



AUTOMATION AND EFFICIENCY IN THE OPERATIONAL PROCESSES: A CASE STUDY IN A LOGISTICS OPERATOR

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ABSTRACT

Globalization has made the automations become increasingly feasible and with the technological development, many operations can be optimized, bringing productivity gains. Logistics is a major benefit of all this development, because lives a time extremely competitive, in which being efficient is a requirement to stay alive in the market. Inserted in this context, this article seeks from the analysis of the processes in a distribution center, identify opportunities to automate operations to gain productivity and offer a better working condition for employees.

Keywords: Automation, globalization, logistics, productivity



1. INTRODUCTION

This article about automation and efficiency in the operational processes flows focused on a case study of a logistics operator.

The process of development of efficiency and effectiveness in operations in companies not only involves managing people doing their management, but also the assessment of processes that have in the operation, in order to make them more productive and automated. When not carried out this investigation correctly and efficiently, the company is subject to be less competitive in the market, leaving to leverage the service that provides.

With the advancement of technology and each day more globalization consolidates itself, causing the interaction and integration of persons and services occurs, it is necessary to have more agility of businesses in developing methods, tools and improvements in their processes.

According to Guarnieri et al. (2006), the growing demands of competitiveness in the market ensures that companies adopt methods, ways and more efficient equipment in order to significantly improve their productivity, as well as its quality in services.

In this sense we can say that the logistics, to have a fundamental role contributes in a greater control of the activities of moving and storage, thus facilitating, for an efficient flow of goods, i.e., from the initial loading of materials from a supplier, until the sale of the manufactured product to the final consumer.

The objective of this study was to evaluate the flow of operational activities, noting which steps of the process can be automated with the implementation of equipment that will contribute to a good operational performance, making the process more productive and consequently be reduced cost for the company. Other objectives were also present: performing the literature review based on articles that have similarity with the theme of work; identify the definitions of stock and its management tools and perform the mapping and analysis of the material flow within the distribution center, as well as the analysis of productivity that might be in some of the steps checked.

Thus, this article seeks to assess: how you can enhance the level of service operations; how to automate the process within the operation studied; what steps



within the company need improvements that bring results beneficial to the organization; what the gains that this study will bring to the company and employees involved in the activities evaluated?

With this, it was possible to analyze the importance of equipment that assist in the process of packaging and unitization agreement within the distribution centers, such as differential factor for greater efficiency in processes with increased productivity and cost reduction.

It was the assumption that many companies do not meet in their operational processes the opportunities they have to perform significant improvements from the automation that can result in increased productivity and cost reduction, through a thorough analysis in the steps that make up the operational activities and thereby achieve a better result in the tasks in everyday life, leaving to maximize your level of service.

Thus, the present study is justified by the fact that the companies still do not implement analyzes in their operational processes by evaluating which points of improvements can be implemented from tools that assist the operational processes, to get a better performance in operation managed to maximize profits and minimize costs.

2. RESEARCH METHODOLOGY

It was a qualitative research, literature review in which he also worked with quantitative data. On the approach to the problem is to be classified as a qualitative research.

According to Lima (2001), Mean by qualitative research as the research-focused research whose primary concern is to understand the phenomenon, describing the object of study, interpret their values and relationships, not removing the thought of reality of social actors and where a researcher and researched are subject applicants, and consequently, active in the development of scientific research. As soon as this article seeks to explain, the case based on the phenomena observed.

It was done a case study, because according to Gil (1999) this method assumes that the study of a case study can be representative of many others, or similar cases. The project is deepened in the planning of the stock.



3. THEORETICAL FUNDATION

3.1. Logistics: Some Concepts

The logistics has a fundamental role in relation to the processes of warehousing and distribution of goods from the supplier to the end customer, always seeking to maximize profits and minimize costs; below we have the concept and definitions of author's experts in the area.

The concept of logistics for Ching (2006) consists in performing the function of responding across the movement of materials within the internal and external environment of the company, starting with the arrival of raw materials to the delivery of the final product to the customer.

According to Bowersox and Closs (2010), the logistics involves managing the order processing, inventory, and combination of storage, material handling and packaging all delivered by a network of facilities.

Your goal is to support the operational needs of supply, manufacturing and customer service in the supply chain. In order to manage the resources so that they can be used in the best way possible, with the aim of meeting the needs.

As for Martins and Campos (2010), the logistics is responsible for planning, operation and control of the flow of goods and information from the source supplier to the customer.

Thus, within the modern business, the reason for logistics activity is to achieve the satisfaction of its consumers

According to Carvalho (2002), defines itself as a logistics supply chain management planning and program flow of storage efficient and economical materials, semi-finished and finished products as well as the data generated to them, from the origin to the final destination in order to meet the expectations of our customers.

According to the authors cited above, we can identify who within the logistics segment the main area of the management of resources is the stock.



As cited by the authors the logistics plays a fundamental role in the days of today in the process of distribution of goods, being responsible for planning, organizing and carrying out the most diverse processes in this chain of relationships between customers and final customer.

3.2. Distribution Centers

To ensure that the process of warehousing and distribution of goods occur businesses require that these materials are properly stored in distribution centers that are fundamental for the sending of the most varied products.

The physical distribution of products is one of the logistical challenges, so the choice of the location and function of storage facilities is a differential, and all the processes that promote an efficient flow of materials and finished products are part of an integrated set of decision-making (RODRIGUES; PIZZOLATO, 2003).

Figure 1 shows the relationship that is established between the distribution center as the primary intermediary of suppliers and final customer, making this bridge of connection for the sending of goods:

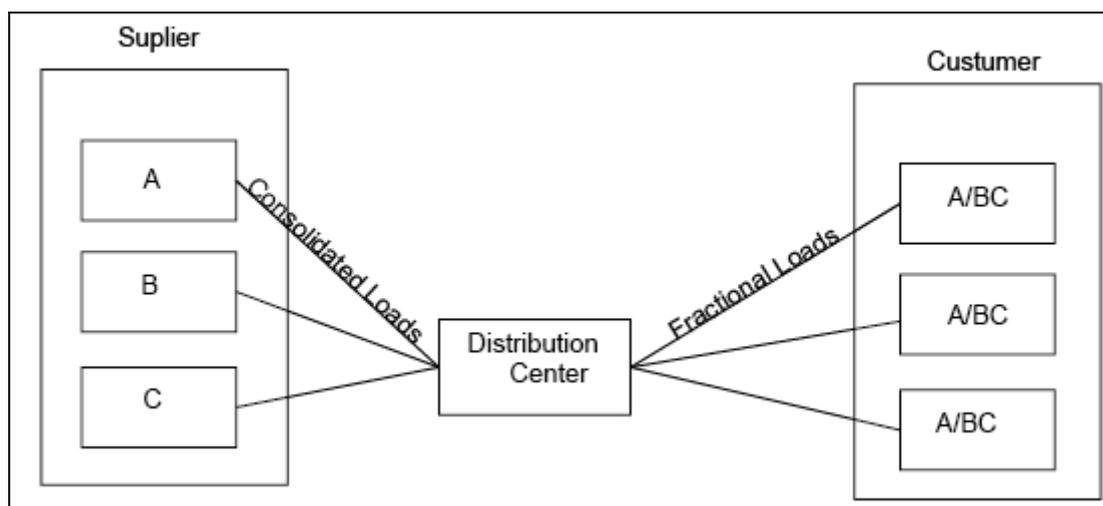


Figure 1: Distribution Center.
 Source: Adapted from Bowersox and Closs (2010)

As the authors cited, the Distribution Center has functions of extreme importance in the logistics process, from the location in which it will be implemented as your operational processes, which are run efficiently bring breathtaking results throughout the chain.

3.3. Functions of a Distribution Center

The distribution center has a role and essential functions within the logistics chain, as the authors:

Rodrigues and Pizzolato apud Calazans (2003) stated that the main functions of a Distribution Center are:

- Receipt;
- Movement of goods;
- Storage;
- Separation of requests;
- Despatcher.

The Figure 2 illustrates the steps described above:

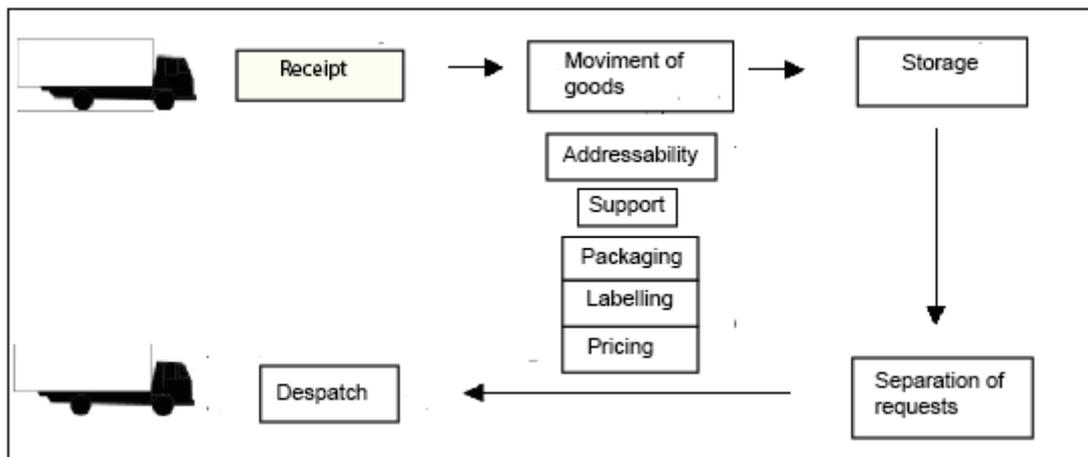


Figure 2: Functions of a Distribution Center.
Source: Adapted from Rodrigues and Pizzolato (2003)

The Figure 2 is intended to demonstrate the functions that are established within the operating process in the Distribution Center, from receipt through to dispatch and at all stages, have particular tasks that are detailed in the course of the study.

3.4. Layout (Physical Arrangement)

In any warehouse or distribution center, makes it necessary a layout very well defined for the processes and stages of operation can function properly.

The physical arrangement is the physical layout of equipment, materials and people in the most appropriate manner to the process, meaning the placement of elements involved to provide a better operational performance. The layout influences

the distribution and location of components in a work environment, and to achieve the perfection you need planning, the layout has to exist (VIANA, 2012).

The author also stresses that the goals of the layout in a warehouse must be:

- Maximize the use of space;
- Provide a movement of materials more efficient;
- Provide a storage more economical, in relation to the cost of space, damage to materials, and labor time of the warehouse and wear of material handling.

In addition, the layout projection consists in only five steps that are necessary to define:

- The location of all obstacles;
- Which are the areas of shipping and receiving;
- What will be the storage areas and separation of requests;
- The location of stock.

To Rodrigues (2009) the operational layout refers to the physical arrangement that is premised on increasing the accessibility of materials and the traffic flows of material handling, and affirms that a layout well planned brings advantages such as:

- Simplifying the handling;
- Rationalizes both the use of the storage area for the use of the labor force;
- Maximizes uptime of equipment handling, which can reduce the amount of faults in the materials.
- The author also points out that to have a good layout should be taken into consideration:
 - The location, measures and amount of docks, which are the places intended for shipment and unloading of vehicles;
 - The width and layout of streets that are longitudinal corridors and sleepers that are transverse corridors;
 - The volumetric capacity, extent and location of the square, which is the total area of the warehouse for the stacking of materials;

- The volumetric capacity, extent and location reserved for greater security of materials of high benefit.

It is difficult to establish generalizations regarding the physical arrangement, because he will have to meet the different needs of each tank, in order to facilitate the movement of materials (BOWERSOX; CLOSS, 2010)

Within the operations analysis of the spaces for a good definition of layout it is necessary because according to the authors, it is imperative that there is a plan to prepare a good layout, making it an extremely competitive.

3.5. Packaging and Unitization

For a productivity gain of the packing process and unitization of products, it is not only necessary, but should be executed in the best way for a good operational performance.

According to the SECEX (2003), Secretary of Foreign Trade, describes the unitization agreement as being the grouping of one or more items of general cargo to be transported as a single unit and indivisible. The unitization agreement does not constitute packaging, and has the purpose of facilitating the handling, handling, storage and transportation of goods. The advantages of unitizations most often is related to the optimization of time and cost reduction, the main ones being:

- Reduction of faults and theft of goods;
- Encouraging the implementation of the system door-to-door;
- Optimizing the operating time of loading and unloading;
- International Standardization of recipients of unitization agreement;
- Reducing the number of volumes to manipulate;
- Reducing the cost of loading and unloading;
- Cost reduction with packaging.

As stated before, you can reduce the cost of packaging with the unitization agreement, but bearing in mind that the logistics involves a correct relationship between packaging and modal, some considerations on packaging are fundamental.



SECEX emphasizes that as the load is often exposed to physical damage, and the characteristics of resistance, size and configuration of materials that involve, determine the necessary equipment for your drive.

A concept proposed by Moura and Banzato (2000) defines packaging:

Set of arts, sciences and techniques used in the preparation of the goods, with the objective of creating the best conditions for transport, storage, distribution, sale and consumption, or alternatively, a means of ensuring the delivery of a product in a reasonable condition at the lowest overall cost (2000, p.11).

According to the authors the packing process and unitization of the products is a primary factor for the accommodation, handling and storage of products.

For the choice of a package, one must take consideration on the type of material and its quantity must be accurate. The greatest damage to products occur when handled, apart from rail transport, therefore the packaging must meet with excellence beyond the protection, an interaction between product and customer (VIANA, 2009).

Material handling is nothing more than transport over short distances that usually occurs in various organizations, this procedure can be applied in loading and unloading of various operations with vehicles, containers, containers and others (VIANA, 2009).

According to the author reveals some objectives of the package as shown in Figure 3:

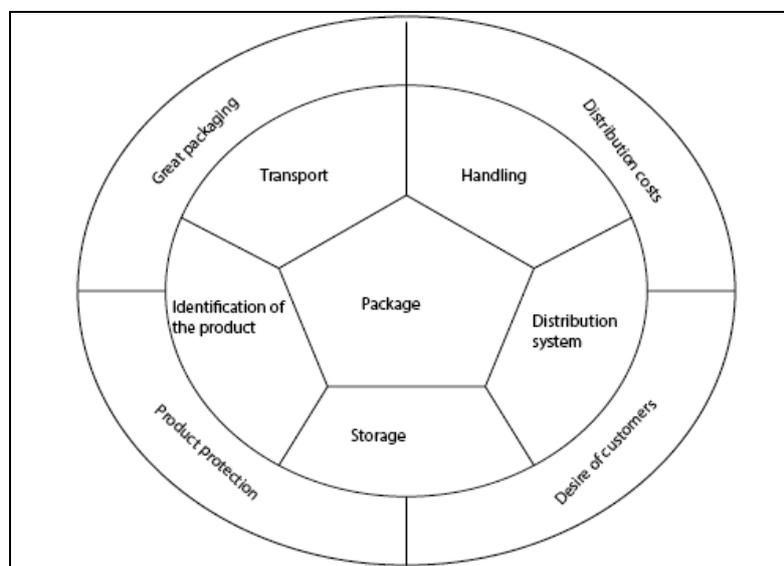


Figure 3: Goals and interaction of packaging in logistics system.

Source: Adapted from Viana (2009)

The participation of the pallets in the unitization agreement is fundamental; Viana (2009) defines it as:

A platform arranged horizontally to loading, consisting of beams, blocks or simple face on supports, whose height is compatible with the introduction of forks of forklift, pallet jack and other systems, and enables the arrangement and the grouping of materials, allowing the handling, storing, handling and transport in a single charge.

The author also highlights the following advantages in the use of pallets as a form of unitization agreement:

- Best use of space in storage, and a vertical, by stacking if possible;
- Reduction of labor in the material handling, resulting in cost savings of handling and time spent;
- Compatible with all modes of transport, such as maritime, land and air transport;
- Possibility to be handled by an extensive amount of material handling;
- Allows a uniform provision of stock, which reduces the obstruction in the courtyards and corridors of the warehouse.
- The author also points out the difficulties that can occur with the use of pallets:
- Use of packaging not standardized, in other words, of various sizes;
- Restricted weight according to the types of material;
- Because they are usually made of wood, have a short life, because the attack of plagues.

In the unitization are typically used packs of plastic film, called stretch-wrap, whose goal is to stabilize the load. The systems of packaging in plastic film when operated automatically decrease labor cost. (BOWERSOX; CLOSS, 2015). The load is involved in a plastic film stretched, resulting in a single load, packaged under pressure (PAOLESCHI, 2010).

3.6. Material Handling

Material handling is concentrated in deposits, and in recent years has been recommended some considerations to guide the material-handling system, according to Bowersox and Closs (2010) they are:



- Investments must be made in handling equipment's, preferably the static equipment like shelves;
- The handling equipment's should be the more standard possible;
- The handling equipment's should be used in the most intensely as possible;
- The system should be designed to provide a flow of products more seamless as possible.

The authors explain that mechanized systems offer a wide variety of material handling equipment; the most common are forklifts, pallet jacks, trailer cables, vehicles for towing, conveyor belts and roundabouts

Forklifts: This is a vehicle for lifting loads by forks, motorized and recommended to operate in medium distances in terms of industrial layout. The operation of this vehicle is simple; the forks collect the pallets through the devices of their own basis for handling, and by elevation run, the activity of stack and these characteristics make it one of the most versatile handling. The models may vary according to the characteristics or requirements of the materials, but in general are divided into three classes: the front of counter-arrested, front that balances the load within its own base and sides (DIAS, 2009).

Pallet Jacks: Equipment of low cost and high efficiency for the movement of materials, its normal operation covers the loading and unloading, separation of requests, and handling of small loads at greater distances within the warehouse, your power supply can be the electricity for the electric pallet jacks, and can also be manual labor for manual pallet jacks (BOWERSOX; CLOSS, 2010).

Trailer Cables: Are devices of drag, stretched on the ground or installed in structures carriers, their advantage is the continuous movement, however does not have the versatility of forklifts, and are usually used in the separation of applications.

Vehicles for Towing: This is a tow vehicle that consists of a tractor unit towing skip hoists, its advantage is the flexibility, however is not as economically efficient as the cables of trailer because they need to be operated by a driver, which is sometimes idle.

Conveyor Belt: Are basic equipment of many systems of separation applications, where according to your type of actuation can be accomplished by gravity or electricity, with movements of rollers or belts

Roundabouts: Unlike most of the equipment, the roundabouts are devices that deliver the desired items to the request through a series of containers arranged in a pattern oval, its advantage is the reduction of labor used in separation (BOWERSOX; CLOSS, 2010).

The investment in equipment that offer automation, become attractive by consuming less the workforce directly and are faster and more accurate, considering that its only weak point is that it needs a high investment cost.

3.7. Logistics Productivity

The relationship between resources used as labor and time of forklifts and the volume of output of an operation as a loading or unloading from a truck are what define productivity logistics. All logistical operations are affected by the packaging, as for example the productivity of separation applications, use of space available in the warehouse, on the loading of a vehicle and even in the carriage. The amount of volume or packages are loaded or discharged per hour and the quantity area per hour in a warehouse or distribution center are factors expressed by almost all indicators of productivity of logistics operations (BOWERSOX; CLOSS, 2010).

Currently in Brazil, the management of productivity in companies is becoming an issue increasingly applicant, in order that the business scenario is under the influence of strong globalization, businesses that do not have productivity or efficiency in the productive process will hardly succeed or even survive. This concept also tends to emphasize the importance of tangible resources such as equipment and machinery, quantity of raw materials and labor, and in a manner consistent can be identified by analyzes the factors that constitute the bottlenecks in productivity, thus to eliminate them (MACEDO, 2012).

3.8. Stock: Definitions

The stock within enterprises has the premise of being responsible for allocating the goods, thus we see as the authors:



Stock is a current asset that should offer return on invested capital. The return on investment in stock is the marginal profit on sales that would not happen without the stock (BOWERSOX, 2007).

Stock is the composition of materials warehouse, which is not used in any given moment in the company, but that must exist in the light of future needs. This means that both for the production process and provision of service always existed a stock whether it is large, medium or small (CHIAVENATO, 2005).

According to Ballou (2006), stock are the sum of raw materials, supplies, components, in-process materials and finished products that appear in many points of the channel of production and logistics companies.

Noticing that the stock is used for several purposes such as:

- Best level of service;
- Encourage economies in production;
- Scale economies in the acquisition of transport;
- Protects against the price increase;
- Serves as a contingency plan to increase the price.

3.9. Function of the Stock

Based on Chiavenato (2005), the main functions of the stock of inventory are:

- Ensure the supply of materials businesses;
- Neutralize the effects of delay or delay in the supply of materials;
- Provide economies of scale through the purchase with lots rentals;
- The flexibility of the productive process;
- Speed and efficiency in serving the needs.

3.10. Tools that Help the Inventory Management

To have a good inventory management should evaluate what are the main tools and systems that assist in this process, in this topic we will cover what are these tools and how they can bring significant results for establishing a process efficiently and effectively, seeking the best performance of services rendered.

3.11. Inventory

The inventory is a tool for the identification, classification and counting of products which are in stock. To do this requires planning and control of inventory is essential in any business for a good result in its processes (DAY, 1997).

According to Melo (2013) the inventory is one of the tools of administration of inventories, which consist in processes of counting, understands the count of all materials that have in deposits or warehouse of a company and later confrontation with the accounting balances. It is a check on the systems of storage, which aims to identify differences that are caused by various problems as failures in the handling, loss, theft and loss, where your goals are to raise the status of inventory and audit to understand the situation of same and the procedures developed in storage.

The author describes the inventory according to three criteria: amplitude, frequency and form of execution:

As to the amplitude, it has:

- General: the process considers all materials from stock;
- Partial: it considers only certain materials present in stock;
- Specific: When some divergence physicist accounting arises, is held a count to make adjustments.
- In relation to frequency of counting has:
 - Periodical: Done at predetermined intervals determined, for example, when the company performs the closing of half-yearly balance sheets or annual basis. It is held a general count;
 - Beacon or cyclic: conducted in defined periods for certain materials previously chosen for that, when it reaches a certain period, all items have been counted.

As to the form of execution has:

- Closed doors: it is vetoed the entry and exit of material;
- Semi – closed Doors: The entry of certain groups items is closed, releasing for the rest;

- Doors open: The physical count is performed simultaneously with the movement of the area.

3.12. ABC Curve

The ABC curve, as Chiavenato (2005), also known as turn of Pareto is based on the principle that a greater share of investment in materials within the company is concentrated in a small number of items.

According to Dias (1997), organizations are looking for tools that can facilitate the activities for their employees, customers in a shortest possible time optimizing the flow of products upon receipt, storage, sorting and loading, the classification ABC or curve of Pareto is essential in this process, since separates the items by classes according to their importance within the stock from its value or move.

After this classification, companies are adopting greater attention to items of classes A, since their monetary values are higher. Already the items of Class B receive a smaller attention and the items of class C, which is treated by means, semi-automatic, because you do not need to control very accurate (DIAS, 1997).

It can be said that through the ABC curve, it is possible to check the level of attention that each item deserves or needs to have available to satisfy the customer.

3.13. Just in Time

According to Benato et. al. (2009), Just In Time aim the demand, with the maximum possible quality, without waste, making the connection between supply and demand when necessary, i.e., deliver goods and services at the necessary time, not before not to turn into stock, and not afterwards so that customers have to separate.

Figure 4 illustrates how the system just in time works:

Benato et.al. (2009), defines the objective of Just in Time as a system to supply products for production and customers when needed, in which it is a system that aims to the stock zero, proposes that the company plan, therefore, the customer will be the point of pulled of requests, because it is only going to produce what you sell, thus producing in excess.

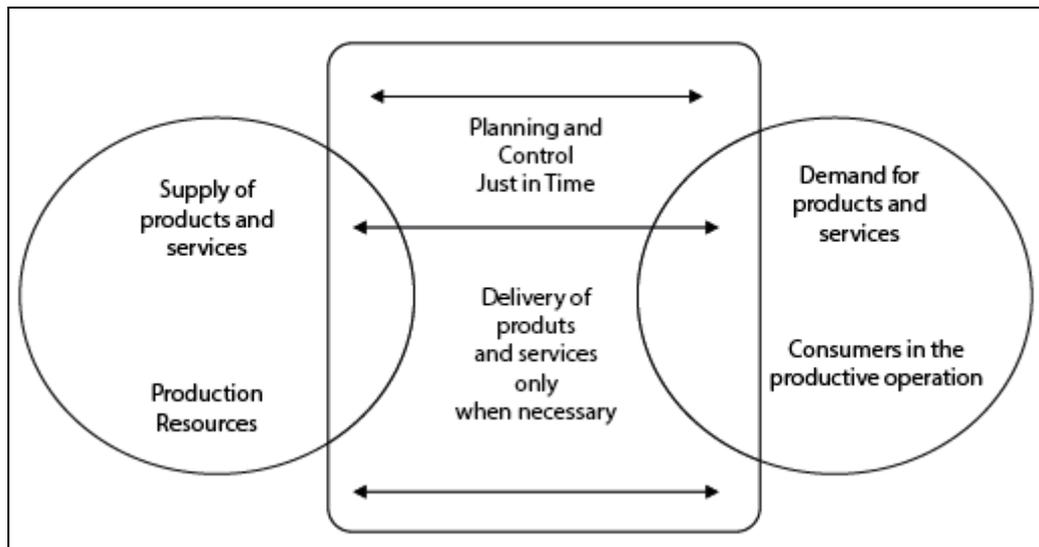


Figure 4: Just In Time.
Source: Benato et al. (2009)

3.14. The FIFO Methodology

First in, first out, is the assessment made by order of the entries. To start out the material that came first in the stock, being replaced by the same chronological order in which it was received.

Both companies that have their input of products continuously and orderly manner and for companies that have a high turnover of stock, ranging product costs (ANDRADE; SCHRAMM; SILVA, 2014), mainly use this type of assessment method.

The same authors also point out that for a smooth functioning of the method, operators of parts should perform a caster, putting the existing materials in front of the materials that have recently entered, to facilitate their handling and control. Highlight the following advantages of this method

- The items used are taken from the stock and the low is given in controls in a logical and systematic manner;
- The results reflect the actual cost of the items used in the output;

The movement has been established for the materials, continuously and orderly, represents a necessary condition for the perfect control of materials, especially when these are subject to deterioration, decay, changes in quality.

3.15. Mapping and Review of Operational Flow

A stock management should be efficient to meet the needs of customers, for that to happen, operations must be defined in order to make it clearer understanding the process and thus allow for improvements in processes.

The stock management requires the use of some techniques or methods to assist in decision-making, and within a vision from management, these methods are of utmost importance for entrepreneurs, because with an accurate sense of the existing costs in your stock and the value of your merchandise you can obtain orders of entrances and exits and know which products are more profitable and their respective periods of purchase ideas (LOPES et.al, 2014).

The flow of materials is composed of a series of operation; they are receiving, handling, storage, picking and separation, shipping and inventory. Following this line of reasoning the receiving process will be responsible for the qualitative and quantitative analysis and labeling; the movement will be responsible for the transition from receipt to the warehouse in accordance with the labelling held; the storage will perform as presenting these materials, which should be organized in the most efficient way to facilitate the next step.

Picking and separation consists in the consolidation of various materials in an application, and can be carried out by equipment or by handling with employees; following to the dispatch where all the necessary documentation is issued, a final conference of the request to ensure that it is delivered without breakage and finishes with the inventory, where all items are numbered to identify possible losses and have greater accuracy of information for issuing statements of result for its analysis (VERÍSSIMO; MUSSETI, 2003).

4. CASE STUDY

4.1. Knowing the Company

The case study was conducted in a logistics operator, a global leader in logistics, which offers customized solutions for various industry sectors. In the United States is the only logistics operator that integrates the supply chain seeking operational excellence for the satisfaction of its customers.

The company not only acts as a service provider, but also as a responsible corporate citizen and compromised with the environment and social projects with a sustainability policy, very well defined, conscious of its role together with the



environment and support the society with jobs and internal campaigns and volunteering.

The study was done in one of the customers whose operator provides service, which is responsible for the distribution of equipment and solutions in the print line, making the control and management of documents, with specialized teams and properly prepared for small medium and large businesses and resellers authorized distributed throughout the national territory.

With equipment and specialized solutions for each area, this customer has technical structure itself operating, having as a challenge to establish the standard of excellence in technology at the service of society.

In addition to the equipment another line of product and services that they have are the lines of consumption: authorized distributors sell digital cameras, camcorders and inkjet printers.

4.2. The Data Collection Instrument

The data collection was carried out from the direct observation, in which we evaluated the steps in the process of operation from the entrance to the process of dispatch, passing by the activity of inventory, thereby identifying the functionality of each stage, as well as the volume of work within the study period and amount of resource to meet this demand.

According to Mentzer et.al. (2001), sorts the whole process with beginning middle and end, defining the process as a set of job activity in a particular time and place, and through structures (flows), seeks to standardize the steps of activities, and thus obtain better performance for which there is no breakage.

From this principle was developed the flow below for the process of direct observation:



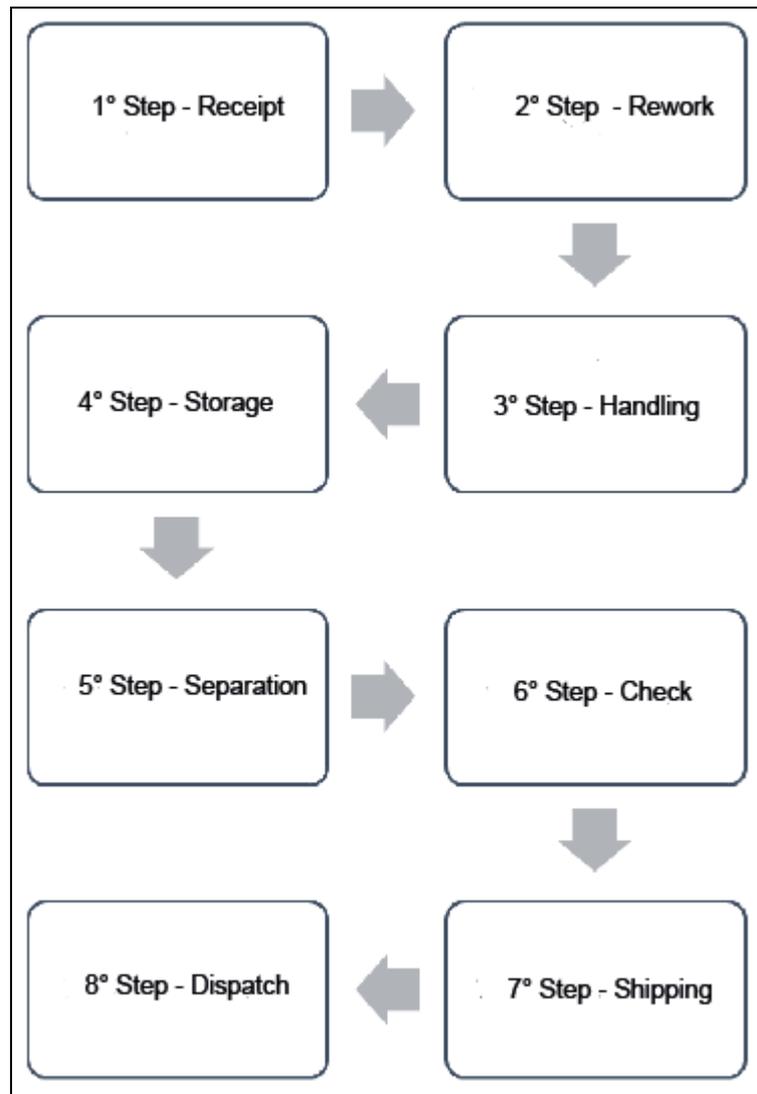


Figure 5: Flow to process mapping.
Source: Own researchers (2016)

The purpose of this mapping is to bring a perfect understanding of operational processes in order to obtain a thorough overview of each step of the flow.

With the flow to the operational mapping was developed a framework for analysis of the processes, identifying what the media profile, number of people, quantities of pieces, quantity of pallets, where these components are the labor involved in the process and the demand of each activity within the period evaluated, as can be seen in Figure 6:

| Item | Activity Description | Product Type | Qtd. Person | Qtd. Pieces | Qtd. Pallets | Average Pieces | Average Pieces |
|-----------|----------------------|----------------|-------------|-------------|--------------|----------------|----------------|
| <u>1-</u> | Receipt | Supply/ Equip. | | | | | |
| <u>2-</u> | Rework | Supply/ Equip. | | | | | |
| <u>3-</u> | Handling | Supply/ Equip. | | | | | |
| <u>4-</u> | Storage | Supply/ Equip. | | | | | |
| <u>5-</u> | Separation | Supply/ Equip. | | | | | |
| <u>6-</u> | Check | Supply/ Equip. | | | | | |
| <u>7-</u> | Shipping | Supply/ Equip. | | | | | |
| <u>8-</u> | Dispatch | Supply/ Equip. | | | | | |

Figure 6: Process Analysis.
 Source: Own researchers (2016)

4.3. The Data Collection Process

It was held to visit the company within the sector of study for the data collection process by means of direct observation, where he evaluated all processes of the operation.

The process of observation was carried out from the mapping of the flow that was defined, in which the steps to be followed by the data collection instrument developed helped in understanding and understanding of each sector.

Below a description of how you performed each step:

1° Step - The initial activity of operation consists in the receiving process, where it occurs frequently, all days with varied volume of merchandise from the information passed by the client, not the control by the service provider as to what will be delivered, what if down is scheduled from customer information after the purchase of products made by him;

2° Step – Following to the second step we have the process of reworking of materials, which after received is available in the staged for it to be carried out the process of beating of goods, where the materials are grouped according to their specifications, is subsequently performed the labelling of products and finally the process to stretch the pallets to offers them for storage

3° Step - The third step in the process is the movement of goods to the storage area, where the materials are intended to stock to be stored by employees as the standard of goods;

4° Step - The fourth step consists in storing the products in accordance with the profile of storage they have, for items that are placed in positions of the process is carried out by employees with the use only of manual pallet jack, since the products of the rack the process is carried out by operators of forklift, in accordance with the quantity to be stored items are grouped with other materials that are already covered in stock;

5° Step - Now the fifth step in the process is the separation, an activity that occurs through a pick-list, which contains the location information that the item is stored, item to be separated and quantities of parts that the employee should separate, after finalized the separation materials are arranged on pallets in the check area;

6° Step - The sixth step is the check process, where employees faced the separation that was performed with data from the pick-list, making the clanking of items and quantities of parts that was separated, after this process closes the volumes that have been generated, after the conference is the materials for the staged for shipment;

7° Step - The seventh step is to dispatch, a process which consists in the separation of applications conferred according to the volumes outlined by the



lecturer, the separation of materials occurs by romaneio of dispatch that is generated in accordance with the carrier specifies that there is no request after billing invoice number;

8° Step - The eighth step assessed was the activity of inventory, which consists in counting the items listed in stock, making the clanking of physical and system, the count and done on a cyclical basis (daily), which should be counted all stock within the month, for completion of this activity is necessary to the use of lifting platform for the count of sites of structure and for the positions of floor uses a manual pallet jack

5. ANALYSIS OF RESULTS

This section will be presented the analysis of the results obtained after data collection have been performed through mapping done and the application of the instrument of collected data from developed.

5.1. Results Obtained

From the observation was possible to obtain familiarity with the operational activities by identifying the role of each step and the performance of each employee and equipment for these processes to be carried out, making them increasingly agile bringing better performance for operation.

It was observed each step in process mapping. It is observed in the data collection instrument duly filled in with the information on the quantity of resources used to make each one of them and the volume of parts and pallet assessed during the period of one week.

| Item | Descrição da Atividade | Tipo de Produto | Qtd. Person | Qtd. Pieces | Qtd. Pallets | Average Pieces | Average Pallets |
|------|------------------------|-----------------|-------------|-------------|--------------|----------------|-----------------|
| 1- | Receipt | Supply/ Equip. | 2 | 7460 | 96 | 1492 | 19,2 |
| 2- | Rework | Supply/ Equip. | 2 | 7460 | 96 | 1492 | 19,2 |
| 3- | Handling | Supply/ Equip. | 2 | 7460 | 188 | 1492 | 37,6 |
| 4- | Storage | Supply/ Equip. | 2 | 7460 | 155 | 1492 | 31 |
| 5- | Separation | Supply/ Equip. | 3 | 7200 | 172 | 1440 | 34,4 |
| 6- | Check | Supply/ Equip. | 2 | 7200 | 77 | 1440 | 15,4 |
| 7- | Dispatch | Supply/ Equip. | 2 | 5480 | 66 | 1096 | 13,2 |
| 8- | Inventory | Supply/ Equip. | 1 | 10500 | 320 | 2100 | 64 |

Figure 7: Process Analysis Completed.
 Source: Own researchers (2016)

1° Step – Receipt - Activity performed by 2 employees of receipt, that within the period assessed 1 week, there was the receipt of 7460 pieces, for a total of 96 pallets delivered in cases of import and purchase national, with an average of 1492 pieces and 19 pallets.

2° Step – Reworking of Materials – Activity performed by 2 employees, where did the reworking of the 7460 parts and 96 pallets received, with an average of 1492 parts and 19 pallets.

3° Step – Movement of goods to the storage area - Activity performed by 2 employees and also by employees of receipt in synergy, which performed the reworking of the 7460 pieces received, however due to the reworking of materials the quantity of pallets has increased going for 188 pallets, due to consolidation of items and accommodation in an appropriate way of products for the storage of materials, with this the average pieces remained in 1492, but the pallet was 37.6 for pallets.

4° Step – Storage - The activity was carried out by the 2 lecturers together with 2 forklift operators, where they stored 7460 pieces, but the number of stored pallets reduced from 188 to 155, since some items on the pallets were already in stock, so it was grouped with Which was entered, causing the average in pieces to remain me 1492 pieces and the average pallet was for 31 pallets.

5° Step – Separation - Activity carried out by 3 separators that during the evaluated period carried out the separation of 7200 pieces, having moved between pallets stored in structure and floor spaces 172 pallets, with an average of 1440 pieces and 34.4 pallets.

6° Step – Conference - This activity was carried out by 2 lecturers, where they carried out the conference of the separated materials in the total of 7200 pieces, which with the consolidation of the separated pieces resulted in the total of 77 pallets, with an average of 1440 pieces and 15.4 pallets.

7° Step – Expedition - Activity carried out by 2 dock lecturers, in which 5480 pieces were dispatched, totaling 66 pallets, with an average of 1096 pieces and 13.2 pallets.

8° Step – Inventory - Activity carried out by 1 inventory assistant, who during the period counted 10500 pieces, a total of 320 pallets, these being of structure and place of floor, with an average of 2100 pieces and 64 pallets.

In the evaluation of the processes of operation found that 100% of them for handling and use of pallets, being 87% of the steps required to use stretch to the movement, accommodation of merchandise and store of materials occurs.

Currently, employees of the operation in steps perform the process manually: 1 - Receiving, 2 - Rework, 3 – Handling to Storage Area, 4 - Storage, 5 - Separation, 7 - dispatch and 8 - Inventory.

To perform these processes beyond the time spent for the execution, other factors were analyzed in observation, which are the wear of the collaborator, ergonomics and the lack of pattern in the service performed, once implemented by various people and with a factor of fatigue contributor the result after I finish the process is not uniform, and variations in the final result.

Starting from the principle of observation and analysis of the results of the feasibility of automating the process, would be of great benefit to the operation, because would bring productivity gains, reducing the time spent, contributing significantly to the quality of service and performance of employees.

The suggestion of the researchers is the automation from the implementation of a stretch in the sector, which would firm in its level of service that is made more effective and contributing to the performance of employees involved in the process.

Figures and tables must be included in the main text and, individually, numbered and captioned with a brief title. They must be black and white with minimum shading and numbered consecutively using Arabic numerals. Captions should be put below figures and above tables. Leave one line before (tables) and after (figures).

6. FINAL CONSIDERATIONS

This article aimed to verify from the analysis of the operational processes improvement opportunities, in which the company may be evaluating how to become more efficient in their sector.

Perform this observation in the processes of the operation brings great significant results, because the familiarity with the process results in a critical observation, showing the real situation in which employees are inserted.

They were completed all the objectives proposed in this study, in which we had as a challenge to identify, within the activities of the operation, what could be improved from the automation of some stage, which would contribute to the company and its employees. It was possible to achieve these goals, by means of a survey of the theoretical framework, in which the authors studied contributed to the direction that article had.

A great challenge we had was to have a perception of what would or can improve the company in which contributes in a satisfactory manner the organization and its employees.

The suggestion of researchers is automating the process through the implementation of a shoe that wrap the pallets automatically with the plastic film



streich, which would help the company in its level of service and quality of work of employees who will directly reflect on your performance.

For a forthcoming research and continuity of work, it would be a relevant market analysis of equipment, identifying its viability economically, making a comparison of the real situation in the company and the simulation with the implementation of the equipment of strech.

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