



Quality management and sustainability in logistics service providers: case study in brazilian company

Gestão da qualidade e sustentabilidade em prestadores de serviços logísticos: estudo de caso em empresa brasileira

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ABSTRACT

Logistics operators have become important agents in supply chains, due to the current trend of outsourcing logistical activities by companies. In this way, the level of quality of the services provided is an important aspect for the competitiveness of companies. In addition, the sustainability aspect has become relevant, given the environmental impact caused by logistics activities. Studies have shown that there are points of convergence between quality management approaches and sustainable practices. The objective of this work was to analyze aspects of quality management and sustainability in Brazilian logistics operators, from the perspective of the company contracting these services. To this end, a case study was conducted at a large company that outsources its logistics activities. The five main logistics operators providing services to the company were considered. The analysis was carried out on the basis of a model that integrates sustainability and quality management criteria. Quality assets, processes and dimensions were considered. It was found that the contracted logistics operators have a wide portfolio of services offered, quality assets and well-defined processes. However, sustainability practices are still in their infancy.

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RESUMO

Os operadores logísticos têm se tornado agentes importantes nas cadeias de suprimentos, em função da tendência atual de terceirização das atividades logísticas pelas empresas. Dessa forma, o nível de qualidade dos serviços prestados é um aspecto importante para a competitividade das empresas. Além disso, aspecto de sustentabilidade tem se tornado relevantes, dado o impacto ambiental causado pelas atividades logísticas. Estudos têm demonstrado que existem pontos de convergência entre as abordagens de gestão da qualidade e as práticas sustentáveis. O objetivo deste trabalho foi analisar aspectos de gestão qualidade e sustentabilidade em operadores logísticos brasileiros, sob a ótica da empresa contratante desses serviços. Para isso, realizou-se um estudo de caso em uma grande empresa que terceiriza suas atividades logísticas. Considerou-se os cinco principais operadores logísticos que prestam serviços à empresa. A análise foi feita com base em um modelo que integra critérios de sustentabilidade e gestão da qualidade. Foram considerados os ativos, processos e dimensões de qualidade. Verificou-se que os operadores logísticos contratados possuem um vasto portfólio de serviços oferecidos, ativos de qualidade e processos bem definidos. Porém, as práticas voltadas à sustentabilidade ainda são incipientes.

Palavras-chave: Prestadores de Serviços Logísticos. Gestão da Qualidade. Operadores Logísticos. Sustentabilidade. Modelo de Avaliação da Gestão da Qualidade. Sustentabilidade.

Introduction

In the current context, the sustainability aspect has gained competitive importance for companies. This is because there is a shortage of natural resources, there are specific laws making companies responsible for the solid waste generated and for the contamination of the environment in general, and there is also concern about the social impacts arising from business activities.

The concept of sustainability is essential for logistical activity, as it has a major environmental impact, either through the generation of pollutant gases that contribute to the greenhouse effect or through the generation of various waste. These factors brought new demands to the environmental management of logistics operators. According to Santos

(2012), in addition to the environmental impacts mentioned, the sector of logistics services companies must take into account the social impacts generated. In this sense, reverse logistics is an important aspect, as it is considered a strong income factor around the world. In this way, studies have included sustainability aspects in the evaluation of logistics activities (DADASHPOUR; BOZORGI-AMIRI, 2020).

Since the 1990s, there has been a growing demand for outsourcing of logistics activities worldwide (SINK; LANGLEY; GIBSON, 1996; ZAMCOPÉ *et al.*, 2010). Thus, the importance of logistics operators, which are companies providing logistical services, is growing in order to perform the activities of one or several actors in the supply chain, using physical and technological infrastructure, means of transport and own or external information systems (BRAZILIAN ASSOCIATION OF LOGISTICAL OPERATORS - ABOL, 2018). This has created a growing pressure for quality logistics services, given that logistics operators have a direct relationship with customers.

With the objective of seeking a competitive differential, Brazilian organizations started to regard logistical activities as strategic. Thus, the evaluation of the performance of the logistics operators as to the quality of the services provided, became essential for the business of the companies (ZAMCOPÉ *et al.*, 2010).

Nguyen, Phan and Matsui (2018) argue that in full quality management, or any other quality management approach, there are common points to be found with sustainable practices. In this sense, models for assessing the quality of services provided by logistics operators, which also include sustainable aspects, have been developed, such as Gupta, Singh and Suri (2018).

Thus, the objective of this work was to analyze aspects of quality and sustainability in Brazilian logistics operators from the perspective of the service contractor, considering the elements of the model proposed by Gupta, Singh and Suri (2018). To do so, a case study was carried out in a large company in the dental and hospital medical equipment sector

This work is justified in the first place by the lack of research addressing the subject in Brazil. Searches made in 2018 on the SciELO, Google Academics and Scopus databases using the descriptors "sustainability and logistics operators", "logistics operators", "sustainability in logistics", "sustainable practices in Brazilian logistics", "logistics operators in Brazil", "sustainable approaches in the logistics sector", did not recover works that specifically address this theme. Secondly, the sector has grown and gained notoriety: it is responsible for an annual income estimated at R \$ 44,3 billion, the generation of 710.084 direct and indirect jobs in the country, and the collection of R \$ 9,2 billion in taxes and labor

charges, (...)" (ABOL, 2015). This increases the demand for knowledge that can contribute to the improvement of the performance in quality and sustainability of these companies.

Theoretical Revision

2.1 Logistical operators

For Gupta, Singh and Suri (2018), the logistics service providers or logistics operators are third-party organizations whose main function is to carry out the logistics activities of companies that believe that outsourcing is beneficial and sustainable. Providers of these services must administer, control and deliver the products of the organizations that have contracted them. By being outsourced, they deliver multiple products to multiple customers at the same time, which often lowers transportation and storage costs by product (TAN *et al.*, 2014).

The logistical activities offered by the logistics operators can be classified in several ways: transport, involving different modes and ancillary services, product storage; product handling (packaging, labeling, *kits*); industrial operations such as final assembly, quality testing, etc.; commercial operations such as order receipt, payments, advertisements; informational services such as stock management, fleet tracking; and engineering consulting and logistics chain administration (ABOL, 2015).

There are several factors that have motivated the outsourcing of logistics activities by companies and the consequent hiring of logistics service providers. These include reducing costs, improving service levels, increasing operational flexibility, and focusing on key business competencies (WILDING; JURIADO 2004; ABOL, 2015).

The strategy of outsourcing the logistical activities has been important for the competitiveness of various productive sectors. In this way, logistics operators have become important agents in supply chains. Assessing the quality level of logistical services delivered by logistics operators is an important factor in reducing business risks. Thus, models for evaluating the quality of the services provided have attracted the attention of professionals and researchers in the area (GUPTA; SINGH; SURI, 2018; DADASHPOUR; BOZORGI-AMIRI, 2020)

2.2 Quality and sustainability of logistics operators: an evaluation model

A growing number of companies are undertaking efforts to achieve corporate sustainability (GRAVRONSKI, 2009; SOUZA; SACOMANO; KIRILLOS, 2017). In this sense, studies have pointed out that quality management practices have contributed to the organizational performance regarding the overall sustainability of companies. This is because with the improvement of quality, mainly processes, there is a decrease of defects and consequently reduction of waste and waste of resources used as raw materials and energy (GUPTA, 2017; NGUYEN; PHAN; MATSUI, 2018). This relationship strengthened as the National Quality Awards began to incorporate sustainability aspects into their evaluation criteria. In the case of Brazil, sustainable development is one of the eight foundations of the National Quality Foundation (FNQ) Model of Excellence in Management (MEG).

Gupta, Singh and Suri (2018) propose a *framework* for assessing the quality of logistics service providers, in the context of a developing country, which includes sustainability aspects (Figure 1):



Figure 1- Proposal for sustainable quality of service management by logistics operators

Source: Gupta, Singh and Suri (2018)

Gupta, Singh and Suri (2018) considered:

- Assets: fleet, warehouse, information technology, skilled and experienced workforce and network of relationships.
- Processes: order processing, storage management, resource optimization, sustainable practices, multimodal transport.
- Quality of the services delivered: it is analyzed from some aspects such as commitment, competence, communication, creativity and personalization, cost optimization, coordination and collaboration and culture
- Performance: It is analyzed by performance parameters such as increase in business volume, improvement in quality, increase in shipments, optimization of the green logistics network and use of recyclable or reusable packaging.

In this way, Gupta, Singh and Suri (2018) propose a holistic approach, considering various aspects such as the different assets, processes, quality index and the performance of the logistics operator.

Methodology

The case study was the research strategy used in this work. The choice for the case study was: a) because it is a contemporary phenomenon over which the researcher has no control over the variables involved; b) because of the need to obtain information from various sources of evidence so that it is possible to describe this phenomenon in a broad and profound way; c) because of the need to use various research instruments (YIN, 2015). The Yin protocol (2015) was used to conduct the case study. The case study took place at a large company, located in the interior of São Paulo in Brazil, which outsources its logistical activities to various logistics operators. For the purpose of this work, the five main logistics operators providing service to the company were considered. The research instruments used were the structured interview, and the questionnaire closed. This was done to limit the volume of information, enable comparison with the same set of questions and obtain a greater focus on the theme (LAKATOS; MARCONI, 2003).

The interviews were conducted with managers and employees from the *Supply Chain* area, being one of purchasing, two from the logistics sector and two from the expedition and one from the fiscal sector. In addition, a questionnaire was applied to assess issues related to sustainability and quality in the service offered. In total, six interviews were conducted. The questionnaires were applied to the same six interviewees.

From the Gupta, Singh and Suri model (2018), the variables considered were:

- Assets: presence of own warehouses and fleets, use of GPS and other advanced technologies, carrying out employee training, order management tools, traceability and green and sustainable logistics practices. The data were collected by means of an interview;
- Processes: We sought to verify how order processing, services offered, and storage management works. Data collected through interviews;
- Quality of service: Seven aspects were considered: commitment, competence, communication, creativity and personalization, cost optimization, coordination and collaboration and culture. The data was collected by means of a questionnaire, each aspect being evaluated by the company by means of a *Likert* scale of 1 to 5, being 1

very low and 5 very high. Employees responded 1-5 based on their perceptions of the presence or absence of such aspects in the services offered by the logistics operator.

This work was limited to the Active, Process and Quality of Service components of the *framework* of Gupta, Singh and Suri (2018).

3.1 Case Study

The company in question is active in the health sector. It produces and sells dental medical equipment, and handles about 350 million reais a year. It is a sales leader in Latin America and exports to more than 150 countries. The company spends about 9 million reais a month on domestic and international purchases of raw materials and parts such as steel sheets, tools, plastic materials, electronic parts, bearings etc., which generates a huge amount of requisitions for purchases every day. In some cases, the supplier of the material is responsible for the freight to the company and, in other situations, the company is responsible for the logistics of the material. Regardless of the agreement signed with the supplier, the company requests that all transportation, if the supplier does not have its own fleet, be done by one of its logistical partners.

Table 1 shows the characteristics of each of the five logistics operators considered in this work.

Logistic operator	Feature
Operator A	Intended for inland transport of dedicated cargo and split parcels on the internal market. It is ISO 9001 certified.
Operator B	Multinational. It acts primarily in the international express referral of correspondence, documents and objects. Is ISO 9000 certified
Operator C	International logistics with sea and air options. Maintains a global framework for action through a partner. It has teams dedicated to each customer's segment in order to provide a customized and quality service. It is ISO 9001 certified.
Operator D	Specializing in transportation of medicines and aesthetic products, it has become one of the largest in Brazil for this specific sector. It has 17 branches concentrated mainly in the South and Southeast regions of Brazil.
Operator E	It is focused on cargo transport, fractionated and dedicated, industrial, pharmochemical and waste. In addition to acting strongly on storage. It has ISO 9001.

Table 1 - Characteristics of logistics operators.

Results and Discussions

The results and discussions will be presented following the elements of the model proposed by Gupta, Singh and Suri (2018).

4.1 Asset valuation

Table 2 shows the characteristics of the five logistics operators for the assets. Logistic operators generally have their own warehouses available to their customers. Logistic Operator C, being an international freighter, has no warehouses in Brazil, but partners with other logistics operators if the customer needs such a service. Four of the five operators analyzed have their own fleet. Logistic Operator C has its entire fleet outsourced.

All logistics operators, in the company's perception, have a fleet with GPS. Managing company orders is a requirement when it comes to hiring a logistics operator, so all operators have a system that allows you to generate reports with order quantity, item description, order source and destination, time when the load remained in the operator, etc.

"Advanced technology" refers to the use of warehouse automation and material handling systems. These are, according to Gupta, Singh and Suri (2018), an important aspect to be considered when hiring logistics operators. However, only operators B, C, and D have current and innovative high-tech management systems such as semi-automated and automated material handling systems.

Online *tracking* of cargo is a requirement for hiring logistics operators (GUPTA; SINGH; SURI, 2018) as it is important for the company to inform its end consumers and even for the factory itself, which often needs to schedule production from the arrival of certain raw material. In the perception of the interviewees, with the exception of Logistic Operator E, which informs the position of the request only when contacted via e-mail or telephone, which diminishes the agility of the information, the other operators have an area on their *sites* intended for customers to track the requests.

Qualified collaborators are an important asset, according to Gupta, Singh and Suri (2018). In the perception of the interviewees, all logistics operators have well-trained employees. This perception is justified by the good service, help with loading and unloading and mainly proximity to the customer, reported by the interviewees. Operator D has been cited as the best performer in this asset, because in addition to training its employees for operational issues such as economic and safe driving of their vehicles, it also offers risk management trainings. This result goes in the direction of the result obtained by Gupta, Singh and Suri (2018).

Dimension	Op. A	Op B	Op. C	Op. D	Op. AND
Own Warehouse	✓	✓		✓	✓
Own Fleet	✓	✓		✓	✓
GPS fleet	✓	✓	✓	✓	✓
Request Management Tools	✓	✓	✓	✓	✓
Advanced Technology		✓	✓	✓	
Online load tracking	✓	✓	✓	✓	
Employee Training		✓	✓	✓	✓

Table 2- Characteristics of logistics operators for assets.

4.2 Assessment of management processes

The processing of requests from the logistics operators of the analyzed company is quite symmetrical and is practically the same in all of them (Table 3). The service requester contacts the logistic operator by providing the weight, size, quantity, etc. information of the cargo, via e-mail or telephone. The differential occurs on the part of Operators A and D: Operator A makes it possible to obtain quotes previously by its *website*; Operator D allows the issue of invoices by its *website*.

Dimension	Operator A	Operator B	Operator C	Operator D	Operator E
Order Processing	Phone, email, website	Quote with time, site or phone rate calculation	Automated response and control system	Quote by phone and invoice by website	Telephone quotation and tracking system
Storage Management				WMS to manage storage activities and distribution centers	Integrated system service from receipt to material separation
Key Services Offered	Road transport and storage	Road and air transport, storage	Air, maritime and road transport	Road, air and logistical transport (storage, loading and unloading)	Air and road transport, waste storage and disposal
Other value-adding services	Multiple load options	Custom packing, label printing, online invoices	International insurance	Specialist in pharmaceutical logistics	Waste solution and option to deliver and collect in small times
Resource Optimization	Integrated tracking and monitoring system	Customs clearance, reporting, different packages	Investing in technologies to make process automated	Risk management, personalized managers	Strategic locations and speed

Sustainable practices		Selective garbage collection	Selective garbage collection	Selective garbage collection Awareness of waste removal and disposal	Selective garbage collection Reverse logistics
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Table 3 - management processes

As for storage management, only Operators D and E, who ship the ready products, often to other countries, have an integrated management system from the receipt of the load and stock management to the separation and distribution of the product. According to the interviewees, the use of this type of system is one of the requirements imposed by the company (Table 3).

As for multimodal transport, only Operator A does not offer it, however, it only carries supplies in regions close to the company's location. Logistic Operators B, C, D and R offer road and air modal. Operator C, on the other hand, offers road, air and maritime modal (Table 3).

The services that add value to logistics operators are quite varied, and depend heavily on the focus of each service provider (Table 3). For example, Logistic Operator A, having a large part of its assets and processes focused on road transport, offers several load options, which is very interesting for the company studied, since it has need of fractional load transport. On the other hand, Operator C, which is responsible for assisting in the importation of materials, offers international insurance.

Sustainable practices have been important aspects to be considered when contracting logistics operators (GUPTA; SIGNH; SURI, 2018; MAGETO, 2022). As for sustainable practices, only selective garbage collection and the targeting of such collection to recycling companies were observed in four of the five operators. According to the interviewees, Operator A never showed interest or made mention of developing sustainable practices. On the other hand, Operators B, C, D and E declare who carry out the selective collection of waste and waste and its targeting to recycling companies. Operator D, for having in its scope of services solutions for waste, has as sustainable practice the awareness of the need for safe removal and disposal of waste. Operator E performs reverse logistics in addition to selective garbage collection. In other words, these practices are still incipient in the logistics operators considered in this work. This contrasts with the result of research by Gupta, Signh and Suri (2018), which reports on various other practices such as storing rainwater for the use of recycled water, mainly for washing their fleet, using photovoltaic panels and planting 5000 trees per year as compensatory action. With regard to IT, operators make use of GPS in their

trucks, which helps reduce fuel consumption and carbon emission, however, the use of green information technologies (*Green IT*), for the reduction of environmental impacts generated by document printing (PENHA, PASCHOALIN FILHO; FARIA, 2018), was not verified in the case studied.

As for resource optimization, each of the five logistics operators studied has a different way of optimizing their resources, one with integrated systems and managers 100% dedicated to the demands of each company, others with locations of their branches strategically in airports and ports (Table 3).

4.3 Quality of Service and Performance Index.

Consumer feedback is one of the mechanisms for assessing the quality of service provided (FITZSIMMONS; FITZSIMMONS, 2014). Table 1 presents the results of the quality performance evaluation for each logistics operator carried out by the six interviewees.

Dimension	Op. A	Op. B	Op. C	Op. D	Op. A N D	Medium
Commitment	4.0	4.0	4.5	4.5	4.5	4.3
Competence	4.0	4.0	4.5	4.0	4.5	4.2
Communication	3.5	4.5	5.0	4.5	4.5	4.4
Creativity and customization	3.5	3.5	4.5	4.0	4.0	3.9
Cost Optimization	4.0	3.5	4.0	3.0	4.5	3.8
Coordination and collaboration	4.5	3.5	4.5	5.0	4.5	4.4
Culture	4.5	4.0	5.0	4.5	4.5	4.5

Table 1 - Average for quality and performance evaluation

To calculate the quality and performance index Gupta, Signh and Suri (2018) were based on the Cleveland; Schroeder; Anderson (1989) model, developed to evaluate production competence. Thus, the quality and performance index is given by:

$$SQI_i = \sum(W_j \cdot Log \cdot M_j) \quad (1) (2)$$

Where: SQI_i represents the value of the quality of service and performance index i ; W_j represents the weights given for each of the attributes; R represents the ranking of the attributes; M_j is the inverse of the ranking.

To assign weights, the first step was to match the Likert Scale from 5 to 1 to 100% to 0%, respectively. Then, the W_j weights were assigned for each of the dimensions considering: mean > 3 , weight 1 (strong), for percentage $>60\%$; average between 2 and 3, weight 0 (neutral), for percentage between 40% and 60%; average < 2 , weight -1(weak), for percentage $< 40\%$ (GUPTA; SIGNH; SURI, 2018).

The SQLi results for the five logistic operators are in table 2. As all five operators obtained average scores above 3.5 for the dimensions considered, with the exception of a note 3 in the cost dimension for Operator D, the calculated indices are very close. This was because the average scores given to the operators were very close and therefore the weights were equal, with the exception of the weight for the cost dimension for Operator D. Thus, the results point out that, for the company studied, the five logistic operators considered in this work have the SQLi nearby, and Operators C and D have the highest indices (3,7), followed by Operators A and E (3,5). Operator A obtained the lowest score (3,3).

The use of SQLi also enables the performance analysis of each logistic operator in the dimensions considered: Operators A had its best performance in coordination and collaboration, however, needs to undertake efforts to improve creativity and personalization, commitment and communication. On the other hand, Operator C performed better in communication, however, a *gap* of performance *can be noted* in the coordination and collaboration dimensions and cost optimization. In general, it is observed that the dimensions cost optimization and creativity and customization are those that obtained the lowest SQLi for three of the five logistic operators considered in this work. This result suggests that there is room for improvement in these aspects.

Dimensions	Notes					Ranking (R)					Inverse of R (Mj)					Reverse R Log (Log Mj)					Weight (Wj)					Wj.Mj Log									
	A	B	C	D	AND	A	B	C	D	AND	A	B	C	D	AND	A	B	C	D	AND	A	B	C	D	AND	A	B	C	D	AND					
Logistic Operator	A	B	C	D	AND	A	B	C	D	AND	A	B	C	D	AND	A	B	C	D	AND	A	B	C	D	AND	A	B	C	D	AND	A	B	C	D	AND
Commitment	4.	4.	4.5	4.5	4.5	3.	3.	3.	4.	1.	5	3.	5	4.	7	0.3	0.5	0.7	0.6	0.9	1.	1.	1.	1.	1.	0.3	0.5	0.7	0.6	0.9					
Competence	4.	4.	4.5	4.	4.5	4.	2.	4.	5	2.	4.	6	4.	3.	6	0.6	0.8	0.6	0.5	0.8	1.	1.	1.	1.	1.	0.6	0.8	0.6	0.5	0.8					
Communication	3.5	4.5	5	4.5	4.5	6	1.	1.	3.	3.	2.	7	7	5	3.	0.3	0.9	0.9	0.7	0.5	1.	1.	1.	1.	1.	0.3	0.9	0.9	0.7	0.5					
Creativity and Embodiment	3.5	3.5	4.5	4.	4.	7	5	5	6	7	1.	3.	3.	2.	1.	0.0	0.5	0.5	0.3	0.0	1.	1.	1.	1.	1.	0.0	0.5	0.5	0.3	0.0					
Cost Optimization	4.	3.5	4.	3.	4.5	5	6	7	7	4.	3.	2.	1.	1.	4.	0.5	0.3	0.0	0.0	0.6	1.	1.	1.	0	1.	0.5	0.3	0.0	0.0	0.6					
Coordination and collaboration	4.5	3.5	4.5	5	4.5	2.	7	6	1.	5	6	1.	2.	7	3.	0.8	0.0	0.3	0.9	0.5	1.	1.	1.	1.	1.	0.8	0.0	0.3	0.9	0.5					
Culture	4.5	4.	5	4.5	4.5	1.	4.	2.	2.	6	7	4.	6	6	2.	0.9	0.6	0.8	0.8	0.3	1.	1.	1.	1.	1.	0.9	0.6	0.8	0.8	0.3					
SQLi=																					3.3	3.5	3.7	3.7	3.5										

Table 2 - SQLi Quality and Performance Index Calculation

1 Reliability and accountability with deadlines

2 Logistics provider's infrastructure, skilled workforce, capacity and network coverage

3 Marketing strategy and communication with the market

4 Have flexibility to meet customer demands

5 Cost optimization such as asset sharing with other customers

6 Supply chain integration and information sharing via IT use

7 Attitude and courtesy to the customer

Note: These dimensions were listed by Gupta, Singh and Suri (2018) for the calculation of SQLi based on extensive bibliography on the quality parameters relevant to logistics operators

Conclusion

The objective of this work was to analyze aspects of quality and sustainability in Brazilian logistics operators from the perspective of the contractor of the service. To do so, a case study was carried out in a large Brazilian company, analyzing its five main logistics service providers. The assets, processes, quality performance and performance of the logistics operators were analyzed from the perspective of the contracting company. The main findings of this study were:

- Logistic operators are looking to use advanced technologies, particularly with regard to the traceability of their assets and customers' goods, with the aim of providing greater security. They have also invested in the automation of their operations, in order to optimize time and cost;
- Adherence to sustainable practices is still incipient in the five logistics operators studied. One hypothesis is that these practices are still not being valued by companies when hiring logistics service providers in Brazil. This is therefore an issue to be investigated in future research;
- Operators are concerned with providing a skilled workforce by providing training;
- All logistic operators, in a complementary way, provide a wide variety of aggregate services, covering transportation, storage, loading/unloading and international insurance, seeking to meet the demands of the contracting company;
- The contracting company has a perception of quality and high performance value delivery from the contracted logistics operators. However, it must be stressed that there is room for improvement, especially regarding communication, cost optimization and creativity and personalization.

Given the nature of the method used, a case study, the results of that study cannot be generalized. However, they bring researchers and logistics professionals an approach to improve assessment procedures for logistics service providers. In this sense, two aspects should be highlighted: first, the inclusion of sustainability dimensions for the evaluation of the quality of the services provided; second, the SQLi analysis, which can point out the *gap* in performance and thus prioritize actions for the improvement of quality.

It is recommended that more studies be carried out, broadening the base of companies investigated with their respective logistics service providers, as well as analyzing the evolution of their performance over time. In addition, it is also suggested to include

other sustainability aspects, not only in their environmental but also in the social dimension, such as those listed by the *Global Reporting Initiative* (GRI), and to include other quality parameters.

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