Inventory Management In Companies Of The Pecém Port Complex: Challenges And Opportunities

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Abstract:

Background: Inventory management is a relevant topic for companies as it can directly impact costs and the quality of services provided. In this context, this paper addresses an inventory management model in an industry within the Industrial and Port Complex of Pecém (CIPP).

Materials and Methods: A mixed-methods research approach was employed, utilizing a literature review and a questionnaire created in Microsoft Forms. The questionnaire was administered to 38 workers involved in the researched theme between August and October 2023. The objective was to analyze inventory management practices in the context of the Industrial and Port Complex of Pecém (CIPP) and to capture the workers' perspectives on satisfaction, issues, and associated indicators. The primary aim of this study is to analyze and comprehend the best inventory management practices applied in the CIPP.

Results: The findings indicate challenges to be overcome, such as a lack of planning in inventory management. They also reveal that a lack of knowledge about inventory management process indicators can lead to inappropriate and ineffective decision-making. Therefore, it is crucial for professionals to be adequately informed and trained in the interpretation and application of process indicators to ensure operational effectiveness and the achievement of the organization's strategic objectives.

Conclusion: The research highlights that standardizing the activities of inventory managers, based on accurate data and analyses, emerges as a key element for balancing excess and shortage of inventory. Creative solutions, such as an inventory management handbook, can be adopted to achieve this objective. Furthermore, the application of tools like ABC classification and material segmentation is essential to optimize inventory levels and align costs with the desired service level.

Keywords: Inventory Management; Costs; Best Management Practices; Standardization; Inventory Levels.

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I. Introduction

Inventory management plays a crucial role in industries located within the Industrial and Port Complex of Pecém (CIPP). This complex, situated in the state of Ceará, Brazil, serves as a pivotal logistics and industrial center, hosting diverse companies across various sectors. Efficient inventory management in Pecém is essential to optimize the production and distribution of goods, ensuring the adequate supply of raw materials and finished products. By maintaining appropriate inventory levels, industries can minimize costs, prevent production disruptions, and effectively meet market demand, thereby contributing to the competitiveness and success of companies in the regional and national economic landscape.

This article addresses the management of Maintenance, Repair, and Operations (MRO) materials inventory in an industry located within the Industrial and Port Complex of Pecém. The industrial area of CIPP accommodates numerous companies, and the diversity of materials used, coupled with associated costs, underscores the critical need for efficient inventory management.

The article also delves into the significance of efficient inventory management in the industry, providing a practical example and offering valuable insights into the challenges faced by companies in this domain. It emphasizes the necessity for improvements to optimize inventory management.

The present research adopts a multifaceted approach to analyze inventory management in the context of the Industrial and Port Complex of Pecém. Initially, an extensive literature review was conducted to establish a robust theoretical foundation for the study. This stage facilitated a thorough understanding of contemporary concepts and practices related to inventory management. Subsequently, an on-site visit was conducted at the facilities of an industry within CIPP, providing the opportunity to directly observe operational processes and inventory management strategies. Additionally, to complement the analysis, a survey was conducted with CIPP employees using the Microsoft Forms platform. This instrument enabled the collection of primary data on perceptions, challenges, and practices related to inventory management, providing valuable insights from professionals directly involved in the process.

The primary objective of this study is to analyze and comprehend the best inventory management practices applied in the Industrial and Port Complex of Pecém (CIPP). This encompasses investigating workers' perceptions regarding satisfaction, identifying problems, and evaluating indicators associated with inventory management. The specific objectives include briefly discussing inventory management and researching how planning and inventory management are conducted in a CIPP company.

This article is structured into five sections. The first is the introduction, presenting the objectives of this research. The second is the theoretical framework, developed from the contributions of authors addressing the same theme. The third is the methodology, explaining the methodological procedures adopted in the research development. The fourth section pertains to the analysis of results obtained in the quantitative research, and finally, the fifth section presents the concluding remarks of this article.

The research aims to significantly contribute to the understanding of operational dynamics and challenges faced by companies in the Industrial and Port Complex of Pecém regarding inventory management.

II. Material And Methods

The methodological approach adopted for the conception of this scientific article is characterized as a mixed approach, consisting of a bibliographic research that relates to the inventory management practices of the visited company, combined with a field research defined within the standards outlined by Yin (2016)[23].

Simultaneously, a study, as defined by Gil (2002, p. 17), is "a rational and systematic procedure aimed at providing answers to the problems proposed[10]." This study was operationalized through the Microsoft Forms platform. The dissemination of the research was conducted comprehensively and extensively, shared through WhatsApp groups belonging to relevant companies in the research context, as well as through the professional network LinkedIn.

Yin (2016, p. 25), discussing qualitative research, states: "its breadth indicates the potential relevance and fascination of qualitative research: unlike other methods in the social sciences, practically every real-life event can be the subject of qualitative study[23]."

For Yin (2016), the case study research is one of several ways to conduct research in the social sciences, being preferred over other methods when there is little or no control over behavioral events, the study's focus is a contemporary event, and when one intends to understand how or why a particular phenomenon occurs[23].

The bibliographic research was directed towards the search for previously published theoretical sources in specialized literature, such as books, scientific articles, and relevant documents. The aim was to provide a more detailed and in-depth explanation of the topics addressed herein, enriching understanding through existing scientific contributions in this area, as well as presenting the planning and inventory management model of an industry located in the CIPP[22].

III. Literature Review

The theoretical foundation of this work has been divided into two essential subtopics. Initially, we will expound on concepts and definitions related to inventory management, and subsequently, we will address the inventory management model for Maintenance, Repair, and Operations (MRO) materials in an industry located in the Complexo Industrial e Portuário do Pecém (CIPP). This theoretical foundation was developed based on a bibliographic study on inventory management, with a special focus on the inventory management policy of the analyzed company[16].

It is worth noting that with the established theoretical base, we delve into the MRO inventory management policy adopted by the company under analysis, providing an in-depth view of the implemented strategies. Following this, the results and analysis of the conducted research will be presented. This crucial step allowed us to connect theoretical concepts to the practical reality of inventory management by sharing data obtained through the research, primarily from professionals working in CIPP.

Thus, it was possible to assess employees' perception regarding Inventory Management, identifying the most pressing indicators and challenges in their respective organizations. In doing so, our aim is not only to

enrich theoretical understanding but also to provide practical insights and applicable recommendations to enhance the efficiency and effectiveness of inventory management in this specific context.

Inventory Management

Inventory management plays a critical role in the operations of companies and organizations, irrespective of the sector or industry. Inventory, comprising raw materials, work-in-progress, and finished goods, is a valuable resource that must be effectively managed to optimize operational performance, reduce costs, and meet customer demands. Modern inventory management is a field of study and practice that has evolved considerably over the past decades, adapting to the complexities of global supply chains and the imperative of efficiency.

Fundamental Concepts

Inventory Levels: Inventory management involves determining appropriate levels of inventory, including safety stock, minimum stock, and maximum stock. Safety stock is maintained to address fluctuations in demand or supply, while minimum stock is the lowest level allowed before replenishment. On the other hand, maximum stock represents the maximum quantity of inventory a company should maintain[18].

Just-in-Time (JIT): The Just-in-Time concept aims to minimize inventory to the lowest possible levels by receiving and producing products only when needed. This helps minimize storage costs and eliminate waste[1].

Demand Forecasting: Demand forecasting is an essential component of modern inventory management. It involves the analysis of historical data and trends to predict future stock needs, enabling companies to prepare to meet market demand[15].

Technology and Information Systems: Technology plays a critical role in modern inventory management. Information systems, such as Enterprise Resource Planning (ERP) and inventory tracking systems, facilitate real-time inventory tracking, simplify management, and enhance decision-making[15].

Supply Chain Management: Modern inventory management considers the integration of the supply chain. It aims to optimize the flow of materials and information throughout the chain, from suppliers to end consumers[14].

Relevant Definitions

Inventory Turnover: Inventory turnover is a measure of inventory management efficiency, representing how many times inventory is sold and replenished during a specific period. The higher the turnover, the more efficient the inventory management[21].

Inventory Holding Cost: This includes storage costs, depreciation, insurance, and the opportunity cost of investing capital elsewhere. Modern management seeks to minimize these costs[21].

ABC Analysis: The ABC analysis is a technique that classifies inventory items into A, B, and C categories based on their importance in terms of value or sales volume. This aids in resource allocation and differentiated attention to critical items[6].

Replenishment Policy: The replenishment policy determines when and in what quantity inventory items should be replenished. It can be based on methods such as the reorder point or continuous review system[4].

As evident, modern inventory management is a multifaceted discipline requiring careful consideration of economic, logistical, and demand factors. As businesses confront increasingly complex challenges in a globalized business environment, the effective application of these concepts and definitions is crucial for success, enabling organizations to optimize resources, meet customer demands, and remain competitive.

Planning and Inventory Management: Visiting a Company in CIPP

Currently, the Complexo Industrial e Portuário do Pecém (CIPP) hosts 30 companies that have made significant investments, totaling R$ 28.5 billion in resources and contributing to the creation of approximately 50.8 thousand jobs, both direct and indirect. Furthermore, the Port of Pecém is responsible for over half of all import and export operations in the state of Ceará.

A strategic partnership with the Port of Rotterdam in the Netherlands has enabled the Pecém Complex to stand out as one of the most modern and efficient centers for import, export, industrialization, and international trade in Brazil (Figures 1). Therefore, the industries established in the Pecém Complex play a fundamental role in the economic development of the state of Ceará.

A visit to the CIPP to closely observe inventory management represents a valuable opportunity in the academic realm. The significance of this enterprise, covering a vast area and handling a variety of materials, provides a conducive setting for the study and analysis of large-scale inventory management practices.

Figure 1: Container Yard and Steel Plates at the Port of Pecém

Source: Researchers' Data

The abundance and diversification of materials used by industries in the CIPP, coupled with the substantial value of immobilized capital and significant inventory maintenance costs, make the adoption of highly efficient materials management imperative. This necessitates the implementation of dynamic and systematic operational methods that enable the precise definition of control parameters to optimize inventory levels. Inventory management should be based on accurate data and analyses, not assumptions or intuitions.

Corrêa and Corrêa (2004) emphasize the crucial importance of inventory forecasting (Figure 03) in logistics and supply chain management. According to the authors, this process is essential for anticipating future demands and planning the necessary inventory levels effectively. They highlight the need for accurate forecasting methods tailored to the nature of the product and the operational context of the organization. Additionally, they emphasize the importance of considering both historical data and market information and future trends, as inventory forecasting is fundamental for optimizing storage costs and efficiently meeting customer demands. Therefore, it is a strategic component for competitiveness and efficiency in logistical operations[5].

Table 01: Synthesis of the main inventory management and control tools

OBJECTIVE OF INVENTORY FORECASTING	
Collection of Relevant Information	Gather pertinent data and information related to the demand and supply factors influencing inventory levels.
Treatment of Collected Information	Process and organize the collected information to ensure accuracy and reliability.
Identification of Behavior Patterns in Historical Data	Analyze historical data to identify patterns and trends that can provide insights into future inventory requirements.
Consideration of Relevant Qualitative Factors	Take into account qualitative factors that may impact inventory needs, such as market conditions, customer preferences, and external influences.
Projection of Behavior Patterns	Utilize the identified patterns to project future inventory demands and fluctuations.
Estimation of Forecast Errors	Assess and estimate the margin of error in the forecasting process, acknowledging that uncertainties and unforeseen events may affect the accuracy of predictions.

Source: Adapted from Corrêa and Corrêa (2004, p. 123)[5]

The main objective of inventory forecasting is to help companies make informed decisions about stock levels, ensure efficient supply chain management and ensure that customer needs are met quickly and cheaply.

According to Pozo (2007), the planning and control functions are fundamental in effective production process administration[17]. Not being an exception, inventory management involves making strategic decisions regarding stock levels, location, transportation, demand, and supply, aiming to effectively balance costs with service levels. Complementing this argument, Gonçalves (2020) states that production requires inventory to avoid interruptions and enhance its processes, sales aims to purchase abundantly for better prices, and finance does not want to immobilize capital.

Maintaining Maintenance, Repair, and Operations (MRO) material stocks at the scale of companies in the CIPP presents a highly complex challenge. This challenge demands the use of highly effective instruments and methods capable of providing precise information at all times to support decision-making.

According to Ballou (2006, p. 277), "managing inventory is also about balancing the availability of products or services to the consumer. Knowing supply costs is necessary to determine the extent of this availability."[2] In other words, the inventory manager must seek a careful balance between ensuring that products are readily available to meet customer demand and minimizing the costs associated with maintaining and replenishing these stocks.

Morais and Monteiro (2019) further define inventory as any accumulation of supply materials that a company or institution maintains to fuel its production process. Similarly, inventory management is seen as an objective to permanently reduce expenses and generate fewer costs for the company. Based on these definitions, it can be said that maintaining inventory levels compatible with the service level requirements of production and maintenance while simultaneously enhancing efficiency and effectiveness of financial costs has been the significant challenge in the supply chain area[3, 12].

Aiming to overcome the challenges in inventory planning and management, we observed that the visited company adopts standard tools that assist in the control and performance of inventory management activities. The methodology developed is made available in the form of a handbook (Figure 04) to execute materials management techniques. This handbook, in addition to the contributions from operational teams, was grounded in Daniel Gasnier's book (2002)[8], "A dinâmica dos estoques: um guia prático para planejamento, gestão de materiais e logística" (The Dynamics of Inventory: A Practical Guide for Planning, Materials Management, and Logistics).

Figure 2: Inventory Management Handbook Cover (image altered to conceal the name of the visited company)
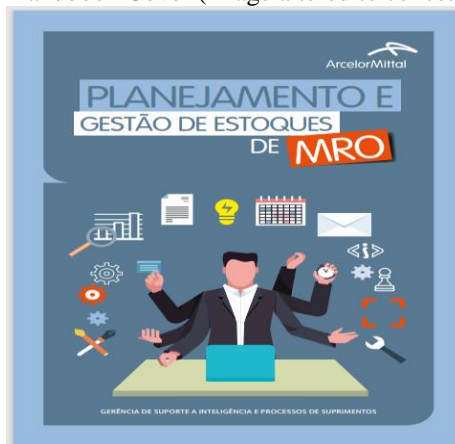
Source: Researchers' Data

The development of this handbook is essential for standardizing activities, providing the inventory management team with a quick and guided self-management reference. According to Martins and Campos (2000, p. 40),

One of the key resources for any company is its human resources, which increasingly require a high level of education, not only in technical terms but also with a team spirit, a willingness to work collaboratively, and behavior that allows self-management[11].

The handbook establishes criteria for defining spare parts inventory management policies, which are carried out through the classification and segmentation of each Stock Keeping Unit (SKU), using parameters indicated in Figure 5. According to Martins and Campos (2000, p. 167),

A detailed analysis of inventories is a requirement for every materials manager. Not only because of the volumes of capital involved but mainly due to the competitive advantage that the company can gain by providing faster and more accurate customer service[11].

We emphasize the critical importance of inventory management for operational efficiency, minimizing tied-up capital, and offering a competitive advantage. The proposal of a handbook to share standards and methods of inventory management provides a valuable educational resource, meeting the need for a detailed inventory analysis based on the criteria presented in Figure 05, and promotes practical guidelines for operational optimization, thereby strengthening business competitiveness.

Figure 3: - Synthesis of the main inventory management and control tools

A - High Priority Items	**X - Non-Critical Items**
B - Intermediate Priority Items	**Y - Intermediate Non-Critical Items**
C - Low Priority Items	**Z - Critical Items**
	ZZ - Strategic Items
P - High Popularity	
Q - Medium Popularity	**1 - Complex Acquisition**
R - Low Popularity	**2 - Difficult Acquisition**
N - Null Popularity	**3 - Easy Acquisition**

Source: Adapted from Gasnier (2016)[9]

Table 1 establishes the relationship between classification parameters, material segmentation, and their respective interest relationships.

Table 02: Classification and Related Interactions

Classification Code	Classification	Perspective
ABC	Value	Economic
XYZZZ	Criticality	Customer
123	Acquisition	Supplier
PQRN	Popularity	Operation

Source: Adapted from Gasnier (2016)[9]

The Inventory Management Classification Code, as defined by Daniel Gasnier (2016), encompasses four main categories: ABC, XYZZZ, 123, and PQRN. Each of these codes represents a specific approach to efficient stock resource management[9].

For instance, the ABC method prioritizes items based on their financial relevance, allowing segmentation into categories according to their strategic importance and sales value. On the other hand, code XYZZZ emphasizes the significance of sales history and demand.

Code 123 focuses on the frequency of product movements, while code PQRN considers criteria such as item lifecycle and criticality. These classifications provide an important guide for material administrators in deciding how to allocate resources and efforts in inventory management.

Additionally, the handbook serves as a standardized guide, enabling a unified understanding among team members and promoting operational efficiency. Ultimately, by adhering to standards established by experts such as Daniel Gasnier (2016), the company can achieve higher levels of competitiveness by ensuring more effective management aligned with industry best practices[9].

Table 3 presents a synthesis of the main inventory management and control tools and their definitions used by the visited company:

Table 03: - Inventory Management Tools

TOOL	CONCEPT	APPLICATION
ABC Classification	ABC Classification is a Pareto categorization process based on a relevant criterion for prioritizing management efforts. This criterion assesses the significance of items in material expenditures, where expenditure is defined as the unit cost multiplied by the quantity of consumed items.	A High Expenditure: Items corresponding to 80% of the cost. B Medium Expenditure: Items corresponding to 15% of the cost. C Low Expenditure: Items corresponding to 5% of the cost.
XYZZZ Classification	Similar to the ABC classification, the XYZZZ classification involves segmenting inventory items based on the criterion of criticality, providing additional information for planning, replenishment, and management routines. The objective of this criterion is to determine the risk and degree of impact of material shortages on the production process.	Criticality Type - ZZ-Strategic: Indicates that the material item should be stocked to ensure operational availability, and its absence represents a serious situation for the company. Criticality Type - Z-Critical: Characterizes the level of criticality of the material item, with the potential to halt production within its application area. Criticality Type - Y-Intermediate: Characterizes the intermediate level of criticality of the material item, with the potential to affect production within its application area. Criticality Type - X-Non-Critical: Characterizes the non-critical level of the material item, indicating that its absence does not impact production.
PQRN Classification	The Popularity classification measures the frequency of occurrences of pickings, shipments, or trips involving a specific SKU observed during the analysis period. Its determination is straightforward, counting each time material is withdrawn, regardless of the quantity	P High Popularity: >= 9 occurrences per year. Q Medium Popularity: >= 3 and < 9 occurrences per year. R Low Popularity: > 0 and < 3 occurrences per year. N Null Popularity: No consumption record for the year.

	of pieces in that withdrawal.	
123 Classification	This classification pertains to the acquisition process of items, taking into consideration various factors that impact the provisioning lead time.	1 High Complexity: Lead Time >= 45 days. 2 Medium Complexity: Lead Time >= 15 and < 45 days. 3 Low Complexity: Lead Time < 15 days.

Source: Adapted from Gasnier (2016)[9]

In this manner, materials are assessed and categorized, as outlined in Table 02, through a process termed by Gasnier (2016, p. 43) as the "routing tree." This process, facilitated by the ERP system, systematically applies predefined policies, strategies, tactics, rules, and procedures[9]. Its primary aim is to strike a balance between immobilized working capital and service levels, ultimately optimizing both service deliveries and inventory. Consequently, this approach determines the treatment of each material, as detailed in Table 04.

Table 04: Inventory Management Tools

Inventory Management Policy	Definition of Inventory Management Policy	Reorder Point	Maximum Inventory	Safety Stock	Operation Type
Zero Inventory - Inclusion	New Codes - Deterministic demand, yet to be defined	NO	NO	NO	Stockout - Requisition With stock - Reservation
Operational Safety	Items with extremely low turnover or zero turnover per year, deemed strategic or of high criticality	YES	NO	NO	Always Reserved Replenishment = Planned Order
Just In Time	Items with zero inventory characteristic, exhibiting a trend of low to medium lead time, and with low to intermediate criticality.	NO	NO	NO	Stockout - Requisition With stock - Reservation
Minimum/Maximum Inventory	Items with characteristics of medium turnover and high to strategic criticality, with medium to high lead time.	YES	YES	NO	Always Reserved Replenishment = Planned Order
Automatic Reorder Point	Items with a regular turnover characteristic, demonstrating stable patterns while coexisting with peaks and valleys.	YES	NO	NO	Always Reserved Replenishment = Planned Order
Repair Items	Items defined as repairable, with deterministic demand.	NO	NO	NO	Stockout - Requisition With stock - Reservation

Source: Adapted from Gasnier (2016)[9]

The handbook is evidently geared towards standardizing the activities of inventory managers by shifting towards reliance on accurate data and precise analyses, as opposed to assumptions or intuitions. The ultimate aim is to achieve a perfect balance between excess and scarcity. In accordance with Gasnier (2016, p. 395), "by employing good judgment, statistics, and computing correctly, the probability of success can be increased[9]."

Therefore, based on the observations made during the company visit, we can conclude that efficient inventory management demands technology, a thorough analysis of historical and projected demand, coupled with a clear understanding of seasonal patterns and market trends.

IV. Result

In this section, we present the results of the research entitled "Inventory Management," developed by the researchers themselves and shared with professionals connected to the industry or possessing logistical knowledge, via WhatsApp and LinkedIn, using Microsoft Forms. The questionnaire, consisting of five objectively framed questions, was responded to by thirty-eight (38) workers from various sectors within the CIPP, encompassing inventory management.

This dissemination strategy facilitated obtaining responses from professionals directly involved in the logistical operations of the studied organizations, lending robustness and relevance to the collected data. By adopting this approach, we aimed to ensure a representative and meaningful sample, enabling a precise and comprehensive analysis of inventory management practices within the context of the Complexo Industrial e Portuário do Pecém.

Furthermore, in order to broaden the reach of the research and facilitate access for potential respondents, the dissemination strategy through QR Code was employed (Figure 07). This resource provided a

convenient and user-friendly alternative, allowing interested parties to directly access the questionnaire through mobile devices.

Figure 4: QR Code for the Research

Source: Researchers' Data

Figure 8 aimed to identify issues related to inventory management, and the most commonly reported problem, with 13 responses, was Lack of Planning (delay or anticipation). The lack of planning in inventory management poses a challenge for the industries in CIPP. According to Martins and Campos (2000), the absence of effective planning can lead to adverse consequences such as excess inventory, high storage costs, and product obsolescence[11].

Figure 5: What problem related to inventory management does your company most frequently encounter? (Question 02)
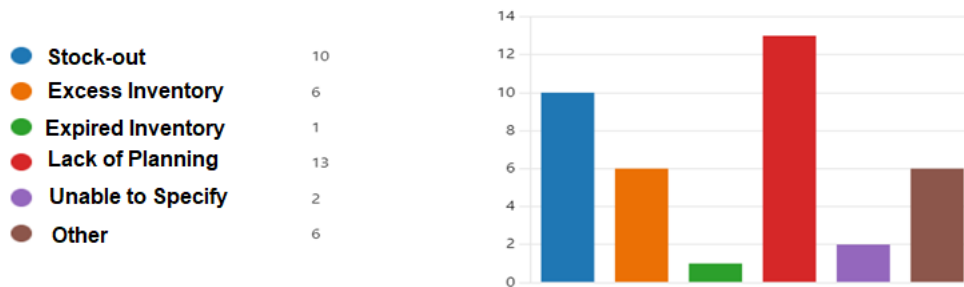
Source: Researchers' Data

Figures 6, 7, and 8 are presented together as they are intrinsically connected. In question 04, Figure 11, the Net Promoter Score (NPS) methodology was employed, originating from Fred Reichheld's article for the Harvard Business Review in 2003[13, 19, 20]. Subsequently, alongside Markey, he released the book "The Ultimate Question" in 2011, which explains the operation and applicability of the customer loyalty measurement methodology, based on a question with response options on a scale from 0 to 10. The central question of NPS is to assess how likely a consumer would recommend the service or product to a friend. "The scale has three levels: detractors (0 to 6), passives (7 and 8), and promoters (9 and 10)"[7, 12].

**Figure 6:** Relationship between question 03 and 04 (images 11 and 12)
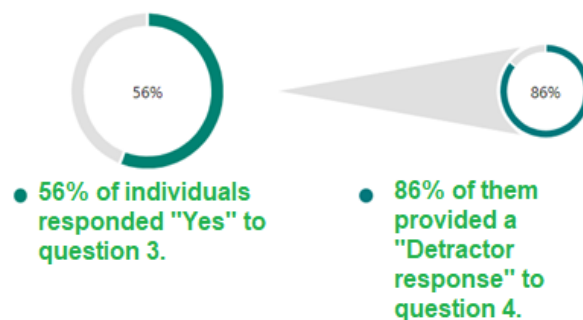
Source: Researchers' Data

It can be asserted that a portion of this dissatisfaction is related to equipment/process downtime due to lack of material in stock, given that 86% of individuals who responded "Yes" to question 03 (Figure 10) provided a Detractor response to question 04.

Figure 7: Has there been production stoppage due to a lack of parts/materials in stock? (Question 03)
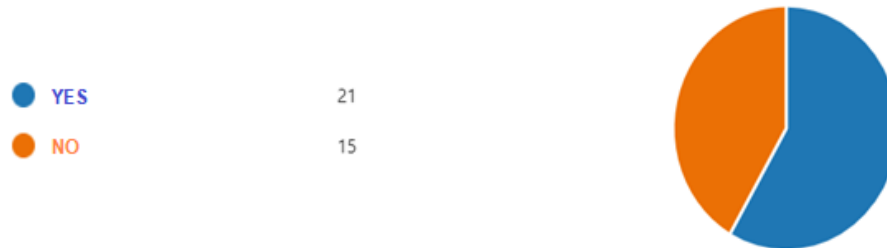
Source: Researchers' Data

This direct connection between material availability and worker satisfaction underscores the need for more robust and effective strategies to ensure timely availability of essential inputs. The finding provides valuable insight into a crucial point for improvement in inventory management within the companies of the Industrial and Port Complex of Pecém.

The result of question 04 (Figure 8) yielded an NPS of -44, indicating an unfavorable outcome in the inventory management survey. This suggests a significant proportion of respondents are dissatisfied or critical of the current inventory management process.

Figure 8: How do you rate the Inventory Management of your company? (Question 04)

Source: Researchers' Data

The fifth and final question of the survey (Figure 09) reveals that 44.7% of the respondents are not familiar with any type of inventory management indicators.

Figure 9: Are you familiar with Inventory Management indicators? Which ones does the company you work for have? (Question 05)
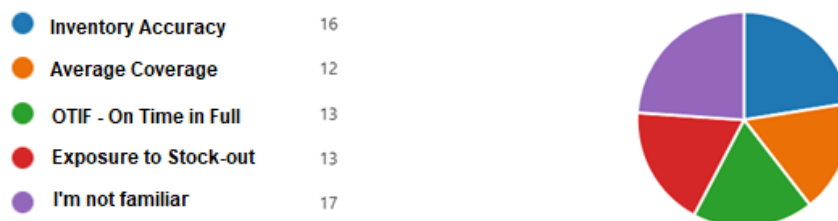
Source: Researchers' Data

The results highlight challenges to be overcome, such as the lack of planning in inventory management. They also reveal that a lack of knowledge regarding inventory management process indicators may lead to inadequate and ineffective decision-making in management.

Therefore, it is crucial that professionals are properly informed and trained in the interpretation and application of process indicators to ensure the effectiveness of operations and the attainment of the organization's strategic objectives.

V. Conclusion

The visit to the CIPP company highlighted the need to implement more effective practices to ensure efficient inventory management. Standardizing the activities of inventory managers based on accurate data and analysis emerges as a key element to balance inventory excess and scarcity. Creative solutions, such as the inventory management handbook, can be adopted to achieve this objective. Additionally, the application of tools such as ABC classification and material segmentation is essential to optimize inventory levels and align costs with the desired service level.

The research results indicate that a lack of planning in inventory management is a common issue, potentially leading to challenges such as inventory excess and product obsolescence. Furthermore, the research reveals that a significant portion of respondents is dissatisfied with the current inventory management process, indicating the need for improvements in this area. The investigation emphasizes the importance of effective inventory management to enhance company service levels and profitability, with customer satisfaction being a crucial aspect.

The conducted research fully met the established objectives, providing a comprehensive and valuable insight into inventory management practices in the industries of the Industrial and Port Complex of Pecém (CIPP). The obtained results offer an in-depth understanding of the challenges faced by companies, highlighting the recurring issue of a lack of planning in inventory management.

Furthermore, it is categorical that companies should promote the training and continuous development of their inventory management teams, empowering them to make informed and strategic decisions. By following these recommendations, organizations will be better prepared to address inventory management challenges and achieve an effective balance between customer service and operational efficiency.

In conclusion, it is recommended that CIPP companies take concrete measures to enhance their inventory management processes. This includes the implementation of modern technologies, a thorough analysis of demand, and a deep understanding of seasonal patterns and market trends.

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