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LOSSES IN ROAD CARGO TRANSPORTATION: A CASE STUDY

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ABSTRACT: The logistics area with the largest representation is the road modal, and cargo transport operations by this modal are prone to losses in their processes, causing setbacks in the agility of movements, customer reliability, increased costs, reduced profits, among others. The optimization of operational processes is a constant in organizations. The research is a case study with a qualitative, exploratory approach, whose objective was to understand the losses in road cargo transportation, in the light of the conceptual theory of the Toyota Production System. The results of the study pointed to the clear rupture in the communication between headquarters and branches, the management of processes in an efficient and effective way between units, and the losses due to breakdowns, misjudgments, and misplacement of goods.

Keywords: Transportation losses. Logistics. Processes. Toyota Production System.

INTRODUCTION

In globalized markets, where there are no borders, any product is manufactured and sold anywhere in the world. In view of the competitiveness of brands, products, variety and service, there comes a whole decision of logistical processes, such as, for example, the reduction of stocks, flexibility of production and purchase lots, transport, among others, that need special attention.

Market strategies generate well-planned businesses, optimizing operational costs, production time, practicality, and product quality. All these decisions are reflected in the way and when the products are transported, especially by the Trucking Companies (TRC).

Among the five logistics modes that are used to transport goods, in Brazil the road channel is the most used, with 75.9% of all goods shipped (FUNDAÇÃO DOM CABRAL, 2017). The importance of this means of transportation is evidenced by its advantages, such as: greater flexibility of routes, greater accessibility to the destination of the goods and the possibility of door-to-door transportation (CNT, 2019).

Besides the relevance that the TRC sector has for companies, there is also the strong impact on Brazil's economy. This was clear in May and June 2018, when truck drivers decided to strike against Petrobras' pricing policies. In this period of the year, the commerce was marked by empty shelves in supermarkets, in addition to lack of fuel in gas stations (IG, 2018).

As in any economic sector, the road cargo transportation may cause losses in its processes, which may lead to a reduction in competitiveness and/or in the effectiveness of the carriers. This fact led to a theoretical discussion focused on losses, according to Shingo, who states in his work (2007, p. 110), "Loss is any activity that does not contribute to operations, such as waiting, accumulation of semi-processed parts, reloading, passing materials from hand to hand, etc." These factors influence the final costs of organizations, consequently their profits. For Ohno (1997), profitability can only be obtained by reducing costs. For this reason, it is important to look for, understand, and deal with losses. Losses are classified into seven groups: losses due to overproduction, transportation, processing itself, manufacturing of defective products, handling, waiting, and inventory (Shingo, 1996).

Although important research are constantly being presented about costs in transportation, one realizes that there is a gap to be explored regarding the understanding of bringing to light the theories, the logistics processes of transportation, under the optics of the various possibilities of losses. And it is in this context that this study aims to analyze the processes and identify possible losses in road cargo transportation, following the management

model of the Toyota Production System (STP). This tool, even though it has its great development in the vehicle industrial branch, it is widely applicable in the most diverse types of markets, as supported by Moreno (2018). In this understanding, Araújo et al. (2018) used the concept of STP losses in the production of craft beer; Correia (2018) applied the lean philosophy in civil construction; Polancich et al. (2019) used the tool in a neurosurgery operating room; Ziegler et al. (2020) conducted a case study on identifying losses in an apiary, confirming that the thoughts of STP are comprehensive to various niches.

Given the contextualized understanding about the Toyota Production System waste, the article is guided by the following question: What are the losses that are present in the context of road cargo transport?

The present work is subdivided into (i) Abstract, which presents the main ideas; (ii) Introduction, where the scenario in which the work was developed is discussed; (iii) Theoretical foundation, which brings theoretical background about the Toyota Production System, the Road Transport System and the Road Cargo System; (iv) Methodological Procedures, at this point the focus of the study is presented, and also how the necessary data was acquired; (v) Analysis and Discussion of Results, point where the focus is on the results obtained, and also performed an analysis of such results in comparison to the literature presented; and (vi) Conclusion, the result of the work as a whole is presented, besides being listed the limitations found during the development.

THEORETICAL FOUNDATION

Toyota Production System

According to Ohno (1997), the Toyota Production System arose from the need to meet the production of small batches of a wide variety of products, a demand that came post-war, arising from competing with the American large-scale production. To achieve the objectives, the Toyota Motors Company worked on eliminating losses and waste.

This system has gained ground in the academic and industrial worlds worldwide, much due to the impact of Just-In-Time on prevailing production management methods (SHINGO, 1996).

STP completely eliminates unnecessary elements in production, reducing costs, increasing capital turnover, and ultimately increasing the productivity of a company as a whole. (Paris, 2016.)

L*osses according to the Toyota Production System*

Antunes et al. (2008), conceptualizes that losses are procedures or movements that are dispensable or that do not add value to the final product, thus they must be eliminated within the operations.

The following points are important in understanding the concept of losses (Ohno, 1997): (i) cost reduction will bring greater efficiency, i.e. one should only produce what is necessary with as little labor as possible; (ii) efficiency must be analyzed and improved in each production process, but also for production as a whole.

Shingo (1996) defines losses as:

- Overproduction losses: This group of losses is divided into two types, quantitative, which is when the company produces more than necessary, and anticipated, when the company produces earlier than necessary.
- Transport losses: The displacement or transportation of products and materials, which is an expense that does not add value to the product. Many companies use tools and mechanisms to reduce transport, when in fact they should make adjustments to eliminate them, such as changing the layout of the company.
- Losses by processing itself: unnecessary tasks for the production process of the good or service. Incorrect and inappropriate use of tools or procedures, dispensable processes performed, steps and services that can be eliminated without affecting the characteristics and functions of the final product.
- Loss due to manufacturing of defective products: This is the loss related to lack of quality, where components are produced below specifications, or when the product does not meet the established requirements. Characteristics of production processes with specification or established standard problems, problems with raw materials or labor, which lead to defects in the use of the final product, directly affect the product or service.
- Loss by movement: These are excusable movements that workers exert, such as losses, reloads, hand-to-hand transportation, etc. Unnecessary movements in operations, within the product production process, that can be eliminated without affecting the characteristics and use of the final product, optimizing time and manpower.
- Loss by waiting and stock: The losses by stocks are the processed products that are stored waiting to be output, and the more processed the product is, the more cost it will have to stay stagnant in stock, for a long time it was considered a necessary evil, but over time it became

clear that it was a great waste, from there that Just-in-time started. As for the waiting loss, it is characterized by idleness of one or more stages of production motivated by waiting for the supply of products, inputs or labor.

Road Transport System

The road transport system is basically divided into collective road transport and freight road transport, where there is commonly the use of road vehicles for collective transport, carrying loads in a mixed form, even in small quantities.

Road is the segment with the largest share in the cargo transport matrix (61%) and the main mode of travel for passengers, regardless of distance, being the largest employers in the non-financial services sector, in 2016, 14.1% of workers in this sector were engaged in activities related to road transport of cargo and collective (NATIONAL TRANSPORT CONFEDERATION, 2017).

Collective Road Transportation

According to Law No. 12,587 of January 3, 2012 (Brazil, 2012), transportation can be classified as either freight or passenger, and also as collective or individual, ranging from public to private.

Public collective transportation is defined as a passenger transportation service available to the entire population for a fee, with values set by the government. The collective private transportation is outlined as passenger transportation activity not open to the public for travel practice with particular aspects for each line and requirement (Brazil, 2012).

Freight Highway Transportation

It is the one that makes use of roads, highways, and streets, paved or not. It transports animals, goods, raw materials, products, people, among others.

Road transport in the country plays a major role, considering the lack of attention given to other modalities, not to mention its agility, which enables many alternative routes, and the efficiency of reaching certain places that other means do not reach. Road transport corresponds to approximately 60% of the total cargo handled (VALENTE; PASSAGLIA & NOVAES, 2003). Its importance can be measured by three indicators: costs, revenue and profit, being 60% of the logistics costs, 3.5% of the revenue, and in some cases, more than double the profit (FLEURY, 1999).

It is important to emphasize the different possibilities of cargo transportation vehicles, due to the variability of products, such as liquid, bulk, gaseous, flammable, and various products in fractional loads.

Among the aforementioned types of cargo, the road transport of fractional loads, used in case there is a need for diligent deliveries, due to customer demands or inventory reduction, as well as by spreading the destination points in the national territory, or for cost issues (Ferreira, 2018).

The law 11.442/2007 (Brazil, 2007) provides for the Highway Transportation of Cargo, allows the fractional load that, for its operation, requires from the service provider a functional structure including people, cargo sorting terminal and equipment (trucks) for collection and delivery (Oliveira, 2007).

The operational stages of this transport process are: collection, transference and delivery. Still according to Oliveira (2007) the companies that operate fractional loads must keep up with the following movements in the market:

a) the hubs, the areas with less structure that have a great need for transportation services.
b) pillars of transportation services, transportation companies generate information when changes occur in transportation operations.
c) segment and operational profitability, where the freight carrier needs to define in which segments it will operate.
d) modality and freight pricing, the relationship of the carrier will be with the entity responsible for the payment of the freight.

The cargo transportation segment registered, in the first quarter of 2021, an employment generation of 33,964 jobs with a growth of 3.6% in the volume of services, while the Brazilian economy grew 1.2% in the period, following the growth trend observed in the last years. (CNT, 2021).

The volume transported by road cargo transportation corresponds to six kilograms for every ten kilograms of cargo distributed in Brazil, where the system as a whole involves the participation of 157 thousand cargo transportation companies, 555 thousand autonomous and 350 cooperatives (ANTT, 2021).

METHODOLOGICAL PROCEDURES

The selection of the company for this study was based on defined criteria that would allow the development of a research subsidized by information that has conditions for a deep and robust analysis and that can guarantee the validity of the research. The determining factors in the choice of the company under study were: The *know-how* in the active market; the diversity of business segments served; territorial coverage; the varied logistics services provided; availability of information at the strategic, tactical and operational levels. The company has 630 employees and 400 heavy, medium and light vehicles, 90% of which are its own and the rest are outsourced, distributed in seven units, strategically located in the states of Rio Grande do Sul, Santa Catarina, Paraná, São Paulo, Rio de Janeiro, and Minas Gerais. The seven units serve 121 cities in the six states where it operates.

The research is framed as a case study, Canceled by Yin, R.K. (2015), being an applied research, with qualitative approach and exploratory objective, as a technical procedure a case study, justified by the need to investigate a social phenomenon that involves organizational and administrative processes and real life events, (Flick, 2013), aiming to improve ideas or discover intuitions, as well as to provide greater familiarity with the problem to make it explicit or to build hypotheses (BARROS, 2000; Köche, 2011).

For the data collection stage of this research, it was opted to use the interview technique because it is one of the most important sources of information for a case study and because it is a flexible instrument of collection, in which the interviewee has the freedom to expose his or her understanding of the questions directed to him or her, allowing the enrichment of the details of the information. The interviews were conducted by means of semi-structured scripts, with ten employees who work at the strategic and tactical levels of the company, who work in different departments and are in constant interaction with each other, with the operational areas, and with the strategic business units. The data collection had its outcome during the months of July and August 2019. As an initial process, the interviews were scheduled through electronic messages, so that, after confirmation, the statements were taken.

The interviews followed a semi-structured script, in a single session, in a reserved place. Before the beginning of the interviews, the interviewees were informed about the research objectives, the confidentiality condition, and the condition that the interviewee could interrupt, terminate, or refuse to participate in the research at any time, being available to answer any questions during the interview process.

All the interviews were stored in a Sony digital voice recorder, model ICD-PX240, totaling 295 minutes of audio recording, and later the information was transcribed into 41 pages. Finally, the transcriptions were, in their entirety, entered into NVivo 10 *software.*

The categories of analysis identified through the suggestions of the results presented by NVivo®10 were structured into three variables that stood out from the others and were supported by the *software to* align the macro categories.

The professionals participating in the research, all allocated in the company's headquarters, according to their positions, as described: President, Operational Director, Commercial Director, Administrative Director, Financial Director, Administrative Manager, Human Resources Manager, Logistics Manager, Unit Manager, and the Fleet Maintenance Manager.

ANALYSIS AND DISCUSSION OF RESULTS

Analyzing the managerial processes

The results of the interviews at the company under study, backed up by the literature, demonstrated an alignment of the management processes in an eloquent manner with those proposed to its employees.

Thus, the next subsections demonstrate the processes evidenced by two or more employees. These processes were grouped by reports for analysis according to the interviewees' statements.

Management of the handling processes and transportation

The dedication to handling management and product transportation, was forcefully mentioned in regards to the concern in maintaining a tight and effective control, based on the fundamental processes of the company's operations, which are handling and transportation, by means of reports generated daily and that provide comparisons in the daily, weekly, and/or monthly evolution.

"We are very cost-based. In the past we didn't have this constant concern, but today it is paramount. Because our command is the cashier. So it has become almost vitally important. In many moments, we look more at costs than at revenues. We are not managing to assess positive results" (interviewee - company president)

The objective of this centralization of the main costs is due to the significant amount of the company's revenues and the need for immediate decision making, avoiding compromising the cash flow and enabling profitability and competitiveness.

"The most important thing today is the cost management report. It has to be very detailed, so that we can follow up on a daily basis what happened. So you know how much he spent on diesel, how much he spent on maintenance, each item" (interviewee - company president).

The items considered to be the main cost drivers for the company are fuel, tires and labor. Around 85% of these are controlled directly by the company's top management. The other costs have their controls duly distributed by the managers of each area and/or department.

Maintenance and acquisition management:

The purchasing sector and the maintenance sector are separate, but they go together because they need a very strong integration, once the need and specificity of parts and/or products to be purchased comes from maintenance. At this moment, the synergy between sectors is fundamental, aiming at cost reduction.

Although the maintenance is done in the company, with its own structure and workforce, some situations generate considerable costs in vehicle maintenance. This occurs when mechanical problems occur during the trip, which leads to expenses beyond what was foreseen, since it is difficult to buy parts when the vehicle is in transit and there is the possibility of becoming hostage to the abusive market.

"Today the purchasing and maintenance sector is one of the main sectors in terms of company costs. Because today we have variable costs, which are the purchase of fuel, which is a very significant amount in the company, the purchase of tires, spare parts, lubricants, inputs and all the materials that you will need to make a transport" (interviewee - company president).

Preventive maintenance is customary, however, due to adverse road conditions and/or bad weather, there may be a need for unpredictable repairs and/or replacement of parts.

"Vehicle maintenance is expensive, for example, an engine overhaul can reach 20% of the vehicle's value. See that this example justifies the requirement for the buyer to know exactly what he is buying and maintenance has to inform the buyer precisely of his needs" (interviewee - company president).

Some factors contribute to hindering maintenance procedures during the trip. For security reasons, tr provides as little cash as possible for trips, which, in case of problems with

the vehicle, makes it impossible to pay for services and parts. For payments by invoice, there are conditions imposed by the service providers, which are registration, credit analysis, and, generally, payment terms of, at most, five days.

Although the carrier has been in the market for decades and has irreparable financial credibility, there are still cases in which suppliers or service providers refuse to supply parts or labor on term payment terms, under the pretext that default is constant and compromising their business.

Finally, the sophistication of the vehicles requires qualified professionals, up-to-date and with modern equipment for repairs. However, in many cases, mechanics do not have enough knowledge or even computerized systems to make the necessary repairs or adjustments.

Meeting delivery deadlines

In transportation, the condition of meeting pre-established deadlines is a determining factor, given that organizations tend to work with a minimum of inventory. The clientele served by the transporters keep to this management concept, that is, the shortest deadlines possible in meeting their deliveries and/or receiving products, operationalized by the transporters. In the interviewees' reports, it is noticeable the preponderant caution against customer dissatisfaction and the possibility of losing them to competitors.

"We try to excel in agility. In the business we are in, it has to be like this. It has to be dynamic, it has to be agile. You have to deliver, if possible, even before the deadline, so that we can demonstrate a difference to our customers" (interviewee - operational director).

Meeting delivery deadlines is a recommended practice among the departments, which was evident in five of the ten managers interviewed, i.e., the carrier's strategic and tactical management levels aligned strongly on this elementary point in the organization's activity.

"In our business, the most important thing is meeting the deadline for delivery of the goods, as agreed. This is the crucial point for the success of the business" (interviewee - commercial director).

The monitoring of information and the procedures of the professionals in the collection and transportation operations is constant. It is understood as fundamental, this control, to achieve the purpose of excellence in operational service to customers. In the narrative of the interviewee logistics manager, we can identify the concern in doing something more than what was agreed, proposed, or contracted. The perspective is to deliver the unexpected, that which can be understood by the customer as a benefit.

"It is not interesting to pass on a range of information at the beginning of the collection and delivery process. It can get lost or modified. The ideal is to be correcting and adding information so that, at the end of the task or the objective of delivery, the customer has an excellent level of satisfaction. We have to surprise the customer with attitudes beyond just fulfilling the contracted task" (interviewee - Logistics Manager).

The human factor is directly related to the final result of the operation, the search for customer satisfaction with the services provided. Even with the training provided by the transporter, there are occasional cases of difficulties in relation to the operation of the services, given that it is the loading, unloading and transport professionals who are in constant physical presence with the end customer. It is these professionals who represent the company's image, the first impact of a possible preconception about the company.

"The qualification of the personnel has a direct impact on the main point, which is customer service. Many times, this resource can affect the performance of collection delivery and, consequently, its image with the customer" (interviewee - unit manager).

Some external variables are complicating factors to attend the increasingly specific requirements of customers regarding on-time pickups and deliveries. No matter how programmed the margins of external interference are, some variables are not plausible of total control, such as, for example, the adversities of the traffic, the weather issues, and the demand for compliance with the drivers' working hours.

"The customer wants everything received or delivered on the day agreed upon. And for this to happen, the company's schedules don't always occur as we expected, for various reasons beyond our control. Among others, one of them is the need for the driver to make the trip within the hours defined by law" (interviewee - administrative director).

Carrier managers are convinced that failures in the delivery time go far beyond generating rework, increasing costs and wasting time. From the moment a certain customer requests a pickup and can't pick up at that time, the material will automatically arrive later at the company, which will probably lead to extra hours for employees, which automatically generates higher costs.

Maintenance of the quality of services

The element widely disseminated by the carrier is alignment with market competitiveness. The availability of its services to meet the need to put its customers' products

within reach of end consumers has become paramount. The concern with the carrier's delivery times has become the main focus.

"The most important thing for success is to meet the agreed upon delivery time. This is the most important item in the business. Even though we understand that customer loyalty is very complex, I understand that a satisfied customer is a customer who is very likely to hire our services again" (interviewee - commercial director).

To align the commercial area with the other procedures of the services provided, we work with performance evaluation. As required by the transportation company and the customers, the performance indicators for the fulfillment of the delivery time of the goods are made available. When a certain deadline is not being met for customer service, a contingency action plan is initiated.

The concern with the customer is not restricted only to the delivery time of the goods, which is noticeable in the alignment between some departments, especially between commercial and operations. The level of customer service is a constant concern among the departments, in the most varied activities, such as: delivery, service effectiveness time, assertiveness in documents and collections.

"Since we work directly with the customer, I would say, the question of customer service, in terms of deadlines and quality of service, these are the main factors. Meeting deadlines, because we are talking about delivery to the end customer. Delivery time and customer service itself in their demands" (interviewee - unit manager).

The focus on deadlines does not eliminate the concern with the quality of the services provided. The concern with the preparation and qualification of the employees in the operations area was clear, once it is understood that they are handling the customers' assets, which, in many cases, are products with considerable added value.

In our line of work, what I consider very important is the care with the client's material and the delivery time. Because we always try to pass on to our team that the client is the one who is paying our salary. So we get used to meeting the team once a week. We demand from them not only this part, but also the agility to answer each request as soon as possible, regardless of the volume, the value of the service provided, or the apparent potential of the client. Because I understand, if I were a client and someone was transporting my material, I would also want them to be as quick and careful as possible. So I consider it to be one of the most important, delivery on time and care with the customer's material (interviewee - operational director).

I believe that the relationship with the customer is fundamental for us to have reliability and loyalty. Although the financial area has greater contact with the banking institutions, the

close relationship with the commercial area is very important, in the search for a firm and clear alignment to all between the commercial and financial areas (interviewee - administrative manager).

Even with the main focus on the financial issue, the administrative financial management of the carrier does not fail to maintain the direction to the final customer, under the aspect of satisfaction, avoiding mishaps with mistakes, since one of the characteristics of transport is its very volatile essence, which favors the condition of errors in collections, which can lead to the loss of a customer very quickly.

Alignment between functional areas in the operationalization of services: The interaction between the company's areas gains reinforcement in the conception and attitudes of its directors and managers. An example of the alignment between sectors was verified between the commercial, administrative and financial areas, and with technological support. In the interviewee's words, the concern with alignment is registered.

"The alignment with the commercial area is very important, because the volume of negotiations, the volume of invoices issued, which gives rise to collections, are very large. We have a very lean team, so it has to be very fast, it has to be very agile. For this speed and assertiveness of procedures, numbers and actions that we will take to be effective, we have the support of the information technology area, it is essential" (interviewee - administrative manager).

The purchasing and maintenance sector of the company is one of the main sectors, when analyzed from the perspective of costs, because here the variable costs are verified, which consume considerable revenues. The purchases of fuel, tires, and inputs represent a significant value for the company. All are necessary materials to perform the transportation.

"Purchasing with maintenance have to go together, they have to be aligned. They can be splitted sectors, but they must be interconnected constantly. The buyer has to know what he is buying and maintenance must inform the buyer that everything that is being purchased is consistent with the needs" (interviewee - fleet maintenance manager).

The integration of the financial and commercial departments demonstrates the commitment to eliminate any possibility of failures or errors in the billing processes. Improper charges have direct repercussions on the credibility of the carrier before its clients and, consequently, on the loss of services.

Investment and qualification of people

The country's growing economy provided the opportunity for constant investment, because there were demands to be met. This led to some difficulties in specific sectors, such as transportation.

The internal processes of the transporter, regarding training and qualification are evidenced by the concern in qualifying the professionals, especially the drivers of heavy vehicles, who drive vehicles for long distances.

"The company's guidelines are always like this, to train the person who is going to hire for any of these areas, we spend at least four to five days training them on how it works, how the policies are, in detail" (interviewee - administrative director).

This procedure is in line with the area of specific transport operations, that is, the qualification of drivers, since, until a few months ago, there was a shortage of registered professionals due to the increase in services and the lack of drivers prepared to operate vehicles with advanced technology. It is verified in the reports of the administrative director, the complexity of the qualification of the employees.

"Until last year it was very difficult to hire truck drivers, because there were none in the market. So we went to the extreme of avoiding acquiring new vehicles. There weren't any. What's the point? If I'm not going to have someone to drive? Isn't that so? Finding personnel who adapt to our policy, to our type of company, is also a difficulty" (interviewee - administrative director).

In the logistics operations of handling and transport, once again, the training of people is highlighted and the company is concerned. Verifying the reports on the part of the logistics manager, the latter endorses the arguments exposed and complements them concerning how necessary it is to maintain focus on the activity developed.

"The important thing is the human element. The key to this whole process is the human element. You have to have a well-trained professional, he has to be focused on the activity he does" (interviewee - logistics manager).

"We try to convey to the employees the different levels of commitment. And with this comes the charge and also the way we teach them, so that they understand how the process has to be done correctly. But it is a matter of constant training. Because it is not something that we can do from today we are going to be committed" (interviewee - operational director).

The constant training provided by the company to the employees who handle and transport products has, among many others, the purpose of awakening to the need for excellence and customer service, based on the commitment to their activities.

Loss analysis

Despite not having been informed about the amounts of damages by the company researched, whether through the movement of goods or transportation, these losses are constant and have been a challenge, since it is notorious the concern of its managers with the slowness in identifying and quantifying the damages. The occurrences are probably due to the lack of parameters and measurement and to the stiffness in the agility and veracity of the facts.

The importance of reducing losses in transportation motivates the development of more accurate controls in the processes, with the main focus on reducing economic losses, which become impactful in the profitability of the company. This is consistent with the results found by Costa, Guilhoto and Burnquist, (2015), who estimated in their studies the benefits that the Brazilian economy could obtain if the levels of these losses in Brazil were reduced to the levels observed in high-income countries. The authors identified that, only in agribusiness, reductions in post-harvest losses would imply an increase of R$ 9.8 billion in the value of agricultural production.

The slowness in ascertaining the facts, by means of identification and quantification of the faulty products or that were misappropriated, generates late improvement actions, since the average time between the occurrence and the identification and ascertainment of the facts is about six months. These circumstances induce inconsistencies in the formation of the final price of the services, once the costs are not identified and inserted in the price formation base by the time lag, which ultimately is probably compromising the profitability of the company.

In a study by Emiliano *et al.* (2014), the main failures identified in the process of delivering goods by road transport were: lack of employee training, incorrect use of logistics equipment, communication difficulties by digital means, delays in deliveries, deliveries of exchanged products, losses and breakdowns in the distribution of their products, and poor organization in distribution warehouses.

The exchange of merchandise by customers holds a participation share in the dissatisfaction of customers of the company studied. Even if the rates of exchange of goods are considered acceptable, the rejection and disapproval of the customer when such facts occur is relevant, given that they can compromise the business relationship with their customers, which

are predominantly large companies that maintain an important volume transport relationship, consequently with significant financial participation in the amount of sales of the company subject of this research.

By combating losses, the reflexes are noticeable in a considerable way in the organizations' financial performance. This statement was demonstrated in a study by Perguer, Rodrigues & Lacerda (2011).

The reports found in the company studied are in line with the notes of Rodrigues (2013), who explains that the losses and breakdowns within the carriers occur due to lack of training of employees on how to handle, arrange and load the cargo correctly inside the vehicle, the weight capacity that supports the cargo, and the roads that do not provide travel conditions.

The predictability of uncertainties is a constant, given that the daily setbacks of traffic explain, but do not justify delays in deliveries to customers, since they assume that there is the possibility of working with adversity forecasts, when establishing and committing to deadlines for collection or delivery of goods.

The results found by OLIVEIRA NETO (2015) presented 22 risks for road transport of heavy cargo verified in the control process through four performance indicators: delivery time, specific training, contractual aspects, and breakdowns.

In this archetype of understanding, Rodrigues (2013) reproduces his understanding about the delivery deadline, considering it a pre-established agreement between supplier and consumer, stipulating delivery date and times. Failure to comply with this agreement can bring losses for both, the consumer without his material and the supplier with excess inventory.

Brazil's macroeconomic setback over the last five years has caused an imbalance in organizations. Logistics service providers were immediately affected and thus the analyzed company is volatile to the setbacks arising from this conditioning factor. There is an evident restriction in relation to the mismatch between accounts receivable and accounts payable, arising from complex generating facts, which condition the company to temporary needs to resort to financial institutions, even if sporadically.

The uncertainty is in the condition of balancing the cash flow without compromising the partnership with the customers, due to preserving the commercial relationship and the non-commitment of financial obligations that may affect profitability. The delinquent terms of receipt and ephemeral obligations. This scenario entails restriction in investment power and can lead to the condition of competitiveness and sustainability to the extent that short and medium term investments are being kept in intrêmulo.

Autonomy is, without a doubt, a vital element for people to be creative, to strive for new possibilities, to improve their tasks, to make decisions that can leverage the business and differentiate themselves from their competitors. However, it is necessary to have a balance, a middle ground, so as not to encourage inertia or too much.

The direct interaction between the management and the operational units in relation to information flows demonstrates a gap in the speed of compiling data, especially data considered as losses, such as breakages, misplacements, exchanges and any and all product damage. It is important to emphasize that, even if all the goods handled and transported are insured, the losses mentioned in this paragraph are understood as losses for financial, economic and image reasons with customers.

The training provided by the company to employees when hired is unquestionable. However, one notices that two variables are essential to the evolution of conflicts in the compilation of data and ascertainment of results related to the daily processes of each unit, which are: the maturation of the employee in the company, probably getting used to the culture of bureaucratic activities; and the distance of the units in relation to the head office, which gives the fictitious impression that there is no great concern of the head office in relation to the subsidiary.

The condition of certain independence of the subsidiaries in relation to the parent company is notorious, since it was evident at the time that all subsidiaries were dismissed as participants in this research, which is understood as a limitation of this study.

Ratifying the assumption of the relevance of processes in organizational management, Baldam et al. (2014) elucidate on process in the statement that these comprise correlated activities, perceived in the business and organized with the purpose of satisfying the customer.

FINAL CONSIDERATIONS

The information pertinent to what happened in this study, by means of verified results, analyzed and confronted with the theoretical base, as well as the certification of the fulfillment of the proposed objectives and the contributions that will come from this writing.

It is understood that this study fulfilled the proposed research objective, since the results proposed in the central objective were identified, analyzed, and described:

The management processes under analysis were Movement and transport management; Acquisition and Management of Maintenance; Delivery line; Customer satisfaction in meeting delivery deadlines and alignment between areas and compliance with defined processes.

The identification of losses in road cargo transportation were made through the reports of the interviewees, indicated in the listed descriptions, which allowed the unfolding of the analysis of each of the terms, understood as losses.

The losses detected in the pairing of categories served as an instrument to meet this objective, befitting with the reports and description of the diagnoses of each of the items: Failures, Communication and Measurement of Merchandise.

The analysis of losses in the context of road cargo transport, revered as the core of the results, was based on the results described in the items named under losses. Intentions that were elucidated as they were demonstrated by the described reports of the information provided by the interviewees, due to two conditions: in the faithful reproduction of the narratives and in the interpretations of the information provided.

Even though this study does not intend to prove the losses differentiated from the seven losses defined by Shingo (1996), which is the framework of the Toyota Production System, elements were identified that deserve further studies that can prove the condition of a new condition of loss in organizations.

In this context, and in agreement with the study by Pergher *et al.* (2011), the eighth loss was evidenced in the STP precepts. In subsequent research, Machado and Tondolo (2014) pointed to the eighth and ninth loss in the precepts of STP, which are united under the aspect of the *mix* - product element, even though they are detached studies. Based on the studies cited, it can be stated that the communication element was identified as a conditioner of losses at different times and in different sectors of the company.

Another factor of loss is communication, evidenced in two areas of the company: in the relationship between the branches and the administrative management, where it is perceived delays in informing the rates of breakdowns, losses, and product misplacements, and waste with people management, which demonstrates distancing with the branches, resulting in disruptions in the flow of information and in the processes of human capital management.

The importance of in-depth investigation of procedures in the communication flows between the strategic business units, in relation to the tactical and strategic management of the organizations, is admitted. Another aspect is the inevitability of process management, and more, if possible, management by processes as an elementary factor of control of the organization's daily activities and actions. This demonstrates, in both cases, the vulnerability of communication and process control in allowing expenditures in productivity, from the financial aspect, with respect to the company's image and time expenditure.

It is understood that the contribution of this study suggests the possibility of expanding the research and strengthening the theory about the primordial elements in the balance of losses, by means of the identification and correction of the ruptures in the internal communication processes in organizations, regardless of the sector in which they operate.

As limitations of the study, the approach proposed in the study of not detailing costs was pointed out, identifying only which losses are highlighted in the organization's processes, and thus, there is a gap for future studies, which can be researched and analyzed by quantitative means the main costs of the main losses.

From the limitations and results identified in this study, it is understood as an opportunity to expand knowledge through future research with the following demands: Apply a survey covering two or more companies in the road cargo transport segment, from the perspective of process losses; Carry out studies aimed at deepening research on losses through the analysis of indicators of transport management processes; and Identify losses in the comparison between headquarters and branches and between branches using mathematical models.

REFERENCES

Agência Nacional de Transportes Terrestres. Atualização da tabela ANTT. 2021. Disponível em: https://in.gov.br/web/dou/-/portaria-n-496-de-19-de-outubrode-2021-353688048

Antunes Jr. J.; Alvarez, R.; Klippel, M.; Bortolotto, P. 2008. Sistema de Produção: conceitos e práticas para projetos e gestão da produção enxuta. Porto Alegre, Bookman.

Araújo, C. de F.; Rech, C.; Venturini, S. F. 2018. As sete perdas do Sistema Toyota de Produção no processo de produção de cerveja artesanal. Revista Cippus – Unilasalle Canoas, v. 6 n. 1. Disponível em: https://revistas.unilasalle.edu.br/index.php/Cippus/article/view/4565/pdf

Baldam, R.; Vale, R.; Rozenfeld, H. 2014. Gerenciamento de processos de negócios BPM: Uma referência para implantação prática. Rio de Janeiro: Elsevier.

Barbosa, EDS; Sousa, CV 2011. Infraestrutura logística em transporte Rodoviário de Carga Fracionada: Um Estudo de Caso em Uma Transportadora Mineira. Minas Gerais:

XXXI Encontro Nacional de Engenharia de Produção. Disponível em: http://www.abepro.org.br/biblioteca/enegep2011_tn_sto_135_857_17958.pdf.

Barros, A. J. P.; Lehfeld, N. A. S. 2000. Fundamentos de Metodologia: um guia para a iniciação científica. 2.ed. ampl. São Paulo: Pearson Education do Brasil.

Brasil . Lei N° 11.442, de 5 de janeiro de 2007. Disponível em: http://www.planalto.gov.br/ccivil_03/_ato2007-2010/2007/lei/l11442.htm.

Brasil. Lei Nº 12.587, de 3 de janeiro de 2012. Disponível em: http://www.planalto.gov.br/ccivil_03/_Ato2011-2014/2012/Lei/L12587.htm.

Confederação Nacional do Transporte. Conjuntura do Transporte: desempenho do setor. Disponível em: https://cdn.cnt.org.br/diretorioVirtualPrd/6b30accf-d38d-48c9-9a31-7d524d948c1b.pdf.

Confederação Nacional do Transporte. 2021. PIB do transporte registra crescimento no primeiro trimestre de 2021. 2021. Disponível em: https://cnt.org.br/agenciacnt/pib-do-transporte-registra-crescimento-2021

Correia, J. V. F. B. 2018. Contextualização dos princípios da construção enxuta: aplicação da filosofia enxuta do Sistema Toyota de Produção na indústria da construção civil em exemplos práticos. Ciências exatas e tecnológicas, Aracaju, v. 4, n.3, p. 29-38. Disponível em: https://periodicos.set.edu.br/cadernoexatas/article/view/4826/2730

Costa, C.C.; Guilhoto, J.J.M.; Burnquist, H.L. 2015. Impactos socioeconômico de reduções nas perdas pós-colheita de produtos agrícolas no Brasil. Piracicaba/SP: RESR. Vol. 53, nº 03, pág. 395-408. Disponível em: https://www.scielo.br/j/resr/a/SGP5xjNt33D7yxMPpP9Bn8F/?format=pdf&lang=pt

Cotrim, F.V. et al. 2018. Otimização do Transporte Rodoviário de Carga: um estudo sobre a ociosidade dos ativos logísticos sem transporte rodoviária de carga fracionada no Brasil.

https://repositorio.itl.org.br/jspui/bitstream/123456789/293/1/Otimiza%C3%A7%C3%A3o%20do%20transporte%20rodovi%C3%A1rio%20de%20carga.pdf.

Emiliano, WM Mellies, A. Borghezan, P. Gretter, RB Machado, A.V. 2014. Eficiência dos serviços emprestados pelos operadores logísticos a empresa de plásticos em Joinville. Revista Verde de Agroecologia e Desenvolvimento Sustentável. Mossoró /RN. v 9., n. 2, pág. 36-44. Disponível em: https://www.gvaa.com.br/revista/index.php/RVADS/article/view/2704/2158

Ferreira, AC e cols. 2018. Transformando informação em conhecimento como forma de gerar vantagem competitivo sem transporte rodoviário de cargas. Trabalho de conclusão de curso, do Programa de Especialização em Gestão de Negócios, Fundação Dom Cabral. Curitiba. Brasil. 2018. Disponível em: https://repositorio.itl.org.br/jspui/handle/123456789/292.

Fleury, PF 1999. Vantagens Competições e estratégias no uso de operadores Logísticos. Revista Tecnologística. São Paulo: v.5, n.46, p. 28-35. Disponível em: https://www.ilos.com.br/web/vantagens-competitivas-e-estrategicas-no-uso-de-operadores-logisticos/

Flick, U. 2013. Introdução à metodologia de pesquisa: um guia para iniciantes. Porto Alegre: Penso.

Fundação Dom Cabral. Custos Logísticos No Brasil 2017: Núcleo de Logística, Supply Chain e Infraestrutura. Disponível em https://www.fdc.org.br/conhecimento-site/nucleos-de-pesquisa-site/Materiais/pesquisa-custos-logisticos2017.pdf

Guedes, G. 2021. Brasil See More Econômico. Greve de caminhoneiros colocou a Petrobras em xeque e expôs dependência. Disponível em: https://economia.ig.com.br/2018-12-19/greve-dos-caminhoneiros-retrospectiva.html. acesso em: 06 de setembro de 2021.

Köche, J. C. Fundamentos de Metodologia Científica: teoria da ciência e iniciação à pesquisa.

20.ed. atual. Petrópolis, RJ: Vozes, 2011.

Machado, C.; Tondolo, V. 2014. Perda por ruptura em gôndola: uma análise do Sistema Toyota de Produção na indústria alimentícia e varejo supermercadista. GEPROS. Gestão da Produção, Operações e Sistemas (Online), v. 9, p. 15-28. Disponível em: https://www.researchgate.net/profile/VilmarTondolo/publication/268510172_Loss_for_rupture_in_gondola_an_analysis_of_Toyota_Production_System_in_food_industry_and_retail_supermarket/links/546dd2280cf2a7492c5603b3/Loss-for-rupture-in-gondola-an-analysis-of-Toyota-Production-System-in-food-industry-and-retail-supermarket.pdf

Moreno, R. G. 2018. Análise da aplicação do sistema Toyota de produção na indústria com base na montagem interativa de bloquinhos Lego®. Revista Hispeci & Lema on-line, v. 7, n. 1. Disponível em: https://unifafibe.com.br/revistasonline/arquivos/hispecielemaonline/sumario/45/25012017121532.pdf

Ohno, T. 1997. O Sistema Toyota de Produção: além da produção em larga escala. Porto Alegre: Bookman.

Oliveira Neto, G.C; SHIBAO, F.Y. 2015. Mitigação de riscos operacional: estudo de caso em um operador logística de transporte rodoviário de carga pesada. Produto & Produção. Porto Alegre/RS. vol. 16 n.2, pág. 24-55. Disponível em: https://www.seer.ufrgs.br/index.php/ProdutoProducao/article/view/49589/34142

Oliveira, D.P.R. 2007. Administração de Processos. 2. ed., São Paulo: Atlas.

Paris, W.S. 2016. Conceitos que formam a base no Sistema Toyota de Produção. Curitiba: Qualidade Cronos. Disponível em: https://www.cronosquality.com/artigos/stp01.pdf.

Pergher, I. Rodrigues, L.H. Lacerda, D.P. 2011. Discussão teórico sobre o conceito de perdas do Sistema Toyota de Produção: inserindo a lógica do ganho da teoria das restrições.

Revista Gestão & Produção. São Carlos. v. 18, n. 4, pág. 673-686. Disponível em: https://www.scielo.br/j/gp/a/WDzHYGjkxGm89yKVG778ZtH/?format=pdf&lang=pt

Polancich, S.; Leming-Lee, T.; Pilon, B. 2019. The Application of the Toyota Production System LEAN 5S Methodology in the Operating Room Setting. Nursing Clinics, v. 54, n. 1, p. 53-79. Disponível em: https://www.sciencedirect.com/science/article/abs/pii/S0029646518301014?via%3Dihub

Rodrigues, E.; (Org). 2013. Estudando logística a partir de artigos: Coleção de casos e estudos. São Paulo: NPEL.

Shingo, S. 1996. O Sistema Toyota de Produção do ponto de vista da Engenharia de Produção. Porto Alegre: Bookman.

Valente, A.M. Passaglia, E. Novaes, A.G. 2003. Gerenciamento de Transportes e Frotas. São Paulo: Pioneira Thomson Learning.

Yin, R.K. 2015. Estudo de Caso: planejamento e métodos. Trad. de Daniel Grassi. 5. ed. Porto Alegre: Bookman.

Ziegler, C.; Ueda, R. M.; Souza, A. M.; Rosa, L. C. 2020. Identificação de Perdas por Meio do Sistema Toyota de Produção: Um Estudo de Caso em um Apiário. Revista FSA, Teresina, v. 17, n. 1, art. 10, p. 195-216. Disponível em: http://www4.unifsa.com.br/revista/index.php/fsa/article/view/1914/491492083