Implementation of a Model of Inventories in Five Mipymes in the City of Neiva, Republic of Colombia

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Abstract

Bearing in mind that most of the productive units in the country correspond to Mipymes and the contribution they are making to the economy. It is necessary to know some series of situations related to their administrative management that, due to lack of knowledge, resources, the same business culture, make them are uncompetitive and productive in an environment in which every day there are major challenges. One of the aspects that affect them, has to do with the handling of inventories, this to the extent that many of the Mipymes do not have an inventory management system that allows them to make efficient use of resources. Precisely this was proven during the development of the applied research instruments, which included the implementation of the ABC Inventory Management Model, where the companies have low rotation products in their inventories, which leads to a series of unnecessary costs and that undoubtedly affects your finances. All this leads to the idea of working on the implementation of an inventory management model according to the needs of Mipymes For this, it is necessary to know the way in which the inventories are handled, for such case from the development of the survey and the five selected MSMEs. The second is to identify the shortcomings of the inventories studied, and the third to determine the inventory model to be used and to implement it in Mipymes.

Keyword: Inventory, Optimization, Simulation, Implementation

INTRODUCTION

The level of customer service and the minimum stock of inventories are general policies for the optimization of inventories and are in turn indicators in the administrative management of an organization; the great difficulty present in the fulfillment of these two managerial indicators is the total ignorance of the behavior of demand and poor forecasting in the medium term. Consequently, there are high levels of inventories that generate unnecessary costs, decomposition of them and inability to respond to the needs of the consumer.

Keeping in mind that inventory management is a process designed to plan, manage and control the resources available within the organization, thus allowing the proper management of them, this inventory management system must specify when the order will be placed of an article and how many units will be ordered; therefore, inventory control is a critical aspect of successful management.

Therefore, faced with the problems identified in this research, it is decided to work on the management of inventories carried out by MSMEs in the city of Neiva. That is why this research, apart from the identification of the problem, justification and objectives, makes a conceptualization of the topic. Likewise, a methodological design is presented, followed by the application of some instruments, whose results are analyzed. Here we also present the discussion of the results and conclusions.

It is worth bearing in mind that, from the development of the research, whose results allow us to make a diagnosis of how MSMEs in the city of Neiva handle their inventions and apply some type of inventory management system. This, analyzing the internal and external processes of the supply chain, from the preparation of the forecast for the issuance of the quantities to order, to the process of distribution of the merchandise; with the objective of identifying opportunities for improvement and defining the policies of the processes of the proposed model.

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METHODOLOGY

Research Design.

The methodological design of the project is descriptive, because the information that is sought has to do with the way in which MSMEs manage the inventory. The characterization, rotation and location of the different products will be discussed from the implementation of the ABC System.

Participants

The population to work includes the MSMEs established in the city of Neiva, which according to the Chamber of Commerce records is 1218 Mipymes. These are classified in different sectors as it is (poultry, hardware store, drugstores, minimarkets and sales of spare parts for motorcycles, dairy).

Sample population

For the selection of the sample, the following considerations were considered: The sample calculation of MSMEs is made to which the survey will be applied.

Table 1. Sample population

Sample calculation	
Trust Level	0.95
Error Range	0.07
Z	1.96
Population Size	1218
Success Chances	0.7
Probabilities of error	0.3
Size of the sample	145

Table 2. Business sector

Sector	CIUU
Retail Pharmacy	G4773
Wholesale Pharmacy	G4645
Retail Hardware	G4663
Wholesale Hardware	G4752
Poultry breeding	A0145
Dairy Trade	G4772
Production of dairy products	C1040
Minimarkets	G4799

For the selection of MSMEs where the Inventory Management model would be applied, the sample calculation was not performed. Five MSMEs were selected for convenience, who during the interview process were interested in participating in the process. Each of these MSMEs belongs to a different sector of the economy.

Techniques and Instruments to be used for the collection of information

For the development of the research, the survey was used as an instrument, in which 15 questions were asked in the form of a funnel, starting from the most general problems to the most specific ones. The Likert scale is used there.

Analysis in Software SPSS.
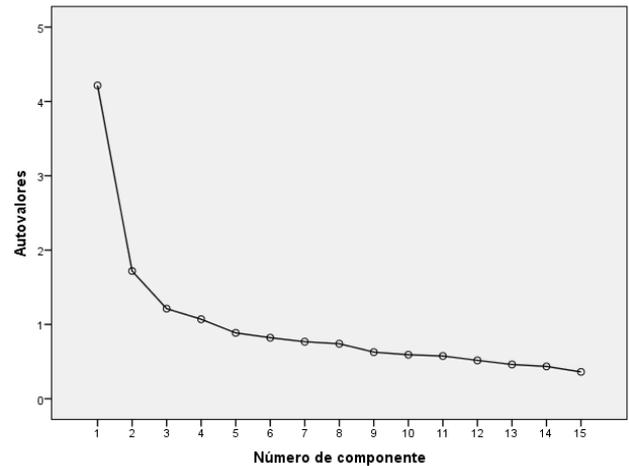
Figure 1. Sedimentation graph in SPSS.

Through an analysis in the SPSS program, it shows initial values, dividing the survey into 4 specific components, giving us to understand that with 4 specific questions we could deduce the real problems of the MSMEs

A sedimentation graph is obtained where we can see that the first four questions are relevant and have to do with the objective to develop the project.

To know the reliability of the surveys, the formula ALFA DE CRONBACH was used. It shows us the reliability of the survey carried out, resulting in 0.811 considering that the closer to 1.0 the survey is more reliable and relevant.

Table 3. Statistics of reliability

| STATISTICS OF RELIABILITY	
ALFA OF CRONBACH	Number of elements
0,811	15

ANALYSIS OF ABC MODEL

In this figure 2, the problem of MSMEs is identified in the city of Neiva, using the ABC method, with excess products in category C, with a percentage of 81.39%, showing that these products have very few sales.
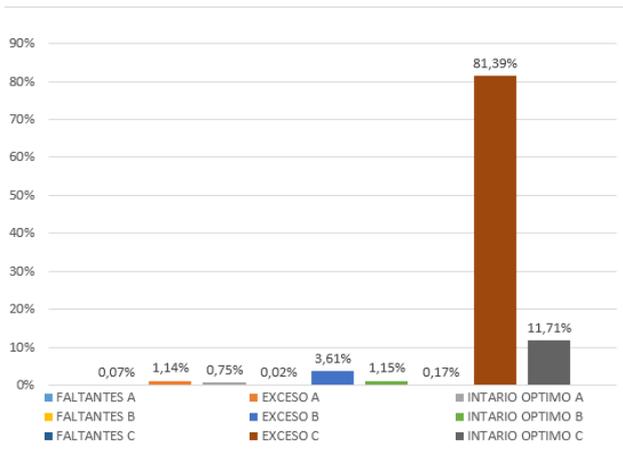
Figure 2. Mipymes with excess products in category C with ABC method.

As a result, in this figure 3, it can be shown that the cost is very high, due to the excesses that exist in products of category C, with a percentage of 93.28% due to the little sales output that these products have at the general in the 5 MSMEs analyzed.
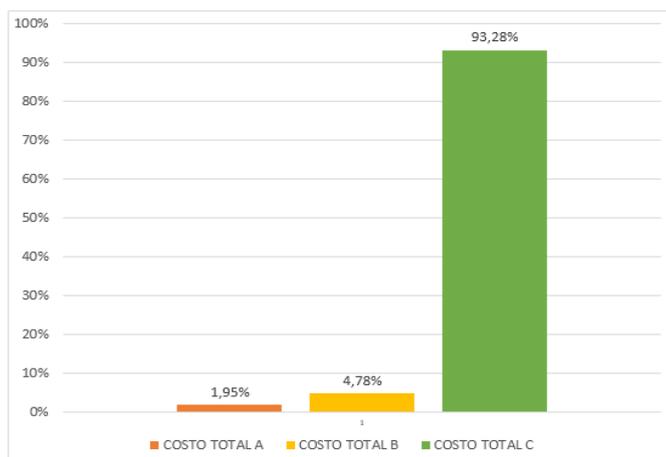

Figure 3. Costs the products with ABC method.

The previous graph shows the imbalance that exists of the three most important costs and that are determinative to have an efficient inventory. In this case, the highest inventory has an excess of products with 86.14% and that logically by making the respective diagnosis in each of the five MSMEs. A total cost of optimal inventory is evidenced with a percentage of 0.26%. This means that at a general level, all the inventories are with excess products, which implies that the losses are significant when the balance between inventory and sales isn't maintained.
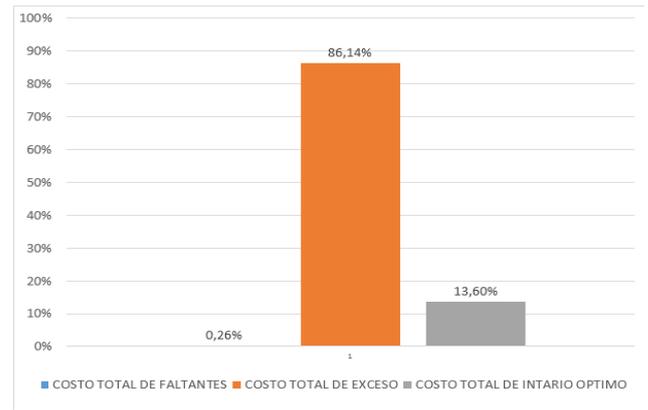

Figure 4. Total Costs the products with ABC method.
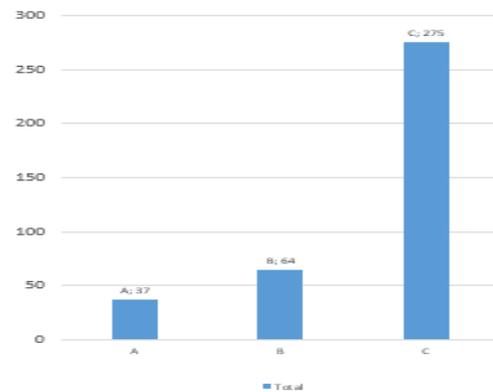
Figure 3. Stock ABC. Number of items by category.

When verifying, the ABC stock for articles or products, is clearly seen taking as an example the drugstore that currently has products A: 37 products, B: 64 products and C: 275 products, this evidences remarkably that, the most significant error is to have low sales and turnover products, therefore the costs increase and there is no balance of inventories, which generates unnecessary costs for the company. It should be noted that there are essential products, that is to say that independent that have little output, must be in inventory, for the satisfaction of the client.

ABC LAW OF UNITS

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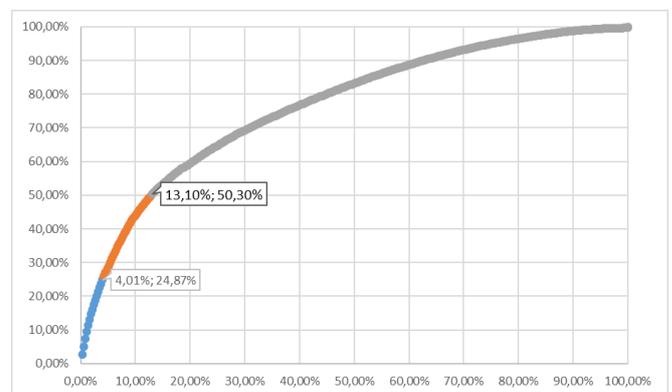
When carrying out this diagnosis, with the ABC method, it can be suggested that with the sales of 4.01%, a total of 24.87% of the MSMEs' profits were obtained, and with sales of 13.10%. 50.30% of the profits are reached. This means that with the sales of the AYB category, 50% of the total profits of the companies are reached, therefore, the issue to be corrected are the excesses of low-sale products and rotation categorized in C, this being the great difficulty presented by the MSMEs.

THEORETICAL FRAMEWORK

Inventory Management System

The management of inventories according to Zapata (2014) is defined as the system that "seeks to keep available the products that are required for the company and for the customers, which implies the coordination of the areas of purchasing, manufacturing, distribution". (p.11-12). This control of inventories has great advantages for companies in terms of efficiency and productivity. Therefore, according to Zapata (2014) the advantage has to do with "The responsibility of serving as a cushion to respond to variations in supply and demand leads companies to maintain inventories, so that the customer is satisfied. "For its part for the SENA (sf): The adequate management of inventories has a positive impact on other areas such as transportation and purchases, in addition to helping to prevent fraud, theft, detect waste and reduce waste. Within the costs incurred by the company to manage inventories, we have storage and acquisition costs. Finally, the proper administration of inventories contributes to generating profits for the company. (p.13).

Therefore, given the importance of inventory control systems, Muñoz (2017) cites Palacio & Adarme (2014) to say, "The business environment took logistics as a flag of competitiveness in the mid-nineties. As this business function is responsible for providing the correct product, the required quantity, in the right conditions, in the right place, in the required time, at a reasonable cost and to the customer's full satisfaction ". In short, an adequate inventory control system depends on the efficiency, competitiveness and success of any organization, regardless of its size.

Inventories

The inventories have to do with the stocks of raw materials, finished products, of a company, with which it develops its economic activity. In this sense, according to Zapata (2014) citing Ballou (2005) "Inventories are accumulations of raw materials, supplies, components, work in process and finished products that appear at numerous points along the production and production channel logistics of a company".

According to Duque, Osorio and Agudelo (2010) cite Carvalho (2009) to refer to inventories as "goods destined for sale or production for subsequent sale. It is such as raw materials, products in process, finished goods and other materials or supplies that are used in the packaging, container of merchandise or spare parts for maintenance that are consumed in the normal cycle of operations."

Types of inventories: According to what was expressed by Duque, Osorio and Agudelo (2010) considering the Colombian regulations divide the inventory into:

- Raw material inventory

- Inventory of products in process

- Inventory of finished products

The need to have these inventories according to the Information Guide of SENA (sf) "supply to protect against uncertainties, facilitate the production and purchase of items with economically advantageous conditions, prevent anticipated changes in demand and supply and finally we have to conserve the transit between the points of production or storage "(page 3).

Mipymes

The Mipymes are defined in Colombia according to the Diner Magazine as "any unit of economic exploitation performed by a natural or legal person, in business, agricultural, industrial, commercial or service activities, rural or urban, responding to two great parameters: number of workers or total assets. "In such case, its classification is given according to law 905 of 204 according to number of employees and total assets.

CLASSIFICATION OF INVENTORIES: ABC METHOD

The inventory classification method is one of the most used methods for classifying inventories. According to Parada (2009) "The ABC analysis, also called curve 80-20, is based on the contribution of the economist Wilfredo Pareto, after a study of the distribution of income" (p.5). Later Parada himself (2009) states that "When the method is applied, a curve is obtained that represents the statistical distribution of the effect of the lines considered, in this curve three zones are defined, whose limits are determined by the ranges that are Assign him. "(p.6).

According to Muñoz (2017) who is cited by Olivos y Penagos (2013) as given the volumes handled in the inventories of the companies, their management can be a bit difficult and expensive. For the same, for these:

Given the large number of references between raw materials, spare parts, product in process and finished product that have to be managed in a control and inventory management system within a company, it is very expensive and impractical to establish monitoring and control schemes in a individual. Instead, the most commonly adopted practice is to add references by family groups and apply equal control policies to the entire group. The form commonly used to make this type of classifications is the so-called ABC classification, which is done independently for raw materials and finished products.

CONCLUSIONS

In the city of Neiva the MSMEs still do not make an adequate management of their inventories, this caused by multiple factors within which are the ignorance, the lack of resources, the thinking that, as well as the company works, things are fine.

One of the biggest consequences of not using an Inventory Management method has to do with an inadequate management of them, especially due to the excess of products with low turnover. This causes unnecessary costs and therefore affects the efficiency, productivity and competitiveness of the company.

It is found that the advantages of using an inventory management method represent for the company a saving of resources, but at the same time the possibility of being competitive within the market, having the possibility of responding to the challenges imposed by the environment, but at the same time the needs of the customers.

It is necessary that MSMEs receive support from the government and other institutions that help them improve their management processes. Well many times these companies due to their size and especially the microenterprises, apart from the lack of resources, the inexperience, the inability to compete in the market, cause them to fail. Do not forget how it looked during the investigation that this type of companies contributes greatly to the generation of employment in the country.

An inventory model improves the fundamental problems of the current system of stock-outs and breakage of inventories, so that purchase orders and merchandise distribution can be defined correctly, considering the type of process of the Mipyme.

The planning of the proposed model established in managing the processes of issuing purchase orders and distribution of the merchandise according to the requirements of the consumer warehouses, guarantees the commercialization of the merchandise, and consequently the ideal flow of the products by the supply chain, improving the operational performance of the company

When making the analysis to choose the best inventory model, several important aspects must be considered, such as the type of raw material handled, whether they are perishable, how often orders are placed and how is the sales flow. The standards indicated will allow your work not only to stand out for its content, but also to be visually appealing.

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