ISBN: 978-628-96613-1-6. ISSN: 2414-6390. Digital Object Identifier: https://dx.doi.org/10.18687/LACCEI2025.1.1.587

Diagnosis and proposal for improvement in the spare parts marketing process in a company in the automotive sector, using Lean Logistics tools

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Abstract–This research project focuses on optimizing a company's logistics processes with the aim of improving efficiency and effectiveness. Through a detailed analysis of the company's current situation, the main areas of opportunity in inventory management, storage, and purchasing planning were identified. To address these challenges, the implementation of Lean Manufacturing tools such as 5S, Kanban, and Visual Management was proposed. These tools have improved warehouse organization, reduced waste, and increased process visibility. Additionally, a cost-benefit analysis demonstrated the economic feasibility of the proposal, with an internal rate of return significantly higher than the cost of capital. The study concluded that the application of these Lean tools in the company's logistics processes can generate significant improvements in terms of efficiency, cost reduction, and customer satisfaction. The results obtained offer a practical guide for other companies seeking to optimize their logistics operations and increase their competitiveness in the market.

Keywords—Automotive sector, Process improvement, Lean, Lean Logistics

I. INTRODUCTION

Globally, the automotive sector is experiencing a decline in production of vehicles due to the shortage of some products caused due to the war between the countries of Ukraine and Russia. Likewise, you must add the impact of the pandemic. Despite this impact, China remains the country with greater profit and market, with more than 23 million units sold; followed by the United States, which presents an increase of 16.55%, compared to as of August 2022, showing a direct relationship with the number of registered vehicles, due to their economy and the society in which they live its habitants, showing their good standard of living. Meanwhile, in Peru, the Imports of cars and trucks decreased by 40% to 27% respectively during 2020; However, in the following year, it was possible evidence a positive trend in this sector, since they increased imports of cars and trucks by 26% and 66% respectively. The sale of vehicles in the Peruvian market continues to show a growth, registering a 12.5% increase so far in 2023 compared to the previous period, positioning it as one of the countries in Latin America with the greatest growth.

The company analyzed is one of the main concessionaires of one of the most recognized vehicle brands in Peru, with a long history in the automotive sector, and offers various services such as workshop service, counter service and after-sales service. Historically, the company has a active market share throughout the country, which represents 20% in the unit sales of the Toyota brand, making it the second largest distributor; However, the company is leading the purchase and sale of spare parts and accessories, due to an increase in workshop attention by 10% compared to the previous year; That is, currently has an average of 3 thousand monthly services, and this presents a margin average gross between 30% and 35% depending on the spare part to be used 4. His hard work in this sector has led to expansions in different districts of Lima, managing to have its last supply hneadquarters in 2023. However, the aforementioned growth in being able to have more stock of merchandise at these headquarters has caused some failures in the company's activities, mainly in the logistics area.

To have a good process for dispatching merchandise to the customer, it is necessary to have a warehouse in the correct condition, where cleanliness and order are important factors. Likewise, proper purchasing planning is required. stock, to be able to obtain a good level of fill rate towards the client. First Firstly, in the last month of 2021, the warehouse under analysis presented a sales billing at the end of the year of 983,115 thousand soles with a margin of 18%, while in the month of July 2022, the warehouse presented a billing sales of 1,324,339 thousand soles with a margin of 15%, which indicates that there was a decrease in gain, compared to the 2 months with maximum activity in the Peruvian market, which in turn implies that there is no was able to meet the managerial objective of being able to exceed this first goal, although it had a higher turnover. Secondly, due to the increase in the purchase and sale of spare parts and accessories, there is an increase in inventory from 23,689 units with a cost of 1,877 thousand soles to 31,208 units with a cost of 3,313,432 thousand soles; but it is also due to the inefficient stock replacements in the different stores, which means that transfer missing and/or surplus spare parts and accessories to the warehouse central, generating unnecessary transfers, a difficult location of spare parts for your next supplies, disorder due to lack of pallets in the precise moment when large

merchandise is received without prior notice, which generates a increase in operating expenses in the logistics area.

It will be proposed to solve the problem described using the methodology Lean Logistics; since it seeks to improve the productivity and quality of the attention in the warehouse by making better use of time, materials, labor direct and indirect work.

II. LITERATURE REVIEW

The automotive industry, characterized by its intricate global supply chains and high-volume production, has increasingly embraced Lean principles to enhance efficiency, reduce costs, and improve overall performance. Lean Logistics, a subset of Lean manufacturing, is specifically focused on optimizing the flow of materials and information within the supply chain, eliminating waste, and delivering exceptional value to the customer. This theoretical framework delves into the foundational concepts of Lean Logistics, its applications within the automotive sector in many recent investigations as [1] , [2] or [3] and the multifaceted benefits it offers.

Lean manufacturing, pioneered by Toyota, places paramount importance on identifying and eliminating waste in all processes. The seven commonly targeted wastes encompass overproduction, inventory, defects, waiting, transportation, motion, and over-processing. Lean Logistics applications as in [4] extends these principles to the broader supply chain, emphasizing the optimization of material and information flows from suppliers to end customers. Key concepts within Lean Logistics include value stream mapping, Just-in-Time (JIT) production, SMED, pull systems, and 5S.

The automotive industry, given its extended and complex supply chains, is particularly well-suited for the implementation of Lean Logistics. By adopting Lean principles, automotive manufacturers can achieve substantial benefits, including notable cost reductions, enhanced product quality as in [5] , increased flexibility and agility in operations as in [6] , improve working conditions as in [7] and elevated customer satisfaction. Specific examples of Lean Logistics implementation in the automotive industry include the Toyota Production System (TPS), Kanban systems, and Vendor Managed Inventory (VMI).

While the advantages of Lean Logistics are manifold, organizations may encounter certain challenges during implementation. These challenges include resistance to change, substantial upfront investments, the complexity of managing intricate supply chains, and the difficulty of accurately measuring the success of Lean Logistics initiatives as can be seen in [8]. Lean Logistics presents a robust framework for optimizing supply chains within the automotive industry with the proper practices as in [9]. By prioritizing waste elimination, flow improvement, and customer value delivery, automotive manufacturers can achieve significant advancements in cost, quality, and flexibility. However, successful implementation hinges on unwavering commitment from leadership, active employee engagement, and an unwavering focus on continuous improvement.

To fully realize the potential of Lean Logistics, it is essential to delve deeper into specific Lean tools and techniques. Moreover, exploring the role of technology, such as IoT, big data, predictive analytics and industry 4.0 as in[10] or [11], in the context of Lean in the automotive sector is crucial. Additionally, investigating the impact of globalization on Lean supply chains provides valuable insights for the automotive industry.

In the context of the automotive industry, Lean Logistics has been instrumental in driving innovation and sustainability. For instance, SMED use in [12] or [13] are successful Lean Logistics implementation in the automotive industry. Moreover, the rise of electric vehicles and autonomous driving has further emphasized the need for efficient and flexible supply chains, making Lean Logistics even more relevant.

While the benefits of Lean Logistics are evident, challenges remain. The increasing complexity of automotive supply chains, driven by factors such as globalization and the proliferation of electric vehicles, requires a more holistic approach to Lean implementation. Additionally, the integration of emerging technologies with traditional Lean practices presents both opportunities and challenges.

In conclusion, Lean Logistics offers a transformative approach to supply chain management in the automotive sector. By systematically addressing waste and optimizing processes, automotive manufacturers can gain a competitive edge, enhance customer satisfaction, and drive long-term sustainability. However, successful implementation requires a comprehensive understanding of the underlying principles, a commitment to continuous improvement, and a willingness to adapt to evolving industry dynamics.

III. DIAGNOSIS

The company is an official Toyota dealer, with more than 50 years in the Peruvian market, which provides services to the automotive sector from its various locations in the Lima region, where the Toyota and Hino brands are sold, for cars and trucks respectively. According to the International Standard Industrial Classification (CIUU) given by SUNAT, the company develops three different activities: Sale of motor vehicles (4510); Maintenance and repair of motor vehicles (4520); and Sales of parts, pieces and accessories for motor vehicles (4530). The company's business line is the process of selling Toyota brand vehicles, in addition to offering three services, which are: by workshop, by counter and after-sales.

The company's processes have been identified which allow its compliance and development of activities correctly, which have been divided into visional, operational and support. From this, a prioritization matrix is made based on the following criteria, which resulted in the macro process to be evaluated being Logistics management of spare parts.

• Sales level
• Impact of company costs
• Impact on the quality of products and services
• Impact on service time
• Process safety

Following this, the second prioritization matrix will be carried out to identify the main process, which had the following criteria, and resulted in the process to be evaluated being Entry and storage.

• Product stock
• Delivery times
• Level of efficiency in warehouse operations
• Impact of warehouse costs
• Impact of merchandise costs.
• Impact on product quality.

Based on the activities of the identified process, indicators were proposed according to the activities respectively, where priority will be given to those that present a bottleneck. For example, in Figure 1 you can see the indicator sheet, Transfer of merchandise between locations, which is documented under historical values, in addition to analyzing the deviations it presents according to the target value that is expected to be obtained under a maximum and minimum range; this will reflect the existence of problems to improve.

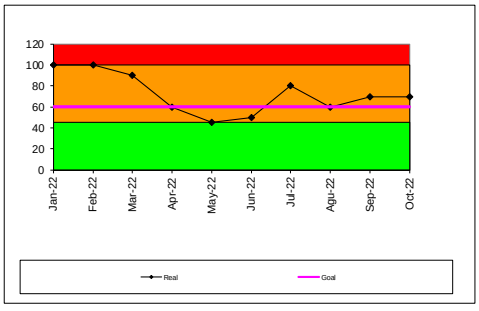
Indicator sheet:

I1.a Transfer of merchandise between locations

General definitions

Formula:	Actual average transfer time between headquartes in minutes				
Reponsaible:	Warehouse manager	**Type**	D	**Unit**	Minutes
Source	Merchandise transfers - Transfer guide that includes the type of merchandise, quantity, and the adress of the headquarters from which it leaves and where it is going.				
Measurement frequency	Monthly	**Oportunity**		Last useful day	
Glosaary	Transfers: Movement of merchandise between headquaters				

Specific definitions



Main series				
Date	Real	Goal	Green	Red
Jan-22	100.0	60.0	45.0	100.0
Feb-22	100.0	60.0	45.0	100.0
Mar-22	90.0	60.0	45.0	100.0
Apr-22	60.0	60.0	45.0	100.0
May-22	45.0	60.0	45.0	100.0
Jun-22	50.0	60.0	45.0	100.0
Jul-22	80.0	60.0	45.0	100.0
Agu-22	60.0	60.0	45.0	100.0
Sep-22	70.0	60.0	45.0	100.0
Oct-22	70.0	60.0	45.0	100.0

Fig. 1 Indicator sheet for the transfer of merchandise between headquarters

Once all the problems were analyzed, they were synthesized to identify the critical problems according to the frequency of incidence in the year and impact; and later order them to make the Pareto diagram and can be seen in Table I and Figure 2.

TABLE I
KEY PROCESS SELECTION CRITERIA

N°	INDICATOR	PROBLEM	IMPACT FREQUENCY	CUMULATIVE PERCENTAGE
N°6	Sementral Audit = Score of 100% on the 5S point of the semester audit	Warehouse disorganization	3035000	**53.73%**
N°9	Locations not created = [(Total merchandise without location)/(Total locations created)]*100	Merchandise without location	757427	**67.14%**
N°11	Months of stock = [(Invoicing from the previous month)/(Cost of merchandise)]*100	High value of merchandise stored	484162	**75.71%**
N°10	Scrap = [(Inventory value of obsolete products)/(Total inventory value)]*100	High value of merchandise stored without much rotation	357882	**82.05%**
N°1	Number of pallets = Number of Purchase Orders to the pallet supplier made out of date.	Merchandise is placed on the floor when there aren´t enought pallets in the warehouse	323000	87.77%
N°7	Transfer of merchandise = Time for transferring products between warehouses	High waiting time for a transfer between locations.	322720	93.48%
N°2	Back Order = [(Total outdated SKUs)/(Total SKUs in BO)]*100	Don´t having visibility of the merchandise pending attention, since they are ordered by import, that is, with a longer lead time.	188352	96.81%
N°5	Open Sales Orden = [(Total Open Purchase Orders)/(Total Purchase Orders issued)]*100	Don´t having visibility of the available stock generating errors in purchasing planning.	66150	97.98%
N°3	ERI = [(Virtual stock cost-Physical stock cost)/(Virtual stock stock)]*100	Warehouse disorganization	60000	99.05%
N°4	Utilization=[(Used capacity)/(Available capacity)]*100	Don´t having visibility of which spaces are free to store	43200	99.81%
N°8	IG Ratio=[(Absolute value of the inventory adjustment)/(Invoicing since the last general inventory of the warehouse)]*100	Discrepancy of actual stock in warehouse	10650	100.00%

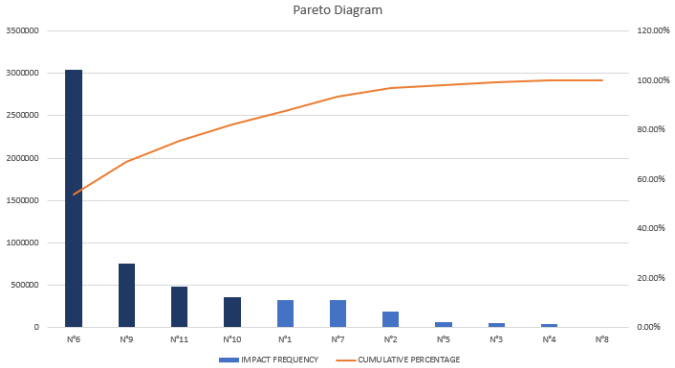


Fig. 2 Pareto diagram

The main problems to be evaluated are Disorganization of the warehouse, Merchandise without location, High value of merchandise stored and High value of merchandise stored without much rotation, in other words, 80% of the consequences are due to 20% of the causes; Therefore, the next steps will be to use the Ishikawa Diagram and a 5W analysis to identify the causes and subsequently the root causes respectively. In Figure 3, one of the analyzes is shown under the Ishikawa Diagram according to the problem with the greatest impact (Warehouse disorganization) and then in Figure 4, the analysis of the 5Ws, with the most relevant cause (Requesting the purchase of a product without prior analysis).

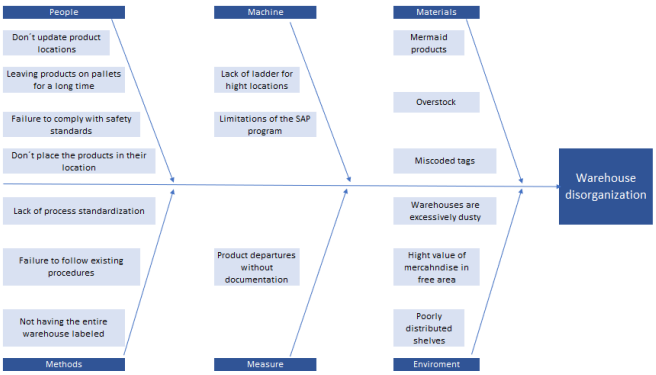


Fig. 3 Cause-effect analysis of problem 1

Requesting the purchase of a product without prior analysis	
1° WHY	They don´t follow the existing procedures in the logistics area
2° WHY	Commercial advisors want to close their Sales Orders before the billing process
3° WHY	Commercial advisors inform the warehouse staff to make the purchase
4° WHY	Commercial advisor think that there isn´t enought stock for their Sales Orders
5° WHY	**Warehouse staff are delayed in entering the merchandise, and commercial advisors can´t invoice their Sales Orders, causing delays in dispatch.**

Fig. 4 Methodology 5 why of cause 1

Finally, to select the most efficient countermeasure tool, alternatives will be considered according to each root cause identified, to evaluate and prioritize the correct option for the development of the most viable improvement proposal with the help of the FACTIS matrix. Three tools were proposed to evaluate, which are: Lean Tools, Automation Tool (RFID) and Automation Tool (Label); The first being the chosen one, since it covers greater results to the respective countermeasures since it gives greater emphasis on the correction of operational activities and the improvement of processes, with a greater improvement in quality, due to its ease of implementation and a medium investment. required.

IV. IMPROVEMENT PROPOSAL

The three countermeasures that will be sought to be resolved in the investigation are the following:

- Design a distribution map of work areas within the warehouse, so that they can perform more efficient work.
- Implement a work board which represents the status of attention of the Sales Orders to be picked.
- Implement inventory control indicators that show visibility to the warehouse team about the situation of their stock in real time.

A. Lean Tool Selection

As a first step to implement the improvement proposal, it will be to identify the bottleneck activities with the help of the VSM analysis and the Tack Time value, resulting in the activities of reception, identification and storage of merchandise. In Figure 5, the VSM AS IS Diagram is seen, and in Figure 6, the cycle time bar graph.

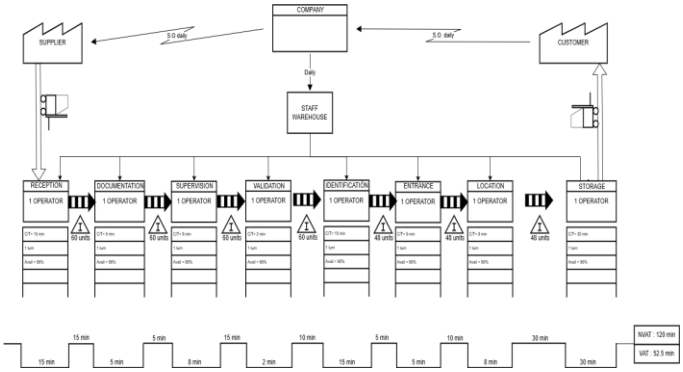


Fig. 5 Value Stream Mapping AS IS Diagram

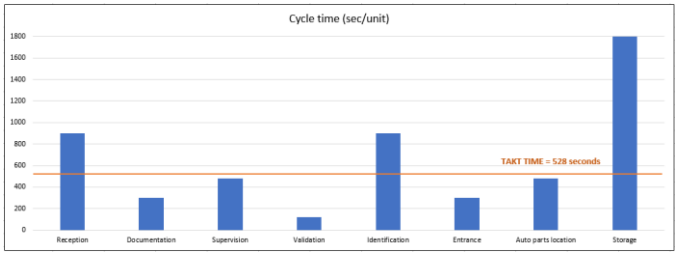


Fig. 6 Bar graph of Cycle Time (sec/unit)

Following this, the most efficient and effective Lean tool will be selected under a prioritization matrix taking into account the four wastes it presents according to the previously chosen process: waiting time, over-processing, excess inventory and unnecessary movements; The result is that the tools to be developed will be the 5S tool, Pull and Kanban System, and Visual Management.

B. Lean tools application

The first tool to be developed will be 5S since its objective is the organization, order and cleanliness of the workplace, and thus be able to obtain better productivity from the staff, eliminating waste and providing quality in the products.

The implementation of the tool will begin with the first S, Seiri – Classification, with the application of red cards in order to identify and mark the existence of unnecessary elements which will be placed in the work areas of the warehouse, and then list them and have visibility of their management such as eliminating, sorting, recycling, among others. Figure 7 shows the red card and the fields to fill in according to each work area.

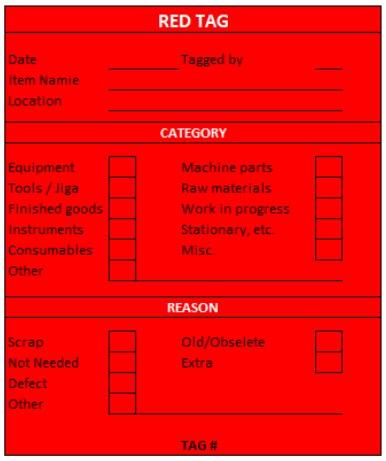


Fig. 7 Red card for the application of Seiri

Followed with the second S, Seiton – Sort, we will begin with the demarcation of all the work areas of the warehouse, either inside and outside, in addition to marking objects such as racks and norem (product identification labels) in visible areas and in high places. Figure 8 shows the demarcation of the warehouse in yellow, and with a width of 7 cm on the edge of each of them.

Fig. 8 Interior warehouse demarcation

Continue with the third S, Seiso – Clean, with a deep cleaning of the warehouse, on the outside and inside, and establish a frequency for this; in addition, providing maintenance and a cleaning manual, finally, a daily program under a responsible staff in order to encourage the habit among collaborators.

Then with the fourth S, Seiketsu – Standardize, the IPER matrix and the risk map will be prepared in order to identify hazards and evaluate the associated risks with the help of the Occupational Health and Safety team, which will help with the preparation. of security actions. Figure 9 shows the risk map in the warehouse.

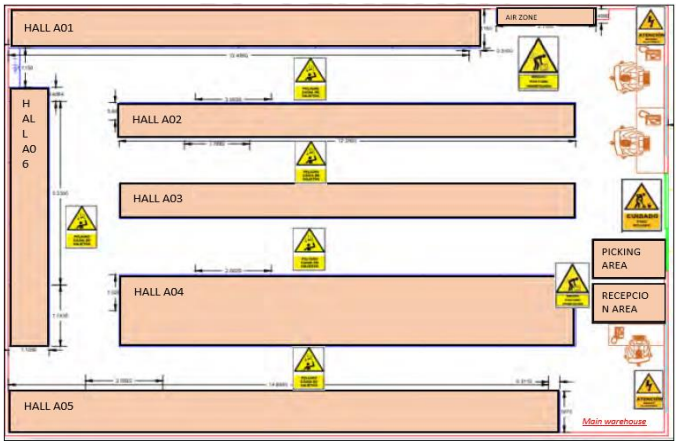


Fig. 9 Risk map of the current situation of the interior warehouse

Finally, with the fifth S, Shitzuke – Discipline, the initiative will be sought to propose permanent work, participate in training and compliance with audits to have visibility that corrective actions are being carried out, showing leadership on the part of the organization's collaborators and comply with all standardized policies and standards. The cleaning

The benefits of the implementation of 5S start from improving the work environment with order, since 2 work areas will be relocated to the outside of the warehouse to facilitate the activities of receiving and picking merchandise. In Figure 10 the risk map of the final situation of the warehouse and in Figure 11, the new space in the external warehouse can be visualized. In addition, you will have time savings in the 3 main processes that presented bottlenecks of up to 35.5 minutes. Additionally, the return of merchandise that was in poor condition due to excess dust will be reduced. Also, there will be a release of workload in order to reduce medical breaks and high staff turnover. Finally, improve the condition of the materials and obtain new ones from them, providing greater care to all the products in the warehouse.

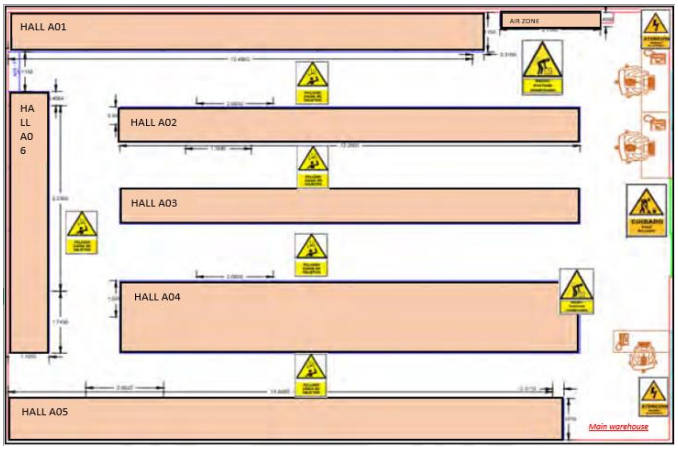


Fig. 10 Risk map of the final situation of the interior warehouse

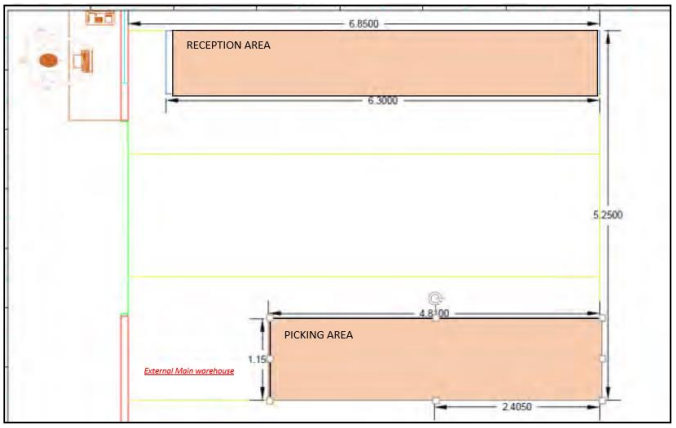


Fig. 11 Risk map of the final situation of the external warehouse

The second tool to be developed will be Kanban since its objective is to guarantee the execution of planned tasks and activities effectively. The current situation is that there is only one document organizer to be able to file the attention of Sales Orders by sellers; However, this presents a disorder in the attention on the part of the warehouse since they do not follow the correct procedures due to the existence of an accumulation of merchandise, delays in attention from the Sales Dealer or/and other suppliers, large volume of documentation, errors in typing, shipping errors, among others; Therefore, the status of each Sales Order cannot be recognized in order to provide complete and correct service, and this leads to forgetfulness or dispatch errors, which can generate problems for the advisor and ultimately for the client.

The implementation of the Kanban will be "By order", since the activity will consist of monitoring the dispatch process of the Sales Order, therefore it will begin by establishing the scope that will be had and prerequisites and restrictions will be proposed, for example: “Indicate the type of attention of the Sales Order, such as office at headquarters, or home, or agency.” Then, the levels that will be managed will be established and the status of dispatch attention to the warehouse will be established, such as: Open, Closed, Stock Pending and Advisory Pending.

Figure 12 shows the Kanban card prototype that will be made so that it can be placed on the Kanban monitoring board and thus have visibility of the process, and will consist of the following information:

- Sales Order Number
- Name of the advisor who opened the Sales Order
- Order status
- Pending the attention of the Sales Order
- Comments

KANBAN CARD	
# Sales Order	
Advisor	
Pending the attention of the Sales Order	
YES	NO
Pending	
STOCK	ADVISOR
Comments	

Fig. 12 Kanban card prototype

Having the Kanban card, the Kanban board will be created, establishing the respective colors for monitoring according to each status mentioned above. In Figure 13, you can see the Kanban board prototype in which the warehouse staff must place the Kanban cards according to what has been completed under the information of a Sales Order and thus have follow-up in case they have any pending issues. attention.

KANBAN BOARD			
OPEN	STOCK PENDING	ADVISOR PENDING	CLOSED

Fig. 13 Kanban board prototype

The benefits of implementing the Kanban tool start from reducing the workload on warehouse staff, since they will have an orderly follow-up. In addition, the time and errors in dispatching the Sales Order will be reduced because you will have greater visibility of what is missing if applicable, and thus avoid duplication or shortages in orders, obtaining monthly savings of up to 300 soles.

The third and last tool to be developed will be Visual Management since its objective is to identify relevant information in visual signals that are carried out in the activities carried out within the company. Many of the indicators that are developed and proposed are not visualized

by the warehouse staff because they do not have a continuous review due to not having the time and/or capacity to organize the information on a daily basis. For example, an indicator, Months of Stock, was proposed to track high, medium and low turnover merchandise, so that warehouse personnel can recognize what is most convenient for the dispatch of merchandise to avoid unnecessary purchases, and perform more efficient activities such as transfers between warehouses. La implementación de esta herramienta empezará con la recopilación de datos obtenido del software SAP Business One, para luego poder consolidar toda la información necesaria en *querys* de trabajo y explotarlos en archivos Excel. Se planteará indicadores para tener un control interno entre los colaboradores y se actualice diariamente:

- Top sales by SKU code
- Stock by headquarters
- Stock by Item Group
- Stock in obsolescence per warehouse
- Stock by warehouse number and headquarters
- Cost and Margin
- Billing by location

In Figure 14, you can see the execution of a dashboard with graphics and interactive information, according to the needs of each collaborator under their daily activities in order to know the movements of the company and keep track of their goals established monthly and so on. can improve their results.

Fig. 14 Storage and Classification Dashboard

The benefits of implementing the Visual Management tool will help us make quick decisions since we will have visibility into the business. In the case of logistics, it will seek to improve its inventory management with merchandise with greater turnover and avoid future scrap products; Likewise, you can have synergies with other areas such as sales, to promote sales campaigns when there is high demand for a product. With this, there will be savings in daily stock purchases since it will be done correctly of up to 750 soles; and thus, improve sales to customers, since there will be no lost sales due to lack of stock.

C. Lean Tool Results

After the proposed tools, the VSM TO BE diagram can be seen in Figure 15, which has the improvements and reduction in time in the process of entry and storage of the merchandise to 52.5 minutes, for which the Takt Time analysis, and in Figure 16, it can be seen that now the activities that presented a bottleneck now have the correct cycle time.

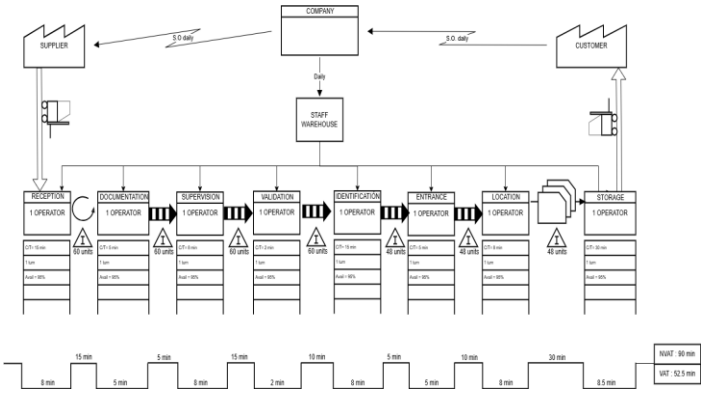


Fig. 15 Value Stream Mapping TO BE Diagram

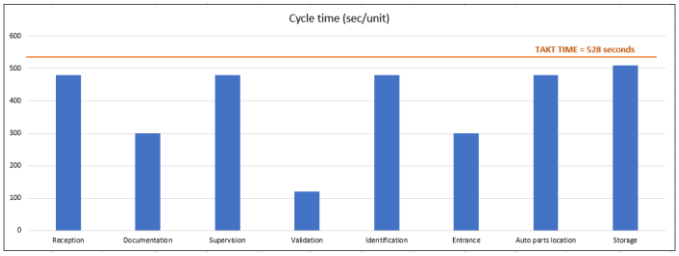


Fig. 16 Bar graph of Cycle Time (sec/unit)

The implementation of the 3 tools will be developed for 6 months, where the 5S tool will have a development period of 5 months, the Kanban tool for 2 and a half months, and finally the Visual Management tool for 1 and a half months. In Figure 17, the schedule can be viewed in detail.

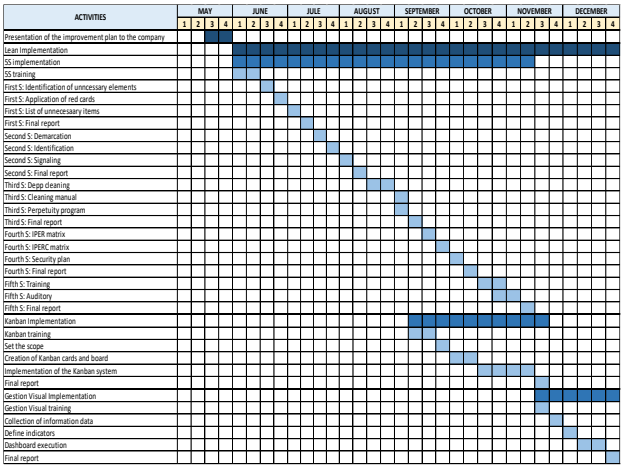


Fig. 17 Lean tools implementation schedule

V. RESULTS

In this section, the technical and economic evaluation of the improvement proposals defined in the previous chapter will be carried out.

A. Technical evaluation

It begins with the technical evaluation which is based on all the savings that the 3 tools mentioned above will generate, for example: savings in returning merchandise, correct replacement purchases, savings in space within the warehouse, reduction in reprocessing of activities, decrease in spare parts obsolescence, increase in sales due to campaigns, among others.

In Table II, it can be seen that there will be a saving of S/ 72, 389.16, of which the 5S tool represents the greatest savings with 73.39%, followed by Visual Management with 13.84%, and finally Kanban with 12.76 %

TABLE II
TOTAL BENEFITS IN SOLES

Development of the Improvement Project	Total Benefit	% Savings
5S	S/ 53,129.93	73.39%
Kanban	S/ 10,020.23	13.87%
Visual Management	S/ 9,239.23	12.76%
Total	S/ 72,389.16	100.00%

B. Economic evaluation

To conclude, the economic evaluation is based on all the costs involved in the development of the 3 tools, from training to all the personnel involved, the costs of each methodology, and monitoring and control costs.

In Table III, it can be seen that the total costs are S/ 78,036.29, of which the 5S tool represents the highest cost with 69.51%, followed by Visual Management with 11.66%, then Kanban with 11.56%, and finally the Project Start cost with 7.26%

TABLE III
TOTAL COSTS OF THE IMPROVEMENT PROJECT TRAINING

Development of the Improvement Project	Total Benefit	% Savings
5S	S/ 54,243.50	69.51%
Gestión Visual	S/ 9,100.97	11.66%
Kanban	S/ 9,022.97	11.56%
Project start cost	S/ 5,669.05	7.26%
Total	S/ 78,036.29	100.00%

Having the income (savings) and expenses (costs) data, the cash flow is carried out to evaluate if the project is viable and profitable. In Table VI, you can see the result of the 3 economic indicators, which presents favorable values since the NPV value is positive, the IRR value is greater than the COK, and the benefit-cost ratio is greater than 1. This tells us that the project is viable.

TABLE VI
ECONOMIC INDICATORS

NPV	S/ 24, 513.50
IRR	38.84%
B/C	1.22

VI. CONCLUSIONS

For the automotive company, which seeks to lead the sale of Toyota brand spare parts in the Peruvian market by providing quality and excellent service, it will seek to improve its logistics processes, from the purchase of spare parts replacement to the dispatch of what the customer requires, For this reason, internal processes must be improved, especially those that present bottlenecks (Receipt of merchandise, Identification of Purchase Order in SAP, Storage of merchandise) therefore, by implementing the proposed tools, it can be reduced to 35.5 minutes of value-added time, which represents 40.34% of the total.

The order of application of the tools is a key factor for the benefits of the project, since the 5S tool seeks to create an organized, orderly, clean and safe work environment to be able to continue with the other tools; For this reason, the Kanban tool is continued to create new procedures and work in a standardized and orderly manner; Finally, apply the Visual Management tool, which will help us to have greater monitoring of logistical and commercial indicators, and to make decisions in the short and/or medium term. All of this will generate a great impact of the benefits generated within the improvement project with 42% in the merchandise Entry and Storage process.

Finally, within the warehouse, one of the most difficult indicators to maintain is the low volume of scrap products, that is, low turnover, which leads to higher storage costs, with the help of the Visual Management tool. will have a 9% decrease in these products, obtaining one of the lowest percentages that the company has had since 2019.

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