



ISSN ONLINE: 2447-0228

ITEGAM-JETIA

Manaus, v.9 n.44, p. 35-48. Nov/Dec, 2023
DOI: <https://doi.org/10.5935/jetia.v9i44.1010>



RESEARCH ARTICLE

OPEN ACCESS







LOGISTICS MANAGEMENT: A FUTURE PERSPECTIVE ON LOGISTICS PROCESSES WITH THE APPLICATION OF THE 5S METHOD AT BRAMAM COMPANY IN PARINTINS, AMAZONAS

Roberta Pontes da Costa*¹, Thiago Mendonça de Souza², Bruna Lorryne Vasconcelos Barros³, Vanessa Coelho da Silva⁴, Emanuel Kedson da Silva Freitas⁵ and Aderli Vasconcelos Simões⁶

^{1, 2, 3} Department of Management Process Technology, Faculty of Technology – SENAC, Manaus, Amazonas, Brazil.

^{4, 5} Department of Intellectual Property, Technology Transfer and Innovation - PROFINIT/UEA, State University of Amazonas – UEA, Manaus, Amazonas, Brazil.

⁶ Department of Administration, State University of Amazonas – UEA, Manaus, Amazonas, Brazil.

¹ <http://orcid.org/0009-0006-1047-8149> , ² <http://orcid.org/0009-0008-3105-1149> , ³ <http://orcid.org/0009-0006-6542-0446> ,
⁴ <http://orcid.org/0009-0007-0006-3705> , ⁵ <http://orcid.org/0009-0002-9803-7137> , ⁶ <http://orcid.org/0009-0008-0822-3424> 

Email: *robertinpontes@gmail.com, thiagobramamm@gmail.com, brunanarros26825@gmail.com, vcsilva@uea.edu.br, kedsonfreitas2015@gmail.com, asimoes@uea.edu.br

ARTICLE INFO

Article History

Received: December 13th, 2023

Revised: December 26th, 2023

Accepted: December 27th, 2023

Published: December 30th, 2023

Keywords:

5S Program,
Logistics Sector,
Continuous Improvement.

ABSTRACT

This project required a study of the 5S program, involving commercialization and logistics in the municipality of Parintins. In this context, the implementation was carried out at Bramam, a beverage industry located in this municipality. The aim was to improve the efficiency and organization of its logistics operations by implementing an improvement project based on the 5S program, a widely used Japanese methodology for promoting organization and discipline in work environments. The general objective of the 5S project at Bramam was to promote a cultural change among employees, focusing on continuous improvement, through the implementation of the program's five principles: sorting, setting in order, systematic cleaning, standardizing, and sustaining. These principles were applied in the logistics sector, assessed in three departments: warehouse, trucks, and forklifts, aiming to enhance the use, organization, cleanliness, maintenance, and discipline in the use of these machines, seeking positive results in terms of efficiency, productivity, safety, and quality. With this research, we expect to obtain relevant insights and conclusions that can contribute to understanding the effectiveness of the 5S program in the logistics sector of the beverage company under study. The project is implemented with results that can be used as a basis for the implementation or improvement of the 5S program in other organizations, aiming to enhance the quality of services and operational performance in the workplace.



Copyright ©2023 by authors and Galileo Institute of Technology and Education of the Amazon (ITEGAM). This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

I. INTRODUCTION

Logistics management is an area that has been increasingly developing, aiming to improve logistics processes to ensure greater efficiency and cost reduction. In the context of the Parintins market, logistics plays a vital role in product availability, especially during the Folk Festival when demand significantly increases, requiring enhanced management in this process.

In this context, the application of the 5S method can be an excellent tool to improve the organization and availability of materials and equipment in companies. The 5S method is a management philosophy that aims to improve process quality, increase productivity, and consequently, enhance the efficiency of the company. Applying the 5S method in logistics management can bring benefits such as reduced waiting times, decreased waste, improved product quality, and optimization of storage space.

Moreover, it allows for better product identification and greater agility in the separation process for delivery.

In this regard, this research aims to analyze the application of the 5S program in the logistics sector of the company "Bramam Comércio de Bebidas Limitadas" located in the municipality of Parintins. Specifically, we seek to understand the company's situation and identify factors that influence the quality of logistics services. Additionally, we intend to conceptualize the positive aspects of the 5S program and demonstrate its applicability in logistics processes.

The methodology used in this research is qualitative, involving the collection of information that supported the identification and resolution of problems related to the implementation of the 5S program in the beverage company in Parintins. To achieve this, we analyzed sequences of procedures that were subjected to systematic evaluation, aiming to understand the impacts on the development and progress of program implementation.

In the planning and strategy of the study, a feasibility analysis of the project was carried out, considering the time required for the project's stages, as well as the bureaucratic procedures required to obtain authorization from the company for the research to be conducted satisfactorily.

Considering the feasibility of the research, a literature review was conducted to theoretically underpin the study, seeking literary sources that would support the theoretical foundations of the 5S program. Subsequently, the study location and research procedures were planned, as well as the legal procedures for its implementation, including authorization for experiments, definition of execution time, resources used, and participant profile and characterization.

This research was motivated by the need to gain in-depth understanding of the process of implementing the 5S program in a beverage company located in Parintins. The aim is to analyze the stages and results obtained throughout this process in detail, aiming to contribute to the proper functioning of the business and generate positive results in terms of profitability.

It is important to emphasize that this research proposal seeks not only to understand the application of the 5S program but also to contribute to improving the company's performance in terms of operational efficiency and service quality. The 5S program is widely used in many organizations around the world, proven to be effective in promoting a culture of organization and discipline in the workplace.

In this project, the 5S program was chosen as a research source due to its relevance and applicability in the logistics sector of the beverage company under study. Through a careful analysis of the program implementation stages, the results obtained, and the impacts on the company's development and progress, we aim to identify the positive aspects of this methodology and its applicability in logistics processes.

II. THEORETICAL FRAMEWORK

II.1 QUALITY MANAGEMENT

Quality management is one of the main managerial methods used today, given the need to seek proper training and management of human resources in companies. [1] states that the new development ideology assumes that producing with better quality means producing with greater productivity, which results in less waste, less work, and consequently, lower costs.

In the current market, constantly seeking cost reduction is essential, and for this, it is necessary to manage the company's

resources effectively through quality management, focusing on processes and products, aiming to achieve positive results. To do so, understanding the needs of each department or sector of the organization is crucial for any enterprise.

Defining quality management is a challenging task, as over time this approach has adapted to market changes. Initially, quality management was viewed from the perspective of inspection, using measurement instruments, with the premise of focusing only on results, not on processes. However, today, quality management is focused on strategic quality management, with a concern for competing in the market and satisfying both customer and market needs.

In a broader sense, the concept of total quality management or quality management has come to mean a management model that seeks organizational efficiency and effectiveness. (JUNIOR, 2003) [2].

Quality management went through four significant periods in its history. The first was the era of inspection, developed by craftsmen and artisans who worked informally but took the first steps toward operational quality management, presenting "rudimentary standards of quality for goods and services and basic levels of labor performance, with the determination of general conditions of human work" [3]. This era became known as the Era from the Field to the Market, beginning at the turn of the 20th century, with agrarian economics as the main theoretical influence, and its main concern was transportation.

The second period was marked by statistical quality control, where the inspection process had already been improved, as the industrial process had been established and its growth made manual production verification impractical. The publication of W. A. Shewhart's work "Economic Control of Quality of Manufactured Product" in 1931 represented a milestone in the quality movement, giving it a scientific character. In this period, quality assurance emerged, where quality was from being a narrow discipline based solely on factory production, it has broader implications for management. The goal in this era was to separate the good from the bad products through statistical sampling, starting with mass production and reaching its peak during World War II when there was a need to precisely control the quality of millions of items manufactured for the war effort. "The objective now is to separate the good from the bad products through statistical sampling. This era began with mass production and saw the emergence of the quality control department in company structures". [4].

Advancements in quality occurred with the rapid growth of the industry, even with unskilled labor, which affected the quality levels of products/services. The third era of quality takes a more comprehensive approach, going beyond just product quality and managing all members of the organization, seeking proactivity as a guarantee of positive results in problem-solving.

The Era of Quality Assurance realizes that all processes and aspects affecting quality must be considered, including suppliers, and it adopts a broader perspective. During this period, a consolidated management of supply transportation, distribution, storage, inventory control, and material handling activities emerged.

In the fourth era, we have Total Quality Management (TQM), which from the 1980s onwards places the customer as one of the main focuses. The concern is no longer just on the factory floor but seeks to understand the customer as a fundamental part of the process and develop strategies to attract and satisfy the customer. The development of quality management in each era aims to identify and solve market performance challenges, proposing solutions to improve company performance.

II.1.2 Quality Tools

With the advent of globalization, the perspective of commerce has changed significantly. Competition is no longer limited to the local market but rather global competition, where any company can offer a similar product. The differentiator has become which company the customer will feel motivated to buy from and how to earn their loyalty. As a result, quality has shifted from being merely a differentiator to becoming a requirement for all companies wishing to stay active in the market.

Quality management has become essential for companies to face this fierce competition. There are several quality management tools used to ensure continuous process improvement and customer satisfaction. Some of the key tools include:

- PDCA (Plan-Do-Check-Act): It is a cycle of continuous improvement that involves planning, executing, checking, and acting to implement changes and improvements in processes.
- Ishikawa Diagram (also known as a cause-and-effect diagram or fishbone diagram): It is a visual tool that helps identify and analyze the causes of a problem, allowing for the search for suitable solutions.
- Flowcharts: These are diagrams that graphically represent the steps of a process, helping to identify bottlenecks, rework, and improvement opportunities.
- Brainstorming: It is a group idea generation technique, stimulating creativity and involving everyone in identifying solutions.
- 5W2H (What, Why, Where, When, Who, How, How much): It is a tool that helps define actions clearly and in detail, identifying what, why, where, when, who, how, and how much will be done.

These are just some of the many tools available in quality management. The proper use of these tools can help companies identify and correct problems, optimize processes, and achieve high levels of quality in their products and services, which is essential to meet customer expectations and remain competitive in the globalized market.

II.1.3 5S Program

The 5S program originated in Japan in the mid-1950s, shortly after World War II, as a strategy to help companies recover from the post-war crisis and make significant advancements in quality management.

The 5S correspond to five Japanese words that represent objectives for change in organizational processes. Each word carries a specific objective for improving functions. They are: Seiri (sense of utilization), Seiton (sense of organization), Seiso (sense

of cleanliness), Seiketsu (sense of health/hygiene), and Shitsuke (sense of self-discipline) [5].

II.1.2.1 SEIRI – Sense of Utilization

This involves organizing spaces within the company to facilitate the search for files or any other elements, identifying and organizing everything for easy access for anyone. When it comes to this sense, the priority is to catalog all items in the department to organize them into folders and cabinets, facilitating access and streamlining processes. [6].

II.1.2.2 SEITON – Sense of Organization

The sense of organization aims to organize the work environment by putting each element in its proper place. When dealing with the professional environment, it is important for each department within a company to have control over each situation, as each department receives demands that need to be addressed on time for the smooth operation of the process. [7].

II.1.2.3 SEISO – Sense of Cleanliness

Maintaining a hygienic work environment involves eliminating potential factors contributing to dirt accumulation, resulting in numerous benefits such as improved physical and mental health, improved internal and external workplace image, reduced maintenance, among others. [8].

II.1.2.4 SEIKETSU – Sense of Health

Providing a workplace favorable to mental and physical health, seeking to eliminate factors that may negatively affect employees' performance. The initial results of the health sense, according to [9], are important to note that a healthy work environment allows for improved productivity because employees feel comfortable performing their duties. The traditional approach of supervising employees can generate stress and hinder task execution.

II.1.2.5 SHITSUKE – Sense of Self-discipline

Incorporating defined standards and procedures into daily life by committing to maintaining the senses in the work routine. The sense of self-discipline suggests that employees should be knowledgeable about the company's rules and regulations. Therefore, employees can control their actions, avoiding conflicts. Knowing only individual responsibilities is not enough; a deeper understanding of the company's objectives is required. [7].

The 5S program is an efficient method in the current scenario where companies are constantly striving for improvement. It emerges as a way to achieve good results with low costs. According to [10], "The implementation of 5S results in improvements in quality, organization, and optimization in any company, regardless of its industry or size. It is a philosophy, a new culture that requires the commitment and participation of work teams."



Figure 1 - 5S Scheme.

Source: [11].

II.2 LOGISTICS IN ORGANIZATIONS

Meeting the demands of the consumer market and adhering to required standards involves greater organizational capacity in materials management. Thus, the ability to offer quality goods and services to customers will be greater. However, to achieve this goal, a company must develop appropriate planning tailored to its goals and effective control of resources. Adequate planning for organization is tied to the logistics sector, which, in general, is responsible for delivering the product with quality, at the right time, and at an affordable price.

Logistics, according to the Council of Logistics Management [12], is seen as a process of planning and effectively controlling the flow and storage, capable of managing costs from raw materials to inventory, managing product information from its origin until the point of consumption with the proposal to deliver a quality product that meets the demands of its customers. For a long time, logistics was mistakenly understood as a process of transporting products. However, according to [13], it is a science that aims to solve problems from input to the production sector, still concerned with finished and semi-finished distribution issues and other warehouse facilities, information processing, including spatial and temporal constraints. "Logistics has evolved from a narrower focus on the physical distribution of materials and goods to a broader scope, considering the entire supply chain and activities such as purchasing, material management, and distribution" [14].

The [15] theorizes that the primary concept of logistics is the strategic management of movement, warehousing, product organization, and resources to achieve profitability with low costs. In other words, the interrelation of operational sectors should share the same premises to achieve profit.

Organizations encompass various areas that need to function properly and in common agreement. As we know, managing a business requires not only delivering the service/product but also aligning with human principles that provide dignity to workers, administrative principles of planning, organizing, directing, and controlling, and environmental principles related to product quality and its ecological treatment. In a globalized world and facing an increasingly competitive market, it is a requirement that every business is seeking to update its practices. Moreover, after the scenario of the COVID-19 pandemic, significant investments in the convenience of buying and receiving products quickly and with higher quality were observed.

Amid these sudden changes in the market, it is of utmost importance to be in constant transformation. It's not about changing all the time but seeking methods to bring the consumer closer to

the offered product. This means presenting the product at the right time with the right price.

To meet the demands of the consumer market and adhere to required standards, it is essential for companies to have efficient management of their logistics operations. A well-structured and managed organization has a greater ability to offer quality goods and services to customers. To achieve this goal, it is essential to develop appropriate planning aligned with the company's goals and effective control of available resources.

Proper planning is directly related to the logistics sector, which is responsible for ensuring the delivery of the product with quality, on the correct schedule, and at an affordable price. Logistics encompasses various activities, such as transportation, warehousing, inventory management, procurement management, and distribution, among others. Efficient logistics management contributes to cost reduction, increased productivity, and improved service to customers.

Furthermore, logistics also plays a strategic role in the company, contributing to competitiveness in the market. A well-structured and managed supply chain allows for greater agility in operations, flexibility to deal with market changes, and better utilization of available resources. Logistics can also help identify improvement opportunities through the analysis of performance indicators and process monitoring.

In this context, investing in technology, automation, and integration of logistics processes is crucial to optimize operations and ensure the efficiency of the supply chain. Additionally, it is essential to promote a culture of continuous improvement, encouraging employee training and teamwork to identify optimization opportunities and implement corrective actions.

III. MATERIALS AND METHODS

The methodology of this research consists of applying scientific procedures and techniques to seek answers to the proposed objectives. Following the definition of [16], the methodology examines, describes, and evaluates research methods and techniques that allow for the collection and processing of information to address and solve problems.

In this sense, this research is of a qualitative nature, as it considers the researcher as the main element for data collection. According to [17], qualitative research does not have a quantitative character but seeks to understand situations. This approach was chosen because it is favorable to the analysis of the implementation of the 5S program in a beverage company in Parintins, which is the focus of this research.

Based on the described procedures, it can be affirmed that the type of research adopted is a field case study since the

researcher leaves their environment in search of answers. Data collection will be conducted under natural conditions where phenomena occur, without interventions or handling by the researcher, using intensive direct observation and structured interviews as data collection techniques.

To conduct this qualitative research, data collection strategies were adopted to support the resolution of the problems identified in the implementation process of the 5S program. Additionally, a feasibility study of the project was conducted, considering the time required for the development of the stages, as well as the bureaucratic procedures for obtaining authorization from the company to conduct the research.

Literature review was a fundamental step to theoretically support the research, seeking references and literary means to underpin the theoretical foundations of the 5S program and its application in the logistics area. Planning and study strategies were carefully developed, including the definition of the research location, the legal procedures for conducting the research, the execution time, the resources used, and the characterization of the participants.

With the completion of this research, it is expected to obtain relevant insights and conclusions that can contribute to understanding the effectiveness of the 5S program in the logistics sector of the beverage company under study. These results can be used as a basis for the implementation or improvement of the 5S program in other organizations, aiming to enhance the quality of services and operational performance in the workplace.

The research on the 5S program encompasses different areas, but it is implemented in the Bramam company in the logistics sector. The research aims to explore the benefits, challenges, impacts, and best practices related to the implementation and maintenance of the 5S program.

In the context of data collection, various instruments can be used to obtain information about the application and effectiveness of the 5S program.

To achieve the results, the research followed the following procedures:

i. Feasibility Study: In this stage, the feasibility of the project was assessed, including an analysis of the available time for the study's implementation and the company's authorization for research execution.

ii. Literature Review: Following the feasibility analysis, a literature review on the chosen topic was conducted to provide a foundation for the research project.

iii. Study Planning: During the study planning phase, various activities were organized, including the definition of the research location, obtaining permission to conduct the experiment, determining the experiment's duration, resource allocation, participant characterization, observational study, and the development of post-test questionnaires.

iv. Study Execution: In this stage, the planned activities from the previous stage were executed, involving intensive direct observation and structured interviews in the logistics sector of the Bramam company, where the 5S program will be implemented.

IV. DISCUSSION OF RESULTS

The implementation of the 5S program at Bramam company was a strategic initiative to improve internal processes' organization, cleanliness, and efficiency. However, during the program's implementation, one of the main challenges faced was the self-discipline of employees.

Self-discipline is one of the fundamental principles of the 5S program, involving the ability to maintain consistent habits of

organization, cleanliness, and standardization in the workplace. However, not all employees were accustomed to rigorously following the established procedures, which created difficulties in program execution.

To overcome this challenge, Bramam company implemented a series of actions, such as specific training and awareness sessions regarding the importance of self-discipline in the context of the 5S program. Awareness meetings and practical activities were conducted to demonstrate to employees the benefits and positive results that could be achieved through the adoption of self-discipline.

Furthermore, mechanisms for monitoring and tracking the 5S program were established, with regular inspections to verify compliance with established procedures and identify improvement opportunities. Employees were encouraged to share ideas and suggestions to enhance the program and make it more effective. The results will now be presented according to each observed sector:

IV.1 5S PROGRAM IN THE WAREHOUSE

The 5S program is a management methodology aimed at promoting organization, cleanliness, standardization, discipline, and continuous improvement in the workplace. At Bramam Parintins, the implementation of the 5S program in the warehouse yielded both positive and negative points, as described below:

IV.1.1 Positive Points

1. Improved Organization: The implementation of the 5S program in Bramam Parintins' warehouse resulted in a significant improvement in storage space organization. Clear standards for arrangement, material identification, and specific locations for each type of item were established. This facilitated the location and access to materials, reducing search time and improving operational efficiency.

2. Increased Productivity: With a more organized and clean warehouse, Bramam Parintins' employees started working more efficiently and agilely. The reduction in time spent searching for materials, the standardization of storage processes, and the elimination of unnecessary or obsolete items contributed to increased warehouse productivity.

3. Safer Work Environment: The 5S program also brought improvements to workplace safety in Bramam Parintins' warehouse. The elimination of unnecessary or poorly-maintained materials and objects reduced the risk of accidents and falls. Additionally, regular cleaning and standardization of storage processes contributed to creating a safer and healthier work environment.

IV.1.2 Negative Points

1. Resistance to Change: The implementation of the 5S program may have faced resistance from employees, especially those who were accustomed to working in a disorganized manner without clear standards.

2. Lack of Self-Discipline: Self-discipline, one of the fundamental principles of the 5S program, may have been a negative point in its implementation in Bramam Parintins' warehouse.

3. Need for Constant Monitoring and Follow-up: Maintaining the 5S program requires constant monitoring and follow-up to ensure adherence to established procedures.

IV.2 5S PROGRAM IN THE TRUCKS

IV.2.1 SEIRI

The first "S" of the 5S program is "Seiri," also known as "Sort" or "Selection." It is the initial stage of the 5S program,

involving the identification and elimination of unnecessary, obsolete, excessive, or unused items in the workplace to create a clean, organized, and efficient space. For a better understanding of the results obtained, the tables below will explicitly show which employee conducted the assessment and their assessment in percentages according to the questions asked:

Table 1 – Questions Asked to Employees and Responses Obtained.

SELECTION				
1	2	3	4	5
Is the cab free of products, containers, and unnecessary items?	Is the vehicle's documentation in an appropriate location, within a single folder, easily accessible, and known to all?	Are the cabin upholstery in good condition (without tears and exposed metal)?	Is the tracking device in good condition (clean, without cracks in the screen and/or chips)?	Are the bays in good condition (without tears, rust, and/or sharp edges)?
OK	OK	OK	OK	OK
OK	OK	OK	OK	NOK
OK	OK	OK	OK	OK
OK	OK	OK	OK	OK
OK	OK	OK	OK	OK
OK	OK	OK	OK	OK
OK	OK	OK	OK	NOK

Source: Authors, (2023).

This shows that Bramam Parintins company has achieved positive results in the implementation of the first "S" (Seiri) of the 5S program. The high score of 100% in almost all assessed items indicates that the company has excelled in organizing and selecting necessary items in the workplace. However, it is important to note that the fifth question, which had more negative situations, may indicate that there are still areas for improvement in the company regarding the selection and removal of unnecessary items. It is necessary to identify specific negative situations and work to correct them to improve the implementation process of the first "S" and achieve even better results in Table 2.

Table 2 - Evaluator description.

Month	S	Evaluator
Feb	100,00%	Evaluator II
Feb	100,00%	Evaluator II
Feb	100,00%	Evaluator II
Feb	100,00%	Evaluator II
Feb	100,00%	Evaluator II
Feb	100,00%	Evaluator II
Feb	80,00%	Evaluator II

Source: Authors, (2023).

Question 3, which is not being executed according to the evaluator's perspective, is an aspect that needs to be carefully evaluated and considered by Bramam Parintins company. It is important to understand the reasons why this question is not being met and take appropriate corrective actions to ensure that all elements of the first "S" (Seiri) of the 5S program are fully implemented.

The overall satisfaction presented by Evaluator 2 can be a positive indication that the company is succeeding in other areas, but the identification of a gap in question 3 should be treated with attention, as presented in Table 3:

Table 3 - Questions asked to employees and answers obtained.

SELECTION				
1	2	3	4	5
Is the cabin free of products, containers and unnecessary items?	Is the vehicle documentation in a suitable location, in a single folder, easily accessible and known to everyone?	Is the cabin upholstery in good condition (no tears or exposed iron)?	Is the tracking device in good condition? (clean, no screen cracks and/or chips)	Are the stalls in good condition (no tears, rust and/or edges)?
OK	OK	OK	OK	OK
OK	OK	OK	OK	OK
OK	OK	OK	OK	OK
OK	OK	OK	OK	OK
OK	OK	OK	OK	OK
OK	OK	NOK	OK	OK

Source: Authors, (2023).

IV.2.2 SEITON

The second "S" of the 5S program is "Seiton," which refers to organization, specifically the efficient and functional organization of necessary items. It is important to remember that the 5S program is a management methodology that seeks to improve organization and cleanliness in the workplace, promoting continuous improvement and efficiency in operations.

According to the tables below: The evaluation by Evaluator 1 showed that Bramam Parintins company achieved a percentage of 80% in the truck's organization stage, indicating a critical assessment regarding the vehicle's organization. This assessment may indicate some negative points in the execution of the second "S" of the 5S program in the company.

Table 4 – Description of the Evaluator.

Month	O	Evaluator
Jan	80,00%	Evaluator I
Jan	80,00%	Evaluator I
Jan	80,00%	Evaluator I
Jan	80,00%	Evaluator I
Jan	80,00%	Evaluator I
Jan	80,00%	Evaluator I
Jan	60,00%	Evaluator I

Source: Authors, (2023).

Table 5 - Questions and answers from the collaborator.

ORGANIZATION				
6	7	8	9	10
Are the notes/receipts organized according to the unit's standard to simplify financial reporting?	Are the chapatex separated in a single bay and organized?	Are the containers separated by type and color in a tower format to facilitate checking?	Are plastics and cardboard segregated in a single bay to simplify disposal?	Are the pallets in good condition (without loose ends and/or broken)?
OK	OK	NOK	OK	OK
OK	OK	OK	NOK	OK
OK	OK	OK	OK	OK
OK	OK	OK	OK	OK
OK	OK	OK	OK	OK
OK	OK	OK	OK	NOK
OK	OK	OK	OK	NOK

Source: Authors, (2023).

The analysis of the critical evaluation by Evaluator 1 was important for implementing corrective actions to improve the organization of the truck, aiming to establish clear organization standards, ensure regular maintenance of organization, and train the employees involved in transport activities to follow established organization practices. The improvement in truck organization can result in greater efficiency in transport operations, reduced workload, and increased customer satisfaction, as we will see in the evaluation by Evaluator II;

Table 6 - Evaluator's Descriptive.

Month	O	Evaluator
Feb	100,00%	Evaluator II
Feb	100,00%	Evaluator II
Feb	100,00%	Evaluator II
Feb	100,00%	Evaluator II
Feb	100,00%	Evaluator II
Feb	100,00%	Evaluator II
Feb	80,00%	Evaluator II

Source: Authors, (2023).

Table 7 - Questions and answers from the collaborator.

ORGANIZATION				
6	7	8	9	10
Are the notes/receipts organized according to the unit's standard to simplify financial reporting?	Are the chapatex separated in a single bay and organized?	Are the containers separated by type and color in a tower format to facilitate checking?	Are plastics and cardboard segregated in a single bay to simplify disposal?	Are the pallets in good condition (without loose ends and/or broken)?
OK	OK	OK	OK	OK
OK	OK	OK	OK	OK
OK	OK	OK	OK	OK
OK	OK	OK	OK	OK
OK	OK	OK	OK	OK

ORGANIZATION				
6	7	8	9	10
Are the notes/receipts organized according to the unit's standard to simplify financial reporting?	Are the chapatex separated in a single bay and organized?	Are the containers separated by type and color in a tower format to facilitate checking?	Are plastics and cardboard segregated in a single bay to simplify disposal?	Are the pallets in good condition (without loose ends and/or broken)?
OK	OK	OK	OK	OK
OK	OK	OK	OK	OK

Source: Authors, (2023).

It is great news that the second evaluation has shown a 100% improvement in almost all areas assessed at Bramam Parintins in relation to the implementation of the second "S" of the 5S program. This indicates that the company has taken corrective measures and implemented actions to improve truck organization and achieve the established objectives.

IV.2.3 SEISO

Among the results obtained in the research, Bramam Parintins achieved 100% compliance in both assessments of the third "S" of the 5S, which is cleanliness. This indicates that the company is committed to maintaining a clean and organized environment in its operations. Maintaining a high level of cleanliness can bring various benefits to the company, such as:

Safe and Healthy Work Environment: Proper cleanliness contributes to the creation of a safe and healthy work environment, reducing the risks of accidents and occupational illnesses.

Operational Efficiency: A clean and organized environment facilitates the identification and access to materials, tools, and information necessary for operational activities, which can result in greater efficiency and productivity.

It is crucial for the company to continue monitoring and maintaining the established cleanliness standards, ensuring that employees are engaged in maintaining the third "S" of the 5S over time. Additionally, it is essential to identify and correct any deviations or opportunities for improvement in the cleanliness area to further enhance practices and results. With a clean and organized environment, the company can promote a safer, more efficient, and positive work environment for everyone involved.

IV.2.4 SEIKETSU

Achieving 100% compliance in both assessments of the fourth "S" of the 5S, which is standardization, demonstrates the company's commitment to maintaining and preserving the resources and assets used in its operations.

Standardization is an important aspect of the 5S program, aiming to promote responsibility and care for the company's resources, including machinery, equipment, tools, materials, and facilities.

IV.2.5 SHITSUKE

In the first assessment of the self-discipline sense of the 5S program at Bramam Parintins, it was identified that the team had low knowledge of the 5S principles and did not remember the main gaps identified. As a result, the utilization percentages remained in the range of 75%.

Self-discipline is one of the fundamental aspects of the 5S program, involving the commitment of employees to maintain established standards, follow procedures, and comply with the rules defined for organizing, cleaning, and preserving the work environment. It is a sense that requires awareness, responsibility, and constant monitoring by the entire team.

Table 8 - Evaluator's Descriptive.

Month	A	Evaluator
Jan	50,00%	Evaluator I
Jan	100,00%	Evaluator I
Jan	75,00%	Evaluator I
Jan	75,00%	Evaluator I
Jan	75,00%	Evaluator I
Jan	75,00%	Evaluator I
Jan	75,00%	Evaluator I

Source: Authors, (2023).

Table 9 - Questions and Responses Given to Employees.

SELF-DISCIPLINE			
14	15	16	17
Does the team know the meaning of the 5S?	Does the team know that there is a monthly audit routine? Do they remember the score from the last audit?	Does the team recall the main GAPs identified?	Does the team know that there is a recognition program for the best 5S Team? Can they explain how the program works and who were the winners last month?
NOK	OK	NOK	OK
OK	OK	OK	OK
OK	OK	NOK	OK
OK	OK	NOK	OK
OK	OK	NOK	OK
OK	OK	NOK	OK
OK	OK	NOK	OK

Source: Authors, (2023).

Over time, self-discipline was gradually incorporated into the organizational culture of the Bramam company, and employees began to understand the importance of following the established procedures of the 5S program to maintain a more organized, clean and efficient work environment.

The change in mindset and the adoption of a more disciplined stance in relation to the 5S program procedures brought positive results, contributing to the continuous improvement of internal processes and obtaining the expected benefits.

When we observe Table 9, we can see a significant improvement from one evaluator to another.

Table 10 - Evaluator's Description.

Month	A	Evaluator
Feb	100,00%	Evaluator II
Feb	100,00%	Evaluator II
Feb	100,00%	Evaluator II
Feb	100,00%	Evaluator II
Feb	100,00%	Evaluator II
Feb	100,00%	Evaluator II
Feb	100,00%	Evaluator II

Source: Authors, (2023).

Table 11 - Questions and Answers Given to Employees.

SELF-DISCIPLINE			
14	15	16	17
Does the team know the meaning of the 5S?	Does the team know that there is a monthly audit routine? Do they remember the score of the last audit?	Does the team remember the main GAPs identified?	Does the team know that there is a recognition program for the best 5S Team? Can they explain how the program works and who were the winners last month?
OK	OK	OK	OK
OK	OK	OK	OK
OK	OK	OK	OK
OK	OK	OK	OK
OK	OK	OK	OK
OK	OK	OK	OK
OK	OK	OK	OK

Source: Authors, (2023).

This is a positive indication that the corrective actions and awareness-raising implemented after the first assessment have had an effect and there has been significant improvement in the team's self-discipline regarding the principles of the 5S program. The 100% improvement in all requirements in the second assessment is a promising result and shows that the team is committed to implementing the 5S, understanding the importance of self-discipline in maintaining the established standards. It's important to recognize and value the efforts and results achieved by the team in this process. The 5S program applied to the trucks of the company Bramam Parintins also presented positive and negative points, which are detailed below:

IV.2.6 Positive Points

1. **Improved Vehicle Maintenance:** Implementing the 5S program in Bramam Parintins' trucks has led to improved vehicle maintenance. By standardizing cleaning, inspection, and preservation procedures for the trucks, it became possible to identify and fix issues more quickly, avoiding unscheduled stops and increasing vehicle availability for operations.

2. **Extended Vehicle Lifespan:** Adopting the 5S program also helped extend the trucks' lifespan. Through regular cleaning, identifying and fixing minor problems before they escalate, and standardizing preventive maintenance procedures, the vehicles' lifespan was prolonged. This reduced costs associated with corrective maintenance and premature part replacement.

IV.2.7 Negative Points

• **Resistance to Change:** As with any improvement program implementation, resistance to change from employees

might have been a negative point in applying the 5S program to Bramam Parintins' trucks. Some employees might have resisted changes in maintenance procedures and routines, resulting in low adherence to the program and compromising its results.

• **Need for Training and Skill Development:** Properly applying the 5S program to the trucks requires training and skill development of the employees responsible for vehicle maintenance. Lack of adequate training might have been a negative point in the program's implementation, leading to failures in procedure application, error in problem identification, and inadequate vehicle preservation.

IV.3 FORKLIFT

The implementation of the 5S program in the forklift sector has shown positive results in the first four S's, which are sense of use, organization, cleanliness, and preservation. However, the last S, which is the sense of self-discipline, has shown percentages below expectations, ranging from 50% to 75% in evaluations.

The first four S's have been well executed, with the team using the forklifts properly, keeping the area organized, clean, and preserved, following the 5S program guidelines. This has contributed to improved efficiency and productivity in the sector, avoiding accidents and damage to the forklifts, ensuring a safer and more efficient work environment.

However, the sense of self-discipline has presented challenges, with utilization percentages below expectations. This may indicate a need to reinforce the culture of discipline and responsibility among forklift operators, as well as the importance of following established procedures and guidelines for proper machine use.

Table 12 - 5S Description in the Forklift Sector.

MÊS	S	O	L	C	A
JAN	100,00%	100,00%	100,00%	100,00%	75,00%
JAN	100,00%	100,00%	100,00%	100,00%	75,00%
FEB	100,00%	100,00%	100,00%	100,00%	100,00%
FEB	100,00%	100,00%	100,00%	100,00%	100,00%
MAR	100,00%	100,00%	100,00%	100,00%	75,00%
MAR	100,00%	100,00%	100,00%	100,00%	50,00%

Source: Authors, (2023).

Table 13 - Questions Asked to Employees.

SELF-DISCIPLINE			
10	11	12	13
O empilhador sabe o significado dos 5S?	Does the forklift operator know that there is a monthly audit routine?	Does he remember the score of the last audit? Does the forklift operator remember the main GAPS identified?	Does the forklift operator know that there is a recognition program for the best 5S Team? Can they explain how the program works and who were the winners last month?
OK	OK	NOK	OK
OK	OK	NOK	OK
OK	OK	OK	OK
OK	OK	OK	OK
OK	OK	OK	NOK
OK	OK	NOK	NOK

Source: Authors, (2023).

It's crucial to identify the causes of this low self-discipline, such as possible gaps in training, lack of operator awareness about the importance of following procedures, or inadequate supervision. Based on this analysis, corrective actions can be taken, such as reinforcing training, establishing clear procedures, creating performance indicators, and strengthening supervision to improve self-discipline in the forklift sector.

The implementation of the 5S program is an ongoing process, and it is vital for the company to maintain constant monitoring of progress, identifying areas for improvement, and acting proactively to address identified weaknesses. With awareness and team engagement, it is possible to overcome the challenges related to self-discipline and achieve positive results in all aspects of the program, contributing to the continuous

improvement of the forklift sector and, consequently, the overall performance of the company.

IV.4 DATA ON PROGRESS

IV.4.1 Warehouse

Periodic evaluations were conducted to measure the progress of the 5S program in the warehouse sector of Bramam company. The results obtained were analyzed and showed positive evolution over the months. In January, the program utilization rate was 49.49%. In February, there was an improvement, with the rate rising to 55.43%. In March, another increase was recorded, reaching a rate of 59.59%. In April, there was a significant increase to 70.92%. In May, there was a continuous increase to 76.99%. As of this June, the rate has increased to 80.33%.



Figure 2 - Descriptive of the 5S in the Warehouse.

Source: Authors, (2023).



Figure 3: Image of the warehouse office before the application of the 5S program.
Source: Authors, (2023).



Figure 4: Images of the warehouse office after the application of the 5S program.
Source: Authors, (2023).

These data highlight the effectiveness of Bramam's improvement project based on the 5S program. Through the implementation of the program's principles, the warehouse sector employees are fostering a cultural shift, adopting habits of use, organization, cleanliness, preservation, and self-discipline in the workplace. These positive outcomes are reflected in a gradual increase in the program's utilization rate, indicating consistent evolution over time.

Furthermore, the development of self-discipline among the employees is promoting greater responsibility and commitment in executing procedures, as well as in maintaining the standards set by the 5S program. This is creating a culture of continuous improvement, where employees are constantly seeking to identify opportunities for enhancement and implement corrective actions.

In summary, the 5S project at Bramam aims to enhance efficiency and organization in the warehouse sector through the implementation of the 5S program principles. The methodology involved raising awareness, training, and sequential implementation of the program's five principles: sense of use, sense of organization, sense of cleanliness, sense of preservation, and sense of self-discipline. The results obtained demonstrate a positive evolution in the program's utilization rates over the months, reflecting benefits for the company in terms of efficiency and quality.



Figure 5: Material storage before the application of the 5S program.
Source: Authors, (2023).



Figure 6: Material storage after the application of the 5S program.
Source: Mendonça (2023).

IV.4.2 Trucks

The results of the evolution of the 5S program sensibilities in Bramam's truck sector showed variation over the months. In January, the utilization rate of the sensibilities was 88.38%, indicating good adherence to the program. In February, there was a significant improvement, with the rate rising to 92.43%, demonstrating positive progress in the practices of use, organization, cleanliness, preservation, and self-discipline in the sector. However, in March, there was a decline, with the rate falling to 90.13%, highlighting the need for corrective actions to maintain consistent evolution over time. In April, the rate was stable at 90.00%. In May, the indicator reached 90.57%. As of this June, it is showing an increased indicator of 92.17%, resulting in efficiency and quality in transport operations.

This variation in the utilization rates of the 5S program sensibilities in the truck sector of Bramam underscores the importance of regular and continuous monitoring of the project. It's essential to identify the causes of the decline in March and implement corrective actions to return to the path of continuous improvement. There might have been deviations in the practices of use, organization, cleanliness, preservation, and self-discipline, or new challenges that impacted the sector's performance.

Given this variation in results, a detailed analysis of the processes and procedures in the truck sector is necessary, identifying potential areas for improvement. It's also important to promote awareness and training activities for the employees, emphasizing the importance of the 5S program principles and encouraging their adoption as a work routine.

Moreover, maintaining clear and transparent communication about the objectives and results of the 5S program in the truck sector is crucial. It's important for employees to

understand the program's significance for the sector's efficient functioning and for achieving the company's overall objectives. Sharing the results obtained, both positive and challenging, can

motivate employees' commitment and engagement in seeking improvements.

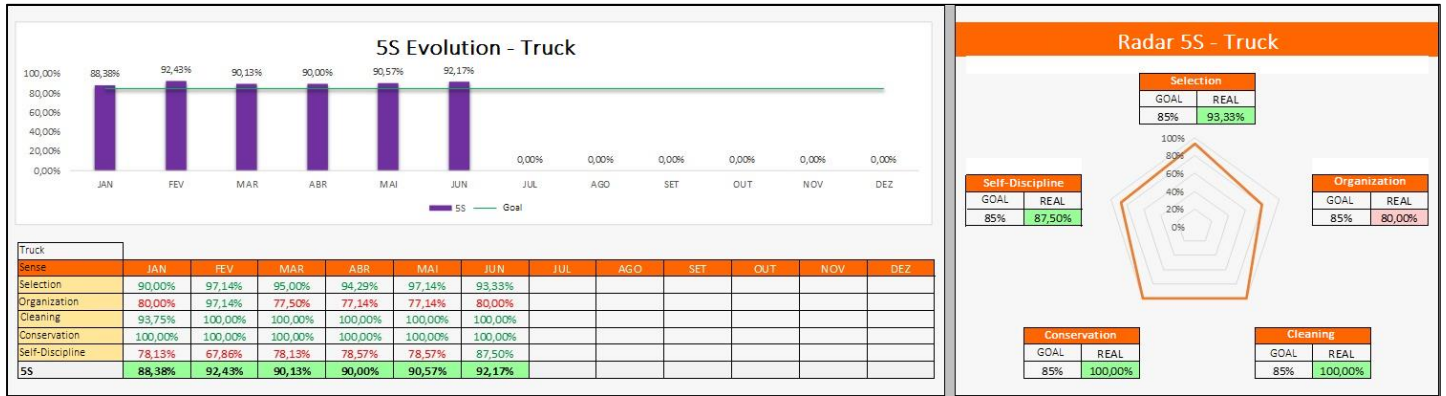


Figure 7- 5S Description on the Truck.
Source: Authors, (2023).



Figure 8: Image of trucks before the application of the 5S program.
Source: Authors, (2023).



Figure 9: Image of trucks after the application of the 5S program.
Source: Authors, (2023).

IV.4.3 Forklift

The results of the evolution of the 5S program sensibilities in Bramam's forklift sector showed variations in the utilization rates over the months. In January, the utilization rate was 95%, indicating good adherence to the program and strong performance in use, organization, cleanliness, preservation, and self-discipline in the sector. In February, there was a significant improvement, with the rate reaching 100%, indicating excellent performance and consistent application of the 5S program principles. However, in March, there was a decline in utilization, with the rate falling to 92.50%, highlighting the need to identify and correct possible deviations in program practices. The rate remained at 92.50% in April, May, and June.

Given these variations in results, a detailed analysis of the processes and procedures in the forklift sector is necessary,

identifying possible causes of the decline in March. There may have been lapses in use, organization, cleanliness, preservation, or self-discipline, or new challenges that impacted the sector's performance.

One strategy to correct possible deviations and promote continuous improvement is to reinforce employee training, with specific focus on the 5S program and its practices. Employees must understand the benefits of the program and how its practices directly impact the efficiency and productivity of the sector.

Another action that can be taken is establishing routines for internal audits to check the application of the 5S program principles in the forklift sector. These audits can be conducted periodically, involving employees and identifying opportunities for improvement. It's crucial that the audits are conducted impartially and that the results are shared transparently with the employees, so that everyone can contribute to identifying solutions.

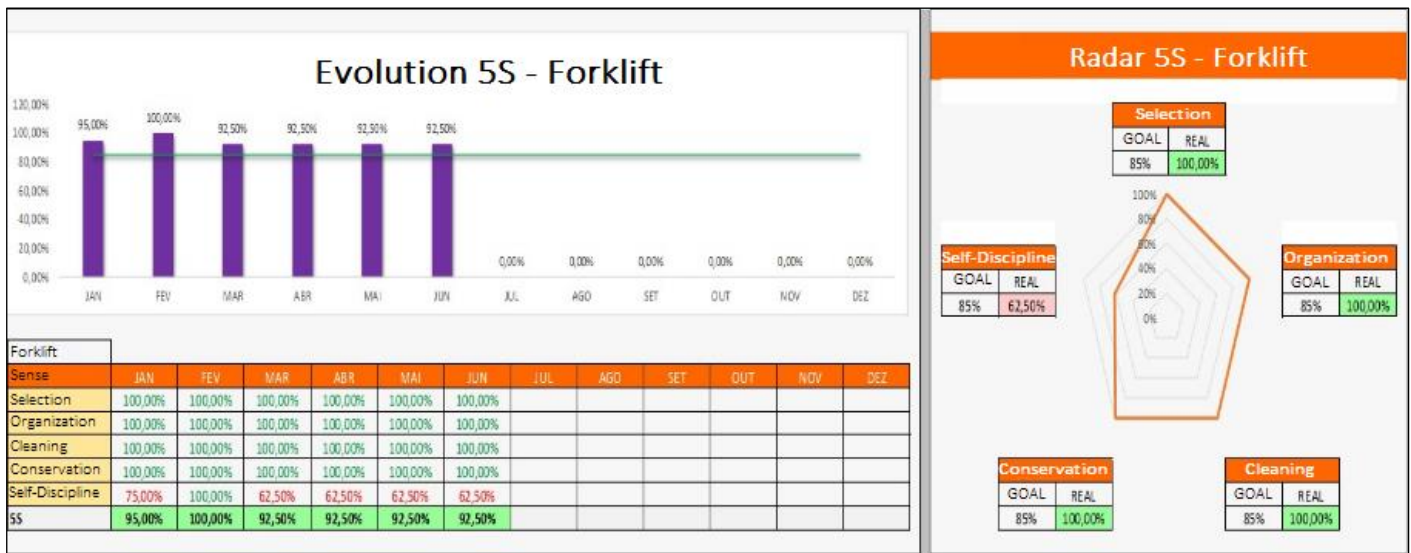


Figure 10 - Description of 5S on the Forklift.
Source: Authors, (2023).



Figure 11: Images of the forklift after the application of the 5S program.
Source: Authors, (2023).

V. CONCLUSIONS

The five principles of the 5S are fundamental for promoting organization, cleanliness, discipline, and continuous improvement in a work environment. The Sense of Use concerns identifying and removing unnecessary items from the workplace. The Sense of Order involves defining appropriate places for each item to

facilitate access and efficient use of resources. The Sense of Cleanliness encompasses maintaining a clean and safe environment, contributing to accident prevention and health promotion. The Sense of Health/Neatness refers to personal hygiene, appropriate clothing, and the health of employees. Finally, the Sense of Self-Discipline is related to maintaining established standards and the constant pursuit of improvement.

The implementation of the 5S in companies can bring various benefits, such as improving the work environment, increasing efficiency and productivity, reducing costs, stimulating a quality culture, and promoting a sense of belonging and responsibility among employees. It's a simple yet effective approach that can be applied in organizations of any size or sector, contributing to the continuous improvement of processes and results.

Based on the analyzed data, it can be concluded that Bramam Parintins has made significant progress in implementing the 5S program in its work environment. The initial assessment showed opportunities for improvement, particularly in self-discipline, where the team achieved a utilization rate of 75%. However, the second assessment revealed an impressive evolution of 100% in all requirements, demonstrating the team's commitment to adopting the program's principles.

The company's effort to promote organization, cleanliness, preservation, and self-discipline in the workplace is noteworthy, aiming to improve efficiency, productivity, and the quality of processes. The positive points identified in the evaluations show that the company is on the right track to achieve operational excellence through the implementation of the 5S.

It is important to emphasize the need to maintain constant monitoring, provide training, and reinforce the culture of continuous improvement to ensure the sustainability of the 5S program over time. It is an ongoing process that requires the engagement of the entire team, from top management to employees at all hierarchical levels.

Based on the obtained results and the positive evolution, Bramam Parintins is on the right path to achieving a more organized, clean, preserved, and disciplined work environment, which can contribute to process optimization, employee satisfaction, and the improvement of the quality of products and services offered.

In summary, the implementation of the 5S program at Bramam Parintins has shown positive results, with advances in self-discipline and the adoption of the program's principles. It is a continuous process that requires monitoring and engagement from the entire team, aiming for continuous improvement and the pursuit of operational excellence.

VI. AUTHOR'S CONTRIBUTION

Conceptualization: Roberta Pontes da Costa, Thiago Mendonça de Souza, Bruna Lorryne Vasconcelos Barros, Vanessa Coelho da Silva, Emanuel Kedson da Silva Freitas and Aderli Vasconcelos Simões.

Methodology: Roberta Pontes da Costa, Thiago Mendonça de Souza, Bruna Lorryne Vasconcelos Barros, Vanessa Coelho da Silva, Emanuel Kedson da Silva Freitas and Aderli Vasconcelos Simões.

Investigation: Roberta Pontes da Costa, Thiago Mendonça de Souza, Bruna Lorryne Vasconcelos Barros, Vanessa Coelho da Silva, Emanuel Kedson da Silva Freitas and Aderli Vasconcelos Simões.

Discussion of results: Roberta Pontes da Costa, Thiago Mendonça de Souza, Bruna Lorryne Vasconcelos Barros, Vanessa Coelho da Silva, Emanuel Kedson da Silva Freitas and Aderli Vasconcelos Simões.

Writing – Original Draft: Roberta Pontes da Costa, Thiago Mendonça de Souza, Bruna Lorryne Vasconcelos Barros, Vanessa Coelho da Silva, Emanuel Kedson da Silva Freitas and Aderli Vasconcelos Simões.

Writing – Review and Editing: Vanessa Coelho da Silva, Emanuel Kedson da Silva Freitas and Aderli Vasconcelos Simões.

Resources: Roberta Pontes da Costa, Thiago Mendonça de Souza and Bruna Lorryne Vasconcelos Barros.

Supervision: Vanessa Coelho da Silva, Emanuel Kedson da Silva Freitas and Aderli Vasconcelos Simões.

Approval of the final text: Roberta Pontes da Costa, Thiago Mendonça de Souza, Bruna Lorryne Vasconcelos Barros, Vanessa Coelho da Silva, Emanuel Kedson da Silva Freitas and Aderli Vasconcelos Simões.

VII. REFERENCES

- [1] LINO, ANDRÉ DA SILVA. Gestão da manutenção. 1994.
- [2] MARSHALL, Island Junior (org). Quality Management. Rio de Janeiro: FGV Publisher, 2003.
- [3] PALADINI, Edson Pacheco. Quality Management: Theory and Practice, 2nd Ed. São Paulo: Atlas, 2004.
- [4] MAXIMIANO, Antonio Cesar Amaru. Introduction to Administration, 4th Ed. São Paulo: Atlas, 1995.
- [5] Werkema, M. C. (2006). Lean Seis Sigma Introdugma: Estratégia gerencial manufacturing. Rio de Janeiro: Wekema.
- [6] GANDRA, Marco Aurélio, et al. 5S Program in the Factory. CEFET-MG. Belo Horizonte - MG, 2006. Available at: [http://www.leadempresarial.com.br/site_lead/imagens_arquivos/academica/Programa%205S%20na%20Fabrica.pdf].
- [7] BENEMANN, Raphael Roveda. Considerations on the Use of the 5S Program. Available at: [http://www.cyber7.com.br/index.php/artigos/18-consideracoes-sobre-a-utilizacao-do-programa-5s]. Accessed in: Oct. 2012.
- [8] BREKAILO, Fernanda; MUGNAINE, Michele; PEREIRA, Alan W; KUGLER, Bruno Hermannus; BRODAY, Evandro E. Theoretical Implementation of the 5S Program in the material transformation center of UTFPR. Salvador-BA. Available at: [https://abepro.org.br/biblioteca/enegep2013_TN_STO_178_019_21900.pdf].
- [9] CANTO, Liliam Caroline Cardoso, et al. Implementation of the 5S System in the Storage Sector of a Small Company in Southern Santa Catarina. In: XXVI National Meeting of Production Engineering, 2006.
- [10] ZANINI, Edinilson. The Importance of 5S for Companies. Available at: [http://www.edigital.com.br/index.php?option=com_content&view=article&id=113:a-importancia-do-5s-para-as-empresas&catid=31:gestao&Itemid=46]. Accessed in: Oct. 2012.
- [11] ISOFLEX, 2023. Available at: [https://isoflex.com.br/wp-content/uploads/2019/10/5s.jpg].
- [12] Stank, TP, Daugherty, PJ e Ellinger, AE (1999). Integração marketing/logística e desempenho da empresa. O Jornal Internacional de Gestão Logística , 10 (1), 11-24.
- [13] Novaes, A. G. (1989). Sistemas logísticos: transporte, armazenagem e distribuição física de produtos.
- [14] Figueiredo, K., & Arkader, R. (1998). Da distribuição física ao supply chain management: o pensamento, o ensino e as necessidades de capacitação em logística. Revista Tecnológica, 33, 16.
- [15] Christopher, M. e Peck, H. (1997). Gestão da logística nos mercados de moda. O Jornal Internacional de Gestão Logística , 8 (2), 63-74.
- [16] PRODANOV, C.C.; FREITAS, E.C. Scientific Work Methodology: Methods and Techniques of Research and Academic Work. 2nd ed. Novo Hamburgo: Feevale, 2013.
- [17] GERHARDT, T.E.; SILVEIRA, D.T. Research Methods. Porto Alegre: UFRGS Publisher, 2009.