(2a)	In your company it is disseminated the idea that individual costs may increase the total cost of logistic		Lambert & Armitage (1979)
(2b)	In your company is disseminated the idea that formation of the total logistic cost is determined by the compensatory cost changes?		Lambert & Armitage (1979)
(3)	In your company it is disseminated the idea that impacts the economic-financial performance of company		Christopher & Ryals (1999); Presutti & Mawhinney (2007)

Source: Adapted from Amaral & Guerreiro (2014)

For Amaral & Guerreiro (2014), the second part of the questionnaire started from the initial idea of possibility of an incomplete analysis on *trade-off.*

The questionnaire was delineated with concerns of (1) Evaluation of the *trade-off* level of services versus total cost; (2) Evaluation of *trade-offs* of relevant costs; (3) Impacts economic-financial *trade-off;* (4) Systematic assessment of the total cost of the network and (5) Deliberation of the solution that optimizes the total cost (table 2).

Table 2 - Variables of the evaluation of trade-offs of logistics costs

Variable	Question	Scale	References
(1a)	In formulating logistics solutions (of various amplitudes) are carried out analyzes of the total cost logistic *versus* the level of customer service, that is, the total costs are simulated in relation to the levels possible to be offered?	5 = are widely performed and 1 = no are performed	Christopher (1987)
(1b)	The logistics network of your company and / or the logistics processes (supply, logistics of factory, distribution) were the objects of studies to to increase the levels of service offered to customers at the lowest total cost possible?	5 = are widely studied and 1 = no are studied	Christopher (1987); Group & Cypress (1993)
(2)	In formulating logistics solutions (of various amplitudes) the exchanges are identified and analyzed the most relevant cost-sharing	5 = are widely identified and 1 = no are identi-	Lambert & Armitage (1979); Faria, Bio & Robles

	measures?	fied	(2004)
(3a)	In formulating logistics solutions (of various amplitudes), simulations and analyzes of the economic and financial impacts resulting from different levels of service?	5 = are widely performed and 1 = no are performed	LeKashman & Stolle (1965); Mak & Shen (2010)
(3b)	In formulating logistics solutions (of various amplitudes), simulations and analyzes of the economic and financial impacts of the most relevant cost-sharing measures?	5 = are widely performed 1 = no are performed	LeKashman &Stolle (1965); Mak & Shen (2010)
(4)	They are carried out, systematically and routinely, assessments of the total cost of logistics processes and of the logistics network in relation to the level of service offered to customers?	5 = are widely performed 1 = no are performed	LeKashman & Stolle (1965); Chow (2008)
(5a)	The selected logistics solution is necessarily that optimizes economic performance and of the company?	5 = It is necessarily 1 = no It is necessarily	LeKashman & Stolle (1965); Faria (2003); Faria & Costa (2005)
(5b)	The logistics network and / or the macro logistics processes of your company are already at full optimized cost, or they already operate with the lowest total cost possible in level of customer service established?	5 = are with the optimized cost 1 = they are not with optimized cost	LeKashman & Stolle (1965); Faria (2003); Faria & Costa (2005)

Source: Adapted from Amaral & Guerreiro (2014)

In Table 3, Amaral & Guerreiro (2014) presented the experience and formal education of professionals

Table 3 - Variables of the experience and the formal education of the logistic professional

Variable	***Question***	***Scale***	***References***
Experience of professional logistic	Time experience in logistics	1 = up to 2 years; 2 = 3 to 5 years; 3 = 6 to 10 years; 4 = From 11 to 15 years; 5 = More than 16 years	Slone, Mentzer, & Dittmann (2007); Myers et al. (2004)
Formal education of the professional logistic	Degree of education formal	1 = High school / technical; 2 = Higher Education; 3 = Specialization / MBA; 4 = Masters and Doctorate	

Source: Adapted from Amaral & Guerreiro (2014)

Table 4, Amaral & Guerreiro (2014), question whether the professionals consulted do use of cost simulators and if they receive accounting information from the controlling area of the their companies.

Table 4 - Variables of the use of cost simulators and the adequacy of information accounting

Variable	***Question***	***Scale***	***References***
Utilization of cost simulators	In the design of logistics solutions, used total cost simulators for logistics network and / or cost simulators total for logistics projects?	1 = Yes or 2 = No	Russell & Cooper (1992)
Adequacy of information accounting	The information received from the Controllers help to clear compensatory costs necessary for the measurement of the total logistic cost? The information received from the Controllers help to formulate the logistics solutions?	5 = Help totally 1 = No help	Lambert & Quinn (1981); Tyndall & Busher (1985); Faria (2003)

Source: Adapted from Amaral & Guerreiro (2014)

A questionnaire adapted to the points addressed by Amaral & Warrior (2014). The adjustments were made so that the questions did not generate doubts by the respondents and for this were subtracted terms like "and" and also the terms "or" present in some questions.

Treatment and Analysis of Data

Part I

The sample encompassed companies of different activities and different sizes.

According to the criterion of evaluation of the size of a company for Brazilian industries, considered to be microenterprises with up to 19 registered employees. 20 to 99 the company is considered small. From 100 to 499 employees are classified as medium-sized and above this, are considered to be large.

On the other hand, the companies that operate in the activities of commerce and services, are considered companies with up to 9 registered employees. From 10 to 49 employees company is considered small. From 50 to 99 employees are classified as medium and above this classification, are considered large.

The representatives of the companies consulted were classified, in accordance with the in Table 5.

Table 5 - Portages of the companies.

Ranking	**Industry**	**%**	**Trade**	**%**	**Total**	**%**
Micro enterprise	12	20,00%	51	30,91%	63	28,00%
Small size	13	21,67%	53	32,12%	66	29,33%
Midsize	35	58,33%	61	36,97%	96	42,67%
Large	0	0,00%	0	0,00%	0	0,00%
Total	60	100%	165	100%	225	100%

Source: Authors

A total of 370 Brazilian companies were selected for ease of access organizational structure the logistics sector, not being part of this selection the companies characterized as service providers.

According to Amaral and Guerreiro (2014) the *trade-off* the "absence of the transfer of goods restricts the variety of logistic activities carried out and limits the amount of *trade-offs* faced by companies ".

Of the 370 questionnaires delivered, 225 valid responses were received, which of return in 60.81%.

In order to make contact with the different companies, students of a technology course in Logistics provided by an IES located in São Paulo, working in the area of logistics, were selected and received the questionnaire.

They delivered the questionnaires to their managers and carried out the collection in the period of April 24 on May 15, 2017.

Respondents occupy the positions of Directors, Managers or Supervisor, according to table 6.

Table 6 - Occupations of Logistics Sector Managers

Position	Number of respondents	%
Director	25	11,11%
Manager	48	21,33%
Supervisor	152	67,56%
Total	225	100,00%

Source: Authors

Part II

The descriptive statistics of the data were used in order to evaluate the correct answers.

In order to create a comparability with the work done by Amaral and Guerreiro (2014) two analysis groups were separated, which, according to the authors, would be important for the interpretation of the data.

The first group treated the weak and medium results (managers who scored 1, 2 and 3 in the and another group with the strong points (managers who pointed out 4 and 5 in the presented), according to table 7.

Table 7 - Groups formed for analysis of results

Experience	Degree of education formal	Use cost simulators	Adequacy of information accounting
Experienced (163): More than 5 years of experience in logistics	Highest degree of formal education (36): Postgraduate	It uses cost (28): There is use of simulators	Receives accounting information (73): Average greater than 3 questions on the adequacy of accounting information
Not experienced (62): Up to 5 years of experience in logistics	Lower degree of formal education (189): Medium, technical and higher	Does not use simulators of cost (197): There are no use of simulators	Receives accounting information inadequate (152): Average less than 3 questions on the adequacy of accounting information

Source: Adapted from Amaral & Guerreiro (2014) according to the search results.

Results

The first verified data form the profile of the managers.

Most managers have over 3 years of experience in the area, of which 44%

are experience over 10 years; Regarding the level of education, half completed the and 10% completed postgraduate studies.

According to the analysis, the managers present experience and training compatible with the they occupy, according to table 8.

Table 8 - Characterization of managers

Experience in logistics	%	Degree of formal education	%
Over 10 years	44%	Postgraduate	10%
From 3 to 10 years	41%	Higher education	26%
Up to 2 years	15%	High School / Technical	64%

Source: Authors

In the survey conducted by Amaral and Guerreiro (2014), 48% of respondents had more than 10 years of experience and 42% with experience between 3 and 10 years. In relation to the degree of education, 70% had completed postgraduate studies and 22% had completed higher education.

Demonstrating that in large companies managers, most of them have more time to experience and has superior training to micro-enterprise managers, small and medium-sized medium sized Table 9 deals with the scores presented in the collection of information on the knowledge that managers have about *trade-offs.*

Table 9 - Levels of scores marked the questions of knowledge of the trade-offs of logistics costs

Variable	Levels of marked scores	
	Weak or Medium (1,2 or 3)	Strong (4 or 5)
(3) Knowledge of economic and financial impacts	30%	70%
(1) Knowledge of *trade-offs*	49%	51%
(2) Knowledge of the relation of the *trade-offs* with the total cost (variable 2b)	67%	33%
(2) Knowledge of the relation of the *trade-offs* with the total cost	67%	33%

Source: Authors

According to the data collected, it can be seen that 70% of managers know that the logistics directly impacts the economic and financial areas of the entity they operate, showing an overview of the area they operate, corroborating with Christopher (1997), recognize its importance in increasing the company's profitability.

In relation to the second point addressed only slightly more than half of the managers (51%) reported high scores (4 and 5) for the knowledge that if there is an increase in cost in the sector they work, this can be compensated in another activity within the same Department. Or, there may be a cost increase, but also a revenue from this.

As in the research by Amaral and Guerreiro (2014), the next two points that knowledge of the *trade-offs relation* with the total cost, the research pointed to a low index of knowledge about it. Only 33% say they know the direct relationship be-

tween the terms, which demonstrates the lack of disclosure and possible lack of disclosure or about the subject.

In general, logistics managers know the importance of their relate this knowledge to the possibility of making use of the *trade-offs* and with that improve the results of the entities that act.

In the table 10 deals with *trade-offs* evaluations of logistic costs.

Table 10 - Levels of scores marked theuestions of the evaluation of the cost trade-offs logistic

Variable	Levels of marked scores	
	Weak or Medium (1,2 or 3)	Strong (4 or 5)
(1b) Evaluation of *trade-off* service level versus total cost in network design and logistical processes	30%	70%
(4) Systematic evaluation of total network and process costs logistic	25%	75%
(2) Evaluation of relevant cost *trade-offs*	49%	51%
(3a) Evaluation of the economic-financial impacts of the *trade-off* level of service versus total cost	55%	45%
(1a) Evaluation of *trade-off* service level versus total cost in specific project solutions	30%	70%
(3b) Evaluation of the economic-financial impacts of *trade-offs* relevant costs	51%	49%
(5b) Optimization of total network cost and / or logistic processes	55%	45%
(5a) Deliberation of the solution that optimizes the total cost.	65%	35%

Source: Authors

According to the results presented in table 10, the *trade-off* in relation to network and logistics processes (questions 1b and 4), and know evaluate the level of service versus total cost in specific project solutions (question 3), corroborating with Faria & Costa (2008), when recognizing its importance as an is part of the company's strategy.

With regard to the relevant cost, slightly more than half of the managers pointed to confirming the importance of the topic in the composition of relevant costs of the entity thatwork.

In the two questions about the economic-financial impacts, the majority of managers do not assess the relevance of the *trade-off* at the service level or its impact on the total cost.

Showing little knowledge about the functionality of terms in managing results. But the most relevant answer is whether the solution given to the problems themselves, the managers. They point out that their decisions do not always present an optimal result for their undertakings, ie 65% do not assess this possibility at the time the decision is taken, since 55% do not allow the optimization of the total cost in the sectors thatact.

The only points that presented different relevance in the work of Amaral and

Guerreiro (2014) were questions 3a and 3b.

In question 3a 53% considered that there is a high impact of economic-of the *trade-off* in relation to the total cost, while the survey carried out in microenterprises, small and medium size, this item was relevant only to 45%. In the matter 3b, which also deals with the impact of economic-financial information on the *trade-off,* in the relevant costs, 51% of respondents from large companies consider relevant, while the other 49% companies consider this as important.

The following table reports frequencies in relation to the level of experience of managers who work in the Logistics area.

Table 11 - Frequencies of the scores reported by experienced professionals and not experienced

Variable	Experienced		Not experienced	
	Weak or Medium (1,2 or 3)	Strong (4 or 5)	Weak or Medium (1,2 or 3)	Strong (4 or 5)
Knowledge of impacts econom-ic-financial	25%	75%	35%	65%

Source: Authors

In table 11, there is a clear demonstration that more experienced managers have greater knowledge (75%) about the impacts that the sector has on the economy and finance of the entity, than non-professionals who are not experienced, corroborating with the point of view of Faria & Costa (2008) who claim that the manager should be part of the whole process.

In the study by Amaral and Guerreiro (2014), this result is 82% of the respondents. In the table 12, initially part of the information that 65% of companies do not use simulators.

Table 12 - Use of Simulators

Variable	Frequency of scores for groups			
	Use simulators		Does not use simulators	
	Weak or Medium (1,2 or 3)	Strong (4 or 5)	Weak or Medium (1,2 or 3)	Strong (4 or 5)
(1a) Evaluation of the *trade-off* level of service versus total cost specific projects	40%	60%	60%	40%
(3a) Evaluation of the economic-of the *trade- off* level of service versus total cost	40%	60%	60%	40%
(5a) Deliberation of the solution that optimizes the total cost	25%	75%	65%	35%
(1b) Evaluation of the *trade-off* level of service versus total cost in the design of network and logistics processes	40%	60%	60%	40%
(3b) Evaluation of the economic-the financial *trade-offs* of cost relevant	30%	70%	70%	30%

(4) Systematic evaluation of total cost network and logistical processes (5b)	49%	51%	65%	35%
(5b) Optimization of total network cost and / or logistical processes	49%	51%	65%	35%
(2) Evaluation of *trade-offs* cost relevant	25%	75%	60%	40%

Source: Authors

It is possible to show that area managers using simulators have better clarity on the evaluation of the trade- off , in a broad way. They recognize that costs are needed and are used both in projects and in their design network.

According to Moreira, Vianna & Filho (2003), this is a way of rethinking the supply and reach a development in the decisions.

Regarding the companies that do not use simulators, they had answers presented in the score weak or medium. According to Aur & Bouzada (2009), there is a need to conduct trainings the people who work in the area of logistics, because they belong to a segment that comes growing in recent years. Especially with the creation of systems (Paoleschi 2009) and the need to operationalize it (Ching, 1999).

The same analyzes were evidenced in the study by Amaral and Guerreiro (2014), although the questionnaire has been applied to large companies and other percentages. Table 13 deals with the accounting information variable.

Table 13 - Receipt of accounting information

Variable	%
Do not receive accounting information	53%
They receive inadequate accounting information	27%
Receive adequate accounting information	20%

Source: Authors

With the result of the research it is evident that according to the managers, the companies do not transfer the information cleared by their accounting and controlling logistics sector. This makes it difficult for the logistics manager to impact its decisions have on the entity's economy and finances. Even managers recognizing that the logistics area helps in the composition of the company's profit (Christopher, 1997).

In the study by Amaral and Guerreiro (2014), 30% receive adequate accounting information, while 27% receive inadequate information, which makes up a total of 57% of large companies, while in smaller companies it was found that 47% 20% are adequate and 27% are not adequate. This shows that transfer information from one sector to another in order to in the decision-making process, they still have a large part that do not and more than half of smaller companies need to start the practice of better communication between the sectors of the entity.

Table 14 shows the results obtained in relation to the accounting information, if these whether or not they impact the assessment of logistics cost *trade-offs*.

Table 14 - Adequate information

Variable	Frequency of scores for groups			
	Appropriate information		Unsuitable information	
	Weak or Medium (1,2 or 3)	Strong (4 or 5)	Weak or Medium (1,2 or 3)	Strong (4 or 5)
(3a) Evaluation of the economic-of the *trade-off* level of service versus total cost	30 %	70%	65%	35 %
(1b) Evaluation of the *trade-off* level of service versus total cost in the design of network and logistics processes	25 %	75%	60%	40 %
(2) Evaluation of *trade-offs* cost relevant	30 %	70%	65%	35 %
(1a) Evaluation of the *trade-off* level of service versus total cost specific projects	25 %	75%	65%	35 %
(4) Systematic evaluation of total cost network and logistical processes	25 %	75%	60%	40 %
(5a) Deliberation of the solution that optimizes the total cost	25 %	75%	60%	40 %
(3b) Evaluation of the economic-the financial *trade-offs* of cost relevant	25 %	75%	60%	40 %
(5b) Optimization of total network cost and / or logistical processes	25 %	75%	65%	35 %

Source: Authors

You can verify that the information when received by the managers of the Finance area is appropriate, they impact significantly on the assessment of the *trade-off*. And when information is not adequate, there is the opposite behavior on the part of the managers. O which is easy to understand because the information received and its level of quality has direct impact on the decision-making process of any entity (Faria & Costa, 2008).

Often information is not transferred to sectors such as logistics, consider the relevance that companies and their managers give to this sector and the cost of their maintenance (Wanke & Fleury, 1999).

In questions 1b, 2 and 4 of table 14, in relation to the inadequate information the results pointed out by this research were divergent from the results obtained by Amaral and Warrior (2014). In the three questions the scores were higher in the strong responses (4 or 5) and than in weak or medium responses (1, 2 or 3), which demonstrates that information on the total costs, relevant costs and total cost of the network and processes, has low relevance in trade off evaluation.

Conclusions

The objective of this article is to know the opinions of the logistics managers about the benefits generated by the logistics process in micro-enterprises, small and medium sized.

According to the data collected and the analyzes made it was possible to show that the objective was achieved by responding to the level of knowledge of the respondents on the subject of *trade-off* , its importance and evaluation within the organizations that act, although only 12.44% of managers make use of cost simulators.

Based on the survey data, 32.44% receive or have access to accounting information, the which means that managers do not have many means or data to assist them in decision-making.

However, when the same managers receive information from These may be considered adequate or inadequate. When considered impact on the assessment of the *trade-off* , and when are inadequate, there is the opposite behavior on the part of the managers. What is easy to understand the information received and its level of quality has a direct impact on the decision-making process of any entity.

Regarding the knowledge of the relationship between *trade-offs* and total cost, only 33% to know the direct relationship between the terms, which demonstrates the lack of disclosure and possible lack of interest in the topic.

A little more than half of the managers pointed out the relevant costs as important in cost composition of the working entity.

Regarding the solutions given to the entity's problems, 65% of managers pointed out that their decisions are not always optimal for their companies, and 55% do not optimization of the total cost in the sectors that operate.

Managers generally recognize the need to use their network of design. They presented better clarity on the evaluation of the *trade-off* , in a wide way.

As a suggestion for future research, we propose to carry out studies on the education and training of the people involved in the Logistics area, taking into account the need for continued education in the sector, in order to increase knowledge on the *trade-off* and its utilities in management, in all sizes ofcompanies.

In addition, we propose that simulator models for respondents in order to be aware of and understand the usefulness of the mechanism at the decision-making process. This will allow you to determine if there were changes in costs (gain or loss) in the moment of choice for one proceeding as a result of another.

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