

Service model based on Lean Service: Standardized Work and 5S to increase customer satisfaction in a veterinary SME

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Abstract— Companies in the veterinary services sector face the challenge of providing optimal customer service. This sector contributes 40% of the national Gross domestic product and concentrates 48% of formal employment. Considering that, customer satisfaction is one of the key factors to achieve reliable results in our organizations. The low level of this was identified as one of the main problems of the sector, which may be due to different inefficiencies such as low service quality, unsatisfied demand, extended service times and long waits. In this way, a model based on the Lean methodology and the application of 5S tools and standardized work was developed to increase customer satisfaction. It was validated by conducting a case study in a company in the sector located in the Peruvian province of Callao. The results showed an increase in workers efficiency to 90%, a 4.8" decrease in tools searching time and a 25% increase in the Net Promoter Score.

Keywords— Lean Service, 5S, Customer satisfaction level, Standardized Work Model, Service Model.

I. INTRODUCTION

In Peru, the service sector generates a total of more than 1.6 million formal jobs and was unfortunately one of the most affected during the COVID pandemic. In addition, it contributes 40% of Gross domestic product and concentrates 48% of formal employment [1]. However, only 1% of service enterprises in the country have systems that manage quality, which directly affects customer satisfaction [2].

As for the veterinary service sector, 60% of urban households nationwide own at least one pet, in the cities of the interior of the country the tenure is a little higher (62%) while in Lima it is 67% [3]. The continuous growth of the sector brings with it challenges to meet the new needs of customers seeking to obtain a quality service. Considering that customer satisfaction is one of the key factors to achieve satisfactory results in our organizations [4]. Its low level was identified as one of the main problems of the sector, which may be due to different inefficiencies such as poor-quality service, poor staff service, long waiting times and lack of organization of the services provided.

This problem has been identified in different countries, for example, an experimental study was carried out at the Hospital of the Yenepoya Medical College, Mangalore. The

effectiveness of the 5S techniques was proven in an improvement in the biomedical engineering department that was reflected in the fact that the audit score had increased from 31.79% to 91.794%. [5] Research focused on a group of hospitals in Malaysia identified that they did not have standardized processes, so there were waste and long waiting times in care processes [6]. Following this same line, A case study was developed in an IoT solutions provider located in Brazil, and it was able to demonstrate how the implementation of Lean principles, techniques and tools can bring benefits to the Operations department in reducing waiting times [7].

In this context, it is necessary for Peruvian veterinarians to be more efficient when it comes to satisfying customers' needs.

Having recognized the importance of solving this problem, a case study was analyzed, it reflects the sector's low level of customer satisfaction due to different causes such as lack of focus on the customer, problems of identification of demand, absence of an organizational strategy, lack of standardization of processes and lack of staff training.

In this sense, to solve the problem, an improvement model was developed combining 5S tools and standardized work all under the Lean Service methodology.

To publicize the proposal, this academic article has been divided into the following sections: State of the Art, where problem background will be presented from approaches of different authors; Contribution, explaining the theoretical basis of the model and describing the proposed model with its respective indicators; Validation, describing outcomes before intervention, implementation of pilots and simulation, and outcomes after intervention; Discussion and Conclusions.

II. STATE OF THE ART

A. Service Management Model to increase customer satisfaction levels

Service management is one of the seven sub-disciplines of the functional level of management: along with logistics management, human resource management, marketing management, production and technology management, corporate financial management and intangible asset management. [8]

The main objective of service management is to improve the quality of service offered to customers. Consequently, an optimal service generates a perception of customer satisfaction,

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which also raises the image of the company or institution that provides the service; it represents an efficient development of operations, without delays, if the service delivered is fast and accessible [9].

Romero and Romero [10], indicate that customer expectations are attitudes that they assumes about a company, and is related to the product or service given and the professionalism during contact with the client, in addition to being linked to a positive quality of a service provided, personal interest, helpfulness, efficiency and reliability; as well as negative aspects, such as rudeness, delay before responding, delay in response, incompetence and indifference among others. Finally, the movement of customers from one service provider to another is called customer churn. The main reason behind the phenomena is customer dissatisfaction with the quality of service and high rate [11].

B. Applications of the Lean Service methodology

Due to its origin, the link between lean and its characteristics has been mostly developed in the manufacturing sector. [12] Besides the production sector, lean has been widely introduced in other contexts, such as public sectors, service companies and product development departments. Lean in the service sector has focused on enterprises, in which inventories can be easily observed and managed.

There is also a fine-tuned application in high-touch services that need more interaction between customers and service providers, such as hospitals that received late care.

[13] This methodology is considered a philosophy applied to both processes and services, to achieve an improvement in quality, profitability, productivity, and customer service.

Many companies worldwide use these methodologies to achieve greater profitability and market positioning.

Human actions, such as leadership, customer orientation and adaptation to change are integrated, operational aspects such as process capacity, management and analytical thinking are also integrated [14].

C. 5s tool applications and standardized work

There are multiple tools to carry out the Lean methodology. The 5S tool stands out from the rest for its capacity as a Kaizen process, being present since its first implementation by Osada in 1980. A clear example of its successful application is the Toyota Production System (TPS). The 5S tool is considered a strategy for business excellence and is also commonly used to establish and maintain a high-quality environment in an organization. [15] 5S is a management model tool that is usually used to work with more efficiency, create a better work environment and continuous production; that is related to minimizing losses, maximizing the final delivery of the product or service [16]. To complement the 5S tool, process standardization is also applied.

Standardized work is the most well-known method of performing a specific job, which in turn makes it the safest and most efficient method of achieving deliveries in time, order, and quality. [17]. Previous research has shown that standardized

work has many positive effects (improved efficiency, knowledge transfer, decision-making, and resource allocation) [18].

III. CONTRIBUTION

The proposed method presents a blend between the tools of standardized work and 5S. The purpose of this blending is to complement each other applications to generate greater efficiency in the processes that directly influence customer satisfaction. In addition, we can provide a better work environment, and the elimination of wastes in inputs and products for sale.

As mentioned, thanks to the 5S's tools, we can reduce time within the process, eliminate waste, and promote a Lean culture inside the entire work team. Although the 5S is a tool focused on production methods, when applied to the service sector, we can obtain greater team discipline, as well as a commitment to continuous improvement, which will help us maintain and / or increase the level of customer satisfaction. On the other hand, a standardized work will help us to uniform the different processes of the flow of services, to reduce times and increase the efficiency of the entire group, with which we will obtain clients who will be served in the promised time and receiving a quality service.

As shown in Fig. 1. the application of both Lean Tools will result in increased customer satisfaction.

For the development of the proposed model, 5 phases were designed.

Phase 0: Data collection and identification of areas for improvement

This phase consists of identifying the most frequently requested services, and where we can find defects in their processes in the application times, inputs used and in the quality of the service provided. It is of utmost importance to perform a detailed analysis of each part of the service flow, as well as analyze the efficiency of the work environment.

Phase 1: Tools Identification

In this phase, we will define how to adapt the 5S's tools and standardized work to the identified problem, to propose the utilization of the tools. On the other hand, for standardized work, it is a way to find a relationship between customer satisfaction with the reduction of times and the increase of efficiency in the processes. Thanks to this tool, we will be able to define techniques that help workers reduce times in their tasks and that increase the quality of the service provided.

In the case of the 5S, it seeks to increase productivity and reduce lead times. This tool focuses on the relationship with your environment from the materials and supplies used, to the order and cleanliness you work with.

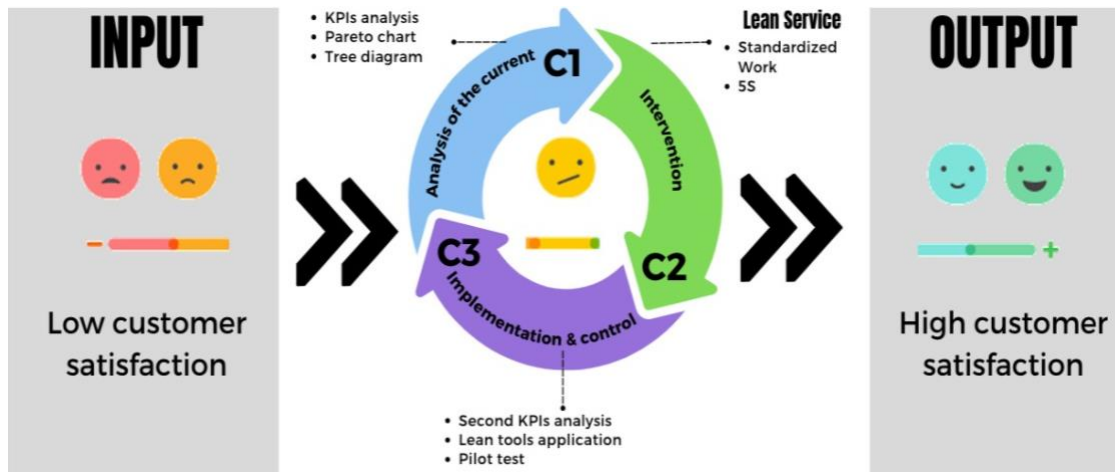


Fig. 1. Proposed Model

COMPARATIVE MATRIX

Article	Causes	Extended service times	Low service quality	Unsatisfied demand
Vanichchinchai, A. (2021)			Lean	
Realyvasquez -Vargas, To., Flor-Moltalvo, J., Blanco-Fernandez, J., Sandoval-Quintanilla, JD., Jiménez-Macias, E., Garcia-Alcaraz, JL. (2019)				Standardized work
Thapa, R., Saldanha, S., Muhammed, SP., Kritharth, PK., Sabeel, PK (2018)		5s		
Proposals		5s	Lean	Standardized work

Phase 4: Results monitoring

For the last phase, we will show the results through different KPIs that will help us measure the evolution of the improvement based on the objectives proposed at the beginning. Next, we will show the indicators.

- Net Promoter Score:

This indicator will help us measure the customer's experience with our service and their level of satisfaction, as well as the probabilities that the client recommends our service. This indicator is obtained through satisfaction surveys, to later apply the following formula.

$$\% \text{ Promoters} - \% \text{ Detractors} = \text{Net Promoter Score}$$

- Maintenance and Organization:

To be able to define the maintenance indicator for the work area and the corresponding tools, a measurement of the frequency with which maintenance is conducted at the workplace, as well as for the tools used, must be made. The

main measurement indicators with which we will observe the success of the utilization of the tools are searching time for tools and/or supplies and an Overall Rating: 5S Audit.

- Worker Efficiency

To check if the different resources have been optimized and the correct strategies have been applied to improve the level of customer satisfaction with the use of Lean tools in the different service processes, we measure the efficiency of the workers. We did this through a formula that includes process duration times, service times, costs used for the same, as well as the expected and achieved results.

$$\text{Efficiency} = (\text{Result achieved} / \text{Actual cost}) \times \text{Time invested} / (\text{Expected result} / \text{Estimated cost}) \times \text{Estimated time}$$

IV. VALIDATION

To validate the implementation of the Lean tools and verify their results, a Pilot Plan was conducted, divided into two complementary parts. With this plan, we could see if the use of both proposed tools is successful in the veterinary sector.

A. Standardized Work Model

The process standardization model consists of adapting the common characteristics of a process, to make it more uniform and in this way, to be able to increase the efficiency of the same processes, and of the workers who perform it.

The standardization method consists of a series of steps aimed at proposing an optimal procedure for a company in the veterinary services sector.

When conducting this work on a company in the veterinary sector, it is necessary to identify which processes were damaged, and that it is possible to standardize them. The process we decided to streamline was the "Grooming" process, which consists of bathing, drying and brushing pets.

The development of standardization occurred in the following order:

- Process Analysis and Documentation:

For this first step, we analyzed the process to be studied, we made a list with the activities that were conducted during the process, as well as the time taking of each activity and the value

of these to the process.

- Definition of Objectives, Scope, and Responsibilities:

After defining the flow of operations, a standard Operations Procedure was developed, which includes the objective of operation within the process, the scope of this, as well as the delegation of responsibilities.

- Drafting and dissemination of the standard process format.

For this part of the process, a tracking chart of the activities that must be conducted in the Grooming process before, during and after the service was provided was carried out with the information collected. This format contains the ideal times per activity, exact amounts of inputs and tools to use.

- Training and Application of the Guidelines

Following the Lean philosophy, the workers responsible for the process were trained, so that they understand how the process should be followed, what times they must meet, etc. After the training, they were followed up during the two months of the pilot plan, to corroborate that the workers are following the work plan.

B. 5S Application

For the application of the 5S's, we decided to focus each pillar of this tool on a specific aspect to improve within the company, to have better total results, which benefit all areas of the company, as well as customers who will receive a greater service from us.

- Seiri

For this stage, we first identify which tools and supplies have greater frequency of use, and greater ease of access for the worker according to their dimensions. For this classification, we decided to design support material so that workers can easily identify where tools or work supplies are located.

- Seiton

In the second stage, we will proceed to organize the work areas and warehouses, according to the criteria defined. We use the support material for signage, as well as the placement of pallets in the warehouses, and the installation of shelves in the work areas.

- Seiso

To carry out this stage, we first had to identify the main sources of dirt within the veterinary center, as well as places where special attention should be paid to cleaning. After doing this, we decided to carry out a cleaning plan, which will be available to workers and supervisors. This was done by hiring specialized personnel who focus exclusively on the most important places and hiring a total cleaning service that is done to the center periodically.

- Seiketsu

Having applied the three previous phases, the divisions of the work areas and warehouses must be labeled, so that this process becomes continuous, and the distribution or the established cleaning programs are not ignored.

For this phase, it was necessary to implement training programs for workers, explaining the importance of the methodology through success stories, audiovisual material, etc.

- Shitsuke

For this final stage, audits were conducted, where we were able to evaluate the performance according to each category for the application of the 5S's and verify if its implementation had a positive impact. It should be noted that, at the beginning of the pilot plan, an evaluation based on 5S was also conducted, so now, we allow ourselves to compare the results obtained.

Each 5s stage was evaluated by different criteria and rate by performance from 0 to 10 (0 - very bad, 10 – outstanding) with an 5S Audit Checklist. The method used in this audit was a radar chart which is shown in Fig. 2.

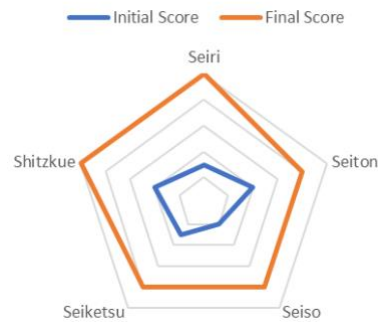


Fig. 2 5S Audit Results.

V. DISCUSSION

Scenario one

In this scenario, the implementation of the 5S tool in the study company will be presented.

For this, we will use the chosen ratios to evaluate the results obtained, which are shown in the table below.

TABLE II
5S' RATIOS

Ratio	Starting value	Value obtained	Percentage Improvement
Tools Searching Time (Minutes)	7"	2"	71%
Searching Time for Supplies (Minutes)	4"	1.5"	63%
Audits: Qualification	56%	82%	32%

After the application of the 5S's tool, we can see that there is a considerable increase in productivity within the processes, thanks to the time savings that exist in the searching times for tools and supplies, thanks to the order, cleanliness of the work areas, and the commitment of the workers to adapt to the Lean philosophy and motivate themselves to develop their functions more effectively.

By implementing this tool, we can see that operation times have been significantly reduced, and thanks to that we can now achieve the times promised to the client, as well as show them

that their pets are being cared in organized and clean environments, and with staff in constant training to provide them a high-quality service.

Scenario two

For the second scenario, we will evaluate the efficiency of the application of standardized work.

For this, we will use the chosen ratios to evaluate the results obtained, which are shown in the table below.

TABLE III
PROCESS STANDARDIZATION RATIOS

Ratio	Starting value	Value obtained	Percentage Improvement
Workers Efficiency	65%	90%	28%
Customers Served by Worker (average)	4.5	8.3	46%

VI. CONCLUSION

Thanks to the application of standardized work, it was possible to achieve a considerable increase in the workers efficiency, reaching an average percentage of 90% of efficiency, a result rarely seen in service companies, which will help us both internally and externally, to provide an optimal service, reduce some costs, and improve the work environment.

Furthermore, the productivity increases by more than 60% thanks to the correct implementation of the 5S s tool. Thanks to this, the work areas have places assigned for the tools and supplies to be used, to facilitate access, in addition to cleaning the area, conducting preventive maintenance of the tools, and scheduled relocation of supplies. Finally, we can see how the use of this tool helps to obtain a better arrangement of work environments.

Another ratio with positive results was the average number of clients served per worker, which, being related to the times and efficiency of the processes, makes it possible to serve more customers at one work shift and with better results in the services provided.

Finally, the most important thing about the implementation of both tools is that they do not involve considerable expenses for the company, only the necessary training and monitoring, as well as signaling methods, manuals, etc.

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