

Evaluation of Logistical Operations in the Distribution Center of the Bahamas Group in the City of Juiz de Fora – MG, Brazil

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Abstract

The present work consists of a descriptive-analytical study in the distribution center of the Bahamas Group, a retail company in Juiz de Fora (MG), which currently has locations distributed throughout the Zona da Mata and Triângulo Mineiro. The paper aims to answer the following question: Are the receiving, addressing, storing, separating and shipping logistics operations at the Bahamas Group's distribution center in line with conventional theoretical standards? Starting from the main objective, which is to portray the participation of logistics in the distribution center of the Bahamas Group, this study outlines the following specific objectives: to describe the operations of distribution and storage in the Bahamas Group; to identify the qualities and shortcomings of distribution and storage operations. The work was compiled on the theoretical bases of renowned authors in the area, focusing in particular on the aspects related to logistics, in addition to the methodology of descriptive-analytical research, in order to fulfill the objectives of the study. Subsequently, the distribution and storage operations within the Bahamas Group have been described. Then, before arriving at the final considerations, a pairing with the theoretical framework was made, in line with the theory put into practice. As a conclusion, significant growth was identified as a result of the creation of the distribution center.

Keywords: logistics, retail supermarket, operational process

1. Introduction

With an emphasis on logistics operations, the present study was carried out at the distribution center of the Bahamas Group in the city of Juiz de Fora (MG), which is characterized as a company focused on serving the final consumer of the retail segment in its distributed stores, currently located throughout the Zona da Mata and the Triângulo Mineiro.

This work is based on the problem in question - Do the logistical operations for receiving, addressing, storage, sorting and shipping at the Bahamas Group's distribution center, located in the city of Juiz de Fora, follow theoretical standards, based on the work of authors such as: Alvarenga and Novaes, Ballou, Dias, Gonçalves and Sucupira?

In view of the new market operational practices, this work is justified by the analysis of the logistical processes of the Bahamas Group's distribution center, comparing it with the theoretical references proposed by the academic environment. Based on this assessment, this work seeks to understand the logistical processes in practice and to propose, on a theoretical basis, improvements in the organization's efficiency gains.

To achieve the main objective of this work, the bibliographic reference, qualitative research (through a semi-structured interview) and on-site observation with the active participation of one of the researchers, who entered as a trainee in the network, was used as a methodology. Soon after the internship period, he was hired as a collaborator.

Factors that contribute to these business conditions are addressed, such as retail definitions, operationalization of the distribution center and the mechanisms of operation, together with software programs. For the construction of the referential, consultation methods on secondary data were used.

The work is divided into six parts: in the first, the project is presented, giving a brief context and presenting the problem question; in the second, a review is made of logistics and distribution, in addition to operational processes; the third mentions the methodology used in the area of logistics; the fourth describes the distribution and storage operations; the fifth presents the empirical results and finally the final considerations.

2. Logistics and Distribution

As a theoretical basis for the development of this study, it was necessary to understand the evolution of logistics operations over the years. With an emphasis on distribution and describing the characteristics of retail and the importance of distribution centers, this chapter covers the following aspects: evolution of logistics, retail distribution, operational processes in distribution centers, information systems, receiving, addressing, storage, sorting and shipping.

According to Morais (2015), logistics emerged from the earliest civilizations of mankind, according to the records of the Phoenicians, Greeks and, later, Romans, who used ships to transport goods between their ports for the economic development of their civilizations. On the other hand, despite this distant historical origin, the concept of logistics only came to be seen with more importance after the Second World War, when the ability to assist companies in a strategic way was introduced: “with the end of the second war, the soldiers returned to social life, taking with them and disseminating certain concepts originating in the army with companies: tactics, strategy and logistics” (MORAIS, 2015, p. 21).

On this aspect of its long-standing origin, but relatively current dating from the Second World War, Fleury et al. (2000, p. 27), thus defines logistics from its contradiction: it is “one of the oldest economic activities and one of the most modern management concepts”. For researchers, the role of logistics can be exemplified in several ways, being one of the areas with the greatest influence on the progress and competitiveness of the commercial chains in the current scenario, being the production, supply and distribution channels.

2.1 Retail Distribution

Distribution channels are defined as the paths that products and/or services take from their production to the final consumer. These paths, which can be like “a set of interdependent organizations involved in the process of making the product and/or the service available for consumption or use”, are established according to the options made available by the company, observing more viable strategies (STERN; EL-ANSARY and COUGHLAN, 1996, p. 1, apud BRASIL and PANSONATO, 2018, p. 48).

When the final consumer purchases a product, he also acquires within the purchase package the services provided by the company or third parties for delivery, which can be directly from the manufacturer to the final consumer or through intermediaries. This practice of selling to the final consumer or through intermediaries is configured as retail, which is characterized by a variety of specialized segments in order to establish options for the consumer in formats that best fit the consumer’s needs (STERN; EL-ANSARY and COUGHLAN, 1996, p. 1, apud BRASIL and PANSONATO, 2018, p. 48).

As for retail, Kotler and Keller (2013) define it:

Retail includes all activities related to the sale of goods and services directly to the final consumer, for personal and non-commercial use. [...] any organization that sells to end consumers - be it a manufacturer, wholesaler or retailer - is involved in retail [...] is any commercial enterprise whose sales volume comes mainly from retail (KOTLER and KELLER, 2013, p. 482).

According to Kotler and Keller (2013), consumers have options to purchase goods and services in retail stores and through non-store retailing. Retail stores offer four service formats: self-service, self-selection, limited service and full service. Non-store retailing is currently widely used in new business models via e-commerce.

For Parente (2000), Brazil has followed the global trend, presenting a complex variety of store models that adapt to market needs and regional and socioeconomic characteristics. As for supermarkets that have characteristics of food stores with a good variety of products, this format represents a quarter of Brazilian food retailers. Other models, such as compact supermarkets, are characterized by presenting a complete line of products, but with a variety of reduced brands. Wholesalers, on the other hand, are large stores that sell retail to end consumers and also wholesale to merchants. Thus, presenting a wide variety of products and low prices, as well as using the progressive discount method - the greater the quantity purchased, the lower the price paid -, these stores are characterized by serving institutional customers.

2.2 Distribution Center (DC)

Arnold (1999) points out that the distribution centers aim to reduce costs and optimize customer service. To achieve these objectives, the process must be effective in service, in the control of items and in using the means of movement, in order to reduce physical effort and provide satisfactory service to customers.

According to Bowersox and Closs (2004), with the implementation and proper use of logistics processes, it is possible to assess the company's ability to provide a superior service at the lowest possible cost.

For Gurgel (2000), there was an evolution in shipments from factories to distribution centers, absorbing both the production of several units of a corporation and items purchased from third parties.

According to Alvarenga and Novaes (2000), the distribution center is the most important link in the logistics network, generating a process with multiple functions within the logistics chain.

In line with this, the importance of centers in the operations of organizations and their operational processes is highlighted.

2.2.1 Operational Processes at Distribution Centers

The operating system (Figure 1) Warehouse Management System (WMS), manages the operational processes of receiving, addressing, storage, sorting and shipping.

According to Sucupira (2003), systems, until the mid-1970s, had only the ability to provide inputs, outputs and losses in the movement of stocks. Since then, the first systems with a DC addressing capacity appeared, which conceived the possibility of creating addresses for each product, allowing more agility in the separation and possibility of distribution to different places, since all the "addresses" are registered in the system and identified by computers.

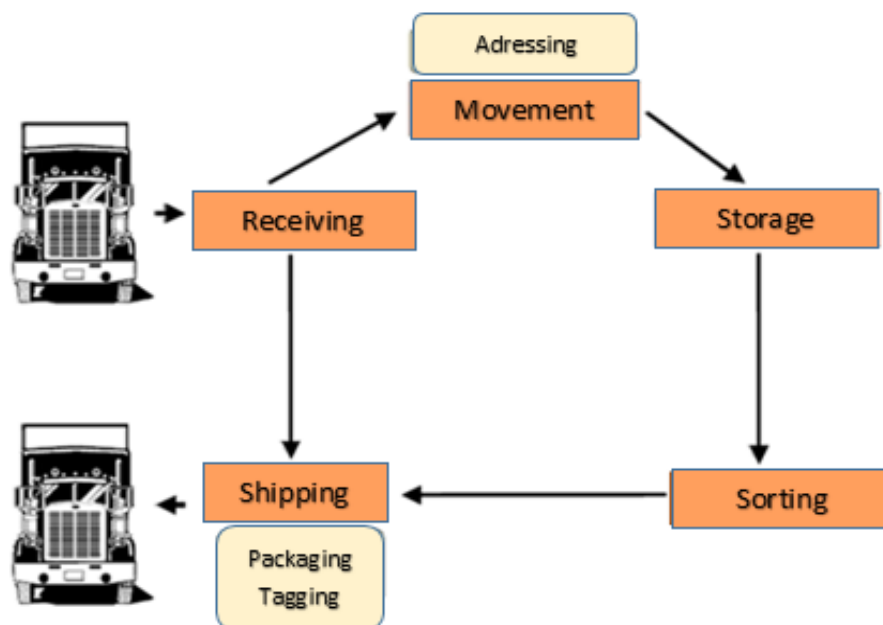


Figure 1. Main activities at a distribution center

Source: Barros (2005).

2.2.1.1 Information System

Vieira and Roux (2011) define the Warehouse Management System (WMS) as:

[...] software that will determine the optimal storage addresses for each of the references, according to all the established criteria, such as: turnover rate, size, weight, category [...] (VIEIRA and ROUX, 2011, p. 247).

For Hoelz (2015), the WMS software consists of a tool for business intelligence, quickly compiling and managing data through tables, used as a support base for multiple-aspect codes.

In addition, Gonçalves (2013, p. 194) mentions the managerial characteristics regarding information and operations at distribution centers, with security and control of operations, providing accurate information regarding the level of

stock of goods, covering “all operations such as receipt of materials, addressing of destination and location, storage, order separation, shipping and dispatch of materials”.

All of these processes are carried out with the assistance of the WMS, which aims to reduce bottlenecks related to operations, adequately sensitizing manpower and optimizing handling equipment.

With the technological development in the storage and distribution process, there is an improvement in equipment to assist both in handling and storage in distribution centers, with the introduction of hardware (readers and collectors, among others), and in software, as in the use of the WMS.

2.2.1.2 Receiving

For Alvarenga and Novaes (2000), receiving consists of the process of unloading the goods at the distribution center, usually using docks for unloading. It consists of an elevated platform, where the cargo vehicles pull in reverse at 90 degrees. In some cases, vehicles may touch the platforms at an angle of 45 degrees. For Alvarenga and Novaes (2000), the objectives of receiving are:

[...] remove the cargo from the vehicle, check the goods, sort it (in some cases), marking the zone, region or box related to the destination. This last operation takes place at the warehouse that works with the physical distribution of products in transit (ALVARENGA and NOVAES, 2000, p. 124).

The receiving process needs to be agile, in order to avoid loss of sale and lack of merchandise to supply store demand. There are several types of accommodation and means of movement, Ballou (2004, p. 389), adds that “the variety of mechanical equipment available for loading and unloading, order picking and goods handling in the warehouse is huge”.

Ballou (2004) interprets that the use of handling equipment is distinguished by the degree of specialized use and the extent of the human strength required to operate it. There are three categories of equipment - manual, mixed (with energy aid) and fully mechanized - the use of only one of these types of equipment being rare.

According to the aforementioned author, manual equipment, such as two-wheel carts and four-wheel pallet trucks, ensures mechanical advantage in handling and requires little investment. Although its flexibility and low investment make this equipment the best choice, when there is a variety of products, its use is limited by the physical capacity of the operators.

Mixed equipment, such as cranes, industrial trucks, elevators and winches, are characterized by increased speed and efficiency in handling materials and profitability of the hours worked, however the most used is the mechanical forklift and its variations. Ballou (2004), describes its technical characteristic:

[...] allows the stacking of high loads (more than 12 feet, or 3.65 meters) and moving loads of substantial size. The most common mechanical forklift has a load capacity of about 3,000 pounds (1,365 kg) (BALLOU, 2004, p. 390).

According to Ballou (2004), mechanized equipment, which reaches almost total automation, is technological and safer in material handling. They are used for the heaviest loads and for loads that need to be lifted to a higher elevation, being able to lift up to 16,000 Kg and reach the highest accommodations of the pallet trucks.

2.2.1.3 Addressing

For Gonçalves (2013), with the benefit of the warehouse control system for the receiving of cargo, automatic addressing is provided, which uses criteria, including the allocation of each product in the different structures and approximation of products with similar incidences of output. Gonçalves (2013) defines addressing as "operational criteria as first to enter, first to leave, the weight of products, picking systems and etc." (2013, p. 195).

According to Russo (2013), two types of addressing are generally used: fixed (consists of predetermining a location) and free (without the prerogative of determining places for storage, using empty spaces in the most assertive way, taking into account that you will need to a system to locate all of these allocated products).

2.2.1.4 Storage

Regarding the storage process, Bowersox and Closs (2004), highlight the need to:

[...] consider the characteristics of the products, particularly those related to volume, weight and storage conditions. The volume of products is the main factor to be taken into account when defining a storage plan. High demand products should be stored in places where the distances to be covered are shorter, such as close to exits, and on low racks or pallet trucks. Thus, not only are route distances shortened, but the need for vertical movement of products is also

reduced. On the other hand, low rotation products can be placed in places far from exits or on higher shelves or pallet trucks (BOWERSOX and CLOSS, 2004, p. 331).

For Ballou (2004), the storage and handling of goods are essential points for the supply chain, so that storage is exposed as an initial act, making it possible to absorb up to 20% of physical distribution costs. The best packaging of these products is by way of pallets, which Ballou (2004) defines as:

A portable platform, usually made of wood or corrugated material on which materials for transportation and storage are stacked. Goods are often placed on pallets when they are manufactured and remain palletized until order fulfillment makes it necessary to split quantities (BALLOU, 2004, p. 386).

In Brazil, the standard pallet, with dimensions of 1200 by 1000 millimeters, has a size and configuration determined by the capacity of the handling equipment. According to Dias (1993), the main advantages for the use of pallets are savings in time, labor and space for storage, which can be organized and allow for the formation of tall and safe piles, providing security and agility in handling, in addition to saving time in loading and unloading trucks.

According to Russo (2013), when unloading, the handling equipment that best suits the needs of each load must be chosen, allowing the use of hand pallet trucks, electric pallet trucks and forklifts for the handling of loads.

According to Dias (1993), the layout of the distribution center must be analyzed to choose the best means of movement, taking into account the following aspects: characteristics and dimensions of the products, space between buildings and floor resistance. The arrangements are determined depending on certain factors, such as cargo size, weight, unit load, loss of space, compactness and mooring methods.

Ballou (2004) states that the storage and handling of products must be synchronous, with storage being simply a temporary stop in the flow of warehouses, where the packaging of goods is allocated on shelves.

Shelves are the most important accessories for storage:

[...] are normally metal divisions, where the products are placed. When a wide variety of items in small quantities need to be stored, stacking loads on top of each other is an ineffective practice. Shelves promote floor-to-ceiling stacking, and items in the highest or lowest compartments are equally accessible, although items with a higher turnover should be placed near the bottom in order to reduce total shelf-life. Shelves also assist in stock rotation, as, for example, in a FIFO inventory control system (first in, first out, or FIFO) (BALLOU, 2004, p. 389).

Arnold (1999) argues that the physical arrangement of the distribution center is predetermined by the need to allocate each commodity.

According to Dias (1993), after a series of studies, it was defined that the best storage model, in order to provide greater performance, would be the perpendicular model, joining the pallet stacking system with the shelf, thus, the pallet racking structures, which improved the use of the heights of the warehouses. The pallet rack structures are “assembled by perforated angles, attached to each other by fitting or screwing, which gives a modular characteristic” (DIAS, 1993, p. 183). They are used for selective storage when stocking a wide variety of items, and also allowing for items in small quantities. Being able to reach 25 to 30 meters in height, these structures are layers of buildings among which are the corridors, whose number depends on the number of buildings, and whose width is determined by the handling equipment used for handling the load (DIAS, 1993, p. 183).

Consequently, Dias (1993) mentions that storage does not present a variety of items, so that for items with the same batch and validity the dynamic system is more efficient, which is similar to the conventional one but without the aisles. The dynamic system or sliding pallets are structures with the side members tilted and equipped with mechanical or hydraulic casters or rollers, using gravity to reach the bottom of the structure or even another pallet, and retardants are used to avoid damage to the load.

Dias (1993) lists another structure that uses gravity action, known as the flow rack, which uses the same dynamic system, but ideal for small volumes and fractionated loads. The loads are stored at the rear of the structure, moving to the front of the shelf, slightly inclined, thus allowing the load, with the help of rollers, to always be at the front of the structure.

According to Brasil and Pansonato (2018), to facilitate storage, the unitization of cargo is beneficial. This method consists of unifying the loads, which generates not only dynamism and space at the time of loading, but also greater accuracy in handling and checking the load, making the process safer and more reliable, in addition to preventing losses.

For Luchezi (2015), a picking area is essential for distribution centers, which arose from the need to change demands, such as increasing the number of orders, increasing the assortment of items and agility in the process. The elaboration of spaces designated for picking means that an area is reserved for this activity.

There are products whose storage depends on a cold chamber, which consists of a refrigerated space with internal conditions that allow control of the expiration of perishable products. There are basically two types of chambers: cold and frozen chambers. While cold chambers protect food and products at temperatures close to 0 °C, frozen chambers prolong the period of storage of food at temperatures that can reach -18 °C, according to Wikiartigos.

2.2.1.5 Sorting

According to Lima (2002), order separation should take into account the time employees spend looking for them, in order to improve their productivity, simultaneously collecting several orders. For this, there are three methods of separation: the discrete method (each operator separates one order at a time, being simpler and less prone to errors); the zone method (designated for a specific area, the operator leaves the items grouped in different areas, allowing multiple operators to collect the same order); finally, the batch method (operators collect orders together, minimizing operators' travel time, but increasing the possibility of errors).

For Moura (1997), the definition of order separation consists of separating and combining smaller loads, unitizing them to meet a customer's order, which should be done in any type of warehouse where items move from one location to another: "Order picking and the movement of whole unitized loads are natural partners in the replenishment cycle and, often, in the dispatch of finished orders" (MOURA, 1997, p. 221). Efficiency in order picking in logistics is essential to avoid errors.

2.2.1.6 Shipping

For Luchezi (2015), the expedition area is the area where products already destined for shipping are stored. Access to this space is only allowed for authorized persons, and the materials already arrive there with destinations ready and with the tax documents of delivery. Bowersox (2007) defines shipping as a process for checking and loading goods in vehicles, carried out, in most systems, manually. As the unitized cargo shipping process reduces vehicle loading times considerably, it is becoming more and more common. While the common cargo consists of volumes and boxes loaded directly from the platform to the vehicle, the unitized packages contain groups of products (BOWERSOX, 2007, p. 350). An organization's outflow must occur steadily, safely and reliably. Thus, it will be able to supply demand efficiently, which directly results in its gains.

3. Methodology

The present work was based on the bibliographical investigation of influential authors in books and magazines on the defined theme. This phase consisted of the elaboration of a theoretical framework capable of assisting in the evaluation of logistical operations at the distribution center of the Bahamas Group in Juiz de Fora.

The studies started with the researcher-participant Fabio Roberto Costa de Carvalho who, carrying out an internship program at the Bahamas Group, proposed to do an analytical descriptive study with an emphasis on logistics, matching theory with practice, with the aim of describing and identifying the qualities and deficiencies in the company's logistics.

After the company's approval to carry out the study, qualitative field research was carried out, by way of a semi-structured interview with the logistics manager, from which, permeating all the processes performed, the entire logistics chain was explored. Then, aiming to collect as much information as possible, a script was developed whose answers sought to clarify questions presented and was complemented with other issues related to the theme.

The interview was conducted in person and lasted about three hours, with the respondent responding to a semi-structured script of questions, the answers of which were transcribed. Soon after, a visit was carried out throughout the entire distribution center. There was a participant observation in the field, at the distribution center, which was designed with the aim of relating the theory to the practice adopted by the company, as a way of making the research viable.

In the next phase, after mapping the organization, an analysis of the results was elaborated, from which information obtained in books and magazines was compared with the interview on the topic.

In the last phase, in order to meet the proposed objective and answer the problem question, all the data obtained through the methods used was reviewed.

As a way of obtaining information in order to answer the question of whether the logistical operations of receiving, addressing, storage, sorting and shipping at the Bahamas Group's distribution center in Juiz de Fora follow the theoretical standards, the following methods were used: bibliographic research, field research and participatory observation.

Research is an activity aimed at investigating theoretical or practical problems through the use of scientific processes. It starts, therefore, from a doubt or problem and, using a scientific method, seeks an answer or solution (CERVO; BERVIAN; DA SILVA, 2007, p. 57).

According to Cervo, Bervian and Da Silva (2007), descriptive research must be well oriented to obtain correct and faithful results. The planning must contain data collection, an intermediate phase of descriptive research:

[...] occurs after the choice and delimitation of the subject, the bibliographic review, the definition of objects, the formulation of the problem and hypotheses, the grouping of data into categories and the identification of variables [...] (CERVO; BERVIAN and DA SILVA, 2007).

Fabio Roberto Costa de Carvalho, a member of the group of researchers, works as an administrative assistant at the Bahamas Group's distribution center in Juiz de Fora. Thus, he acted as a participating researcher, analyzing the processes daily and onsite.

3.1 Characterization of the Company

In relation to the company studied, the Bahamas Group takes part, with a 17% stake, in the 4th largest cluster of Brazilian supermarkets - Rede Brasil de Supermercados - which consists of the union of 16 chains spread across the territory. In order to achieve better purchasing conditions, the members, respecting each other, are united in an agreement under which a certain group cannot operate in the same city where another member already operates.

In an interview dated 9/17/2018, the then logistics manager informed that the Bahamas Supermarket arose from the union between two businessmen - Paulo Lopes and Jovino Campos - in March 1983, initially as a bar, in the Santa Luzia neighborhood, in Juiz de Fora (MG).

Over time, the initial venture was transformed into a grocery store, later into a market and then a supermarket, currently reaching the rank of one of the largest retail chains in Brazil, according to the Brazilian Supermarket Association (ABRAS 2018), with more than 7,000 direct and indirect employees.

The Bahamas Group operates with several store segments, with the traditional format bearing the Bahamas label. In the concept of premium stores, there is the Emporium format, offering differentiated products and other services, and the Bahamas Mix format, with wholesale and retail sales, offering progressive discounts as a differential based on the concept of the greater the purchase volume of the same product, the greater the percentage of the discount applied on it. Finally, the Express format, the newest concept of compact stores focused on quick purchases, aiming to meet the changing habits of consumers who value speed and agility in their daily purchases.

In July 2013, the chain expanded to the Triângulo Mineiro, starting with the city of Uberlândia, where it currently has 7 stores, and later extended to the cities of Uberaba (with 4 stores), Patrocínio, Araguari and Ituiutaba, respectively (1 store in each city). Thus, today the Bahamas Group is composed of two regional groups: one in Zona da Mata, with 38 stores, 22 in Juiz de Fora, 02 in Viçosa, 01 in Ponte Nova, 02 in Cataguases, 02 in Ubá, 02 in Além Paraíba, 02 in Barbacena, 01 in Leopoldina, 02 in Muriaé and 02 in São João del Rei; 01 in the Triângulo Mineiro.

In 2010, in the Industrial District of Juiz de Fora, the distribution center was opened, whose structure (29,750 m² of a built area with 67 docks for shipping and receiving goods) and strategic location (on the margins of the BR-040 highway) favor the flow demand to supply 100 stores.

4. Description of Distribution and Storage Operations in the Bahamas Group

From the information collected through the field research, it can be said that the distribution center receives a flow of approximately 100 trucks a day from suppliers, and approximately 80 of its own trucks leave for the stores in the Zona da Mata region and the Triângulo Mineiro region. When entering the distribution center, the drivers of these trucks must deliver the physical invoice (paper) to the Data Processing Center (DPC). Then, the trucks receive a numerical identification responsible for the order of release from the receiving sector for unloading.

Called by the head of the receiving section, the trucks are sent to one of the 33 docks assigned to the suppliers. In relation to loads, they are divided between beaten loads (stacked one on top of the other during transport) and palletized (compacted on pallets, to better organize the stock and facilitate the movement of the load in and out of the stock). Two

types of pallets are used: the PBR model, introduced in Brazil in the 1980s, and the return pallet, rented and returned after unloading.

In addition, it is necessary to observe the type of truck that carries the cargo: Saider trucks (which allow loading and unloading from the sides), and those that allow for docking (they have a mobile ramp at the rear, which is attached to the dock). It should be noted that the fleet consists of 140 trucks that carry out cargo transportation, distributed among box trucks and 3-axle trucks.

As the unloading takes place, the pallets are allocated on lines for checking expiration dates, quantities and damages, and this process is carried out by a logistician. The Bahamas hires a third party company, which performs the unloading and invoicing procedure according to the number of trucks unloaded.

After unloading the truck, the checker, together with the head of the session, authorizes the DPC to dispatch the signed invoice to release the truck if everything is correct. In the absence of products, another check is carried out, and a new checker is called to count the goods, without being informed about the difference in quantity in relation to the first count. The method is repeated a maximum of 3 times, if necessary; if the fault is found, it is reset in the next request. If there is a surplus of merchandise, it is returned to the truck itself.

With the discharge completed, the Inventory Planning and Control (IPC) is responsible for analyzing the disposition of the goods to be allocated, forwarding the pallets to the respective areas: standard, dynamic storage, flow rack and cold chambers. The structure of the storage sector contains streets divided into buildings, which are identified by an alphanumeric sequence so that the goods are packed in pallet trucks separated by departments.

The allocation of pallets is based on the FEFO concept (first expired, first out), that is, products with the closest expiration dates are the first to leave, unlike FIFO (first in, first out). According to the logistics manager, this is due to the dynamics of a supermarket: suppliers can offer price conditions for those products that have reduced validity, generating commercial conditions for sales and promotions. The Bahamas Supermarket uses as a criterion the receiving of products with at least one-third of the expiration date.

In the dynamic storage area, FIFO (first in, first out) data management is used, with unitized load (with little variety of products), using inclined planes with rollers and with speed control systems. This allows the load to slide under gravity, keeping the pallet at a constant and safe speed. In this structure, high-turnover products (with higher sales volume) are allocated, and there can be no errors when storing on the conveyor since any deformity in the pallets hinders the roll and the process of handling the load. This structure has a capacity of 6 rows, each comprising 12 pallets of 4 floors.

Flow rack storage is a structure designed to separate products manually, being fed from the top, so that loads slide by way of gravity on rollers to the other end. This equipment is used by the Bahamas to pack products with greater added value, and that are easily lost and fragile. The goods are in organizing boxes with products of the same specifications.

For receiving frozen and chilled goods, there are 10 streets, with 4 frozen buildings and 6 cold storage buildings, which operate at $-23\text{ }^{\circ}\text{C}$ and $-3\text{ }^{\circ}\text{C}$ respectively. The storage process for perishable products is similar to the storage of dry cargoes: at the time of unloading, perishable products, as they are refrigerated, cannot remain out of storage for a long time.

The ordering processes for stores take place using proprietary software, which prepares orders daily according to the turnover of each product in a given sales period. A system called voice link is used, which helps in the separation of products according to each order. This system consists of a headphone with a virtual assistant commanded by voice, which guides the employee, in a coordinated way, in the collection of allocated items, carrying out the orderly movement through the streets of the distribution center. At the lowest level of each building is situated the picking area, which consists of a space for product collection points that, according to the inventory date turn, are the next to leave.

The separate products are grouped in the shipping area to be organized on pallets, which are assembled with lashing in ballast and layers, preventing damage and tipping during transportation. Routing and drivers are predefined by area managers. Due to location and time, or whether loading and unloading areas are located on busy streets, or even by rules established by the municipalities where the stores are located, some stores restrict access to box trucks and small trucks only. One truck is designated to meet the demands of two stores. If the trucks have space for idle loads, they wait for release until the space is filled.

Products such as dairy and cold products are delivered directly to the stores by the suppliers themselves. The fruit and vegetable products are passed on by a specialized company, which is responsible for the entire distribution and allocation chain in stores, where it yields a percentage of sales to the Bahamas Group.

In relation to losses and damages, the goods are listed and sent to the DC in the same trucks that make the deliveries. The products, when they reach the DC, are separated between the suppliers. These refund exchanges; those who, for contractual reasons, do not pay the losses and damages are discarded.

5. Empirical Results of Work

In relation to stores, the Bahamas chain has personified its service through its formats, substantiating what was reported by Parente (2000), which presented the growing retail trend with store formats that seek to personalize customer profiles.

It was observed that the distribution center is an important link between suppliers and physical stores in the Bahamas chain, used to absorb demand for supplies from stores, which is in line with the theory of Alvarenga (2000).

According to Arnold (1999), the physical arrangement of the distribution center has a unique characteristic, although it may undergo variations to better suit the needs of each branch of operation. Among supermarket DCs, layouts have few varieties, so the Bahamas Group's DC is in line with current DC configurations.

The management of operational processes at the distribution center is directly related to the WMS. According to Gonçalves (2013), the use of the system allows the optimization of the movement of goods, allowing precise location of products. The Bahamas Group has a system developed with exclusivity that provides the entire procedure, from the arrival of suppliers, permeating the allocation of goods, until their dispatch to stores.

Regarding the concept of unloading, according to Alvarenga and Novaes (2000), unloading occurs according to the traditional methods and equipment used in the distribution center, which is shown to be efficient due to the number of docks available for the procedure in order to carry out the procedure, in addition to the equipment used and means of using it.

According to Ballou (2004), the storage and movement of goods provide costs for the operation of a DC, given the company has its own distribution center, providing a reduction in operating costs, in addition to autonomy in space management.

The choice of handling equipment is determined by the weight and height of cargo allocation, and in this service demand, the Bahamas Group uses the traditional equipment used.

Although for Ballou (2004) the most used method for stock control in the distribution center is FIFO (first in, first out), the Bahamas Group uses FEFO (first expired, first out). This scenario is possible through negotiations with suppliers, making it possible to purchase products with shorter validity, improve the sales condition and, consequently, increase the sales turnover of the product, keeping the stocked goods for a shorter time.

According to Dias (1993), products with the same validity and lot must be stored in the dynamic method in order to promote greater speed in the movement of goods, this was a system adopted by the company.

Another structure used by the Bahamas Group to store small volumes and fractional loads is the flow rack, which allows greater control of specific products with substantial added value, mitigating losses.

Regarding cold chambers, the company uses the criteria that are in line with the concepts presented by Wikiartigos, where they follow the standards presented in relation to the established structures as well as in the storage process.

Regarding the concept of order separation, the procedure used by the Bahamas Group is related to the concepts of Lima (2002), in which the criteria for separation occurs according to the employee's distance to the product, which is dealt with by the use of the specific software, the voice link. In which, a virtual assistant commanded by voice, guides the employee, in a coordinated way, in order separation.

For the transport of goods in the aid of displacement, Fleury, Wanke and Figueiredo (2013) recommend the use of tracking software, which minimizes the time through more assertive route choices, enabling the company to supply stores with greater agility, managing to improve time reduction. Ballou (2006) considers the efficiency of freight transport that makes more deliveries by vehicles, optimizing costs.

6. Final Considerations

The application of this study offered student-researchers the opportunity to understand and evaluate the entire logistical operation that is used in an organization. Consequently, it is justified by providing greater knowledge to academics, by offering the opportunity to compare theory with practice performed by the company, observing the parity and incongruity of the operation.

The study of the Bahamas Group's distribution center with its logistics operation made it possible to add greater knowledge in logistics, substantiating significant theoretical and practical learning in the administration area.

With the development of the study, it was possible to observe the logistical activities making a match with the theoretical framework, so that it was possible to identify the activities performed in the logistics chain: the processes, corresponding to the approaches presented by the authors.

In order to answer the problem in question - Do the logistical operations for receiving, addressing, storage, sorting and shipping at the Bahamas Group's distribution center located in Juiz de Fora (MG) follow conventional theoretical standards?

As a result, the evolution of logistics was presented, with the distribution channels supporting retail being defined, in addition to the entire process pertinent to the distribution center, with the help of the warehouse management system, aligned with transportation.

When portraying the participation of logistics in the Bahamas Group's distribution center - an explanation of the warehouse's internal processes was obtained, from receiving to shipping and transport to stores.

The study proposed improvements in observed points that are subject to changes, such as improving the warehouse management software in terms of freeing up physical space, given that the system provides the write-off of goods numerically, without the release of the physical address of the previously stored product. That is, although the occupied address is virtually listed, the space is physically available. This is a bottleneck presented by the company, causing a delay in the addressing carried out by the IPC (Inventory Planning and Control), given the need for the visual check of the employee.

Another suggestion for improvement refers to the greater dynamism in the cargo receiving process, with the implementation of unloading schedules, according to the possibility of available space provided by the management system; this could be established according to the vacant spaces in buildings and dynamic storage. In line with this, we suggest the implementation of the automatic pallet wrapping machine, replacing the time spent by manual labor and ensuring greater use of the plastic film and standardization.

Another point of improvement is related to addressing, since, as proposed, addressing should be carried out in the act of unloading the goods, extinguishing the rows of pallets, which until then were addressed by the IPC, providing a reduction of time and use of physical space.

In conclusion, this work highlights the impact of logistics in the Bahamas Group's distribution center, through the creation of the DC, which allowed for vertiginous growth, due to the logistics network and the current technological management implementations, capable of providing the expansion of the network to other regions.

It was possible to identify that, through the creation of the distribution center, the company was able to add other types of banners, as a way to serve the different types of customers, providing new practices of operations and installations in different regions.

In line with these identifications, the company demonstrates a wide aptitude for new concepts and market trends for the future, due to the constant technological advancement and new practices in the active field.

For future studies, an analytical deepening of the operations has been suggested, aware that the organization is a living organism in constant mutation needing continuous improvement of its practices in search of competitive market differentials.

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