

Implementation of 5'S in the warehouse of a construction company

Flores Sánchez Verónica¹, José Manuel de los Santos Cortéz², Vallejo Hernández Arely³, María Guadalupe Espinosa Hernandez⁴, Juárez Borbonio Jesús⁵, Chama Esteban José Luis⁶

¹Department of IMI, Universidad Tecnológica del Centro de Veracruz, Veracruz, México

Email: calidad.utcv@gmail.com

²Department of IMI, Universidad Tecnológica del Centro de Veracruz, Veracruz, México

Email: 4928@utcv.edu.mx

³Department of IMI, Universidad Tecnológica del Centro de Veracruz, Veracruz, México

Email: arely.vallejo@utcv.edu.mx

⁴Department CETis 164, Centro de Estudios Tecnológicos y Industrial y de Servicios 164, Veracruz, México

Email: lesh1970@hotmail.com

⁵Department of ER, Universidad Tecnológica del Centro de Veracruz, Veracruz, México

Email: jesus_borbonio@utcv.edu.mx

⁶Department of IMI, Universidad Tecnológica del Centro de Veracruz, Veracruz, México

Email: jose.chama@utcv.edu.mx

Received: 09 May 2024; Received in revised form: 10 Jun 2024; Accepted: 17 Jun 2024; Available online: 26 Jun 2024

Abstract— *The 5S methodology is a Japanese management tool used to organize, clean and maintain an efficient and safe workplace. Implementing it in a construction company's warehouse can significantly improve productivity, efficiency and safety. Here's how to apply each of the 5S in this context: Seiri (Classify), Seiton (Sort), Seiso (Clean), Seiketsu (Standardize), Shitsuke (Hold). The implementation improved: Loss of time in activities, Punctual delivery with customers, Organization of the warehouse area*

Keywords— *Warehouse, Efficiency, 5S.*

I. INTRODUCTION

Here's how to apply each of the 5S in this context:

Seiri (Classify)

Objective: Eliminate the unnecessary.

Step 1: Check all materials, tools and equipment in the warehouse.

Step 2: Classify the items into three categories: necessary, unnecessary and occasionally used.

Step 3: Remove unnecessary items from the warehouse and those for occasional use should be stored in a separate and less accessible area.

Action: Create a checklist to classify materials periodically.

Seiton (Sort)

Objective: Organize what is necessary efficiently.

Step 1: Define specific locations for each type of material and tool.

Step 2: Use clear and visible labeling to identify each item and its location.

Step 3: Implement a storage system that facilitates quick access (e.g., shelving, bins, tool panels).

Action: Design a map of the warehouse indicating the locations of all items.

Seiso (Clean)

Objective: Keep the work area clean and tidy.

Step 1: Establish a regular cleaning schedule for the warehouse.

Step 2: Assign specific cleaning responsibilities to employees.

Step 3: Regularly inspect the warehouse to ensure it is kept clean.

Action: Create daily and weekly cleaning checklists.

Seiketsu (Standardize)

Objective: Establish standards to maintain the first three S's.

Step 1: Document classification, order and cleaning procedures and practices.

Step 2: Train employees in these procedures.

Step 3: Develop and display visual guides (signs, instructions, standard operating procedures) in the warehouse.

Action: Create a specific 5S procedures manual for the warehouse.

Shitsuke (Hold)

Objective: Maintain and improve 5S practices over time.

Step 1: Conduct regular audits to ensure 5S is followed.

Step 2: Foster a culture of continuous improvement and commitment to 5S among employees.

Step 3: Recognize and reward compliance and continuous improvement of 5S.

Action: Implement a suggestion and feedback system to improve warehouse practices.

Step by Step Implementation:

1) Planning and Awareness:

- a. Gather the team and explain the benefits of 5S.
- b. Appoint a leader or committee to oversee implementation.

2) Training:

- a. Train all warehouse employees in the 5S methodology.

3) Initial Execution:

- a. Carry out a massive cleaning and organization day to implement Seiri and Seiton.

4) Procedure Development:

- a. Document and standardize best practices for Seiso, Seiketsu and Shitsuke.

5) Monitoring and Continuous Improvement:

- a. Conduct audits and adjust procedures as necessary.
- b. Promote a work environment that values and maintains 5S.

By implementing 5S in a construction company warehouse, a more organized, safe and efficient work environment can be achieved, which can result in a significant improvement in employee productivity and morale.

OBJECTIVE

Implement 5's in the warehouse area to reduce errors in the processes.

HYPOTHESIS

With the implementation of the 5's, it will be possible to identify and eliminate losses in the production processes of the case study company.

JUSTIFICATION

The project reduces worker downtime and improves the management of warehouse resources, Economic penalties are avoided for delays in delivery of work already stipulated in the contract, ranging from \$50,000 pesos for each day of delay.

II. METHODOLOGY

PHASE 1: PLAN

In this first phase, the problem in the warehouse was identified, which is the loss of tools. Given this, a meeting was held with the staff to highlight the possible causes that generate the loss of materials and through that it was possible to identify what that must be worked on to solve the problem.

Procedure and description of the activities carried out.

The activities that were carried out to solve the problem are the following:

- Knowledge of the activities carried out in the warehouse area.
- Definition of the problem and solution with the personnel responsible for the area.
- Define the activities that must be carried out to reduce disorder and poor organization.
- Comparison of the different situations from the month of February to June.
- Carry out control within the area.

Knowledge of the maintenance department area

The process activities are described below, followed by the flow chart.

1. The client asks the company for a job
2. The budget is prepared by the project area and authorized.
3. The head of the purchasing department purchases the raw materials.
4. The warehouse manager receives the raw materials.
5. The assistant and warehouse manager review and control the raw materials

6. Invoice payment is made

7. Storage of raw materials.

Definition of problem and solution with responsible personnel.

Before carrying out the implementation, a work team must be formed. This stage is made up of 4 steps, which are explained below:

Step 1. Define the problem.

To have a clearer picture of the magnitude of the problem, the necessary indicators must be collected and in this way it is possible to know how much impact was had when implementing the improvements.

The case study company needs to control and manage tools and materials. Likewise, time costs and tool losses need to be reduced. Below are the company's indicators.

Indicator 1. Tool search time

Tool	Time (minutes)
Parakeet	2
Screwdriver	5
Combined keys	1
Tweezers	3
Hammers	3
Screws	15
Hydraulic material	10
Electric material	10
Safety equipment	5
Total	54

A Pareto diagram is made to detect the cause of the search time and it is identified that the main cause of lost time is due to disorder in the materials storage area with a frequency of 5.

As a result, improvements were obtained in the warehouse to benefit the company since the warehouse is the main tool for the worker, since by having order, cleanliness, verifying and classifying the material, the worker is given his work tools in order, so that it can have better performance in its activities, it is also said that there are fewer economic losses for the company because when applying 5S there is a control that must be respected by all workers to maintain order, cleanliness and discipline in the warehouse.

In conclusion, the 5S tool is a great improvement for the warehouse area, it allows us to maintain control with the

material used in the company and helps workers to have good discipline and care with the material, as well as avoid disorder, the lack of rotation of materials in order to detect and cover the greatest number of causes and see which of them affects the most. The discipline that is achieved by maintaining control in the warehouse is incredible as it favors various areas of work. It is worth mentioning that the company's management was convinced that the 5S represent an investment of time on the part of the operators and the appearance of some activities that must be maintained over time

REFERENCES

- [1] Anierte, N. (2013). Servicios de Calidad. Recuperado de http://www.aniorte-nic.net/apunt_gest_serv_sanit_4.htm
- [2] Bernal, I., Pedraza, N., Sánchez, M. (2015). El Clima Organizacional y su relación con la calidad de los servicios públicos de salud: diseño de un modelo teórico. Estudios Gerenciales, 31 (134) 8-16. Recuperado de <http://www.redalyc.org/articulo.oa?id=21233043002>
- [3] Cubeiro, J.C. (2008). Para ser Innovador hay que ser Disciplinado
- [4] Chiang, V.M.M., Salazar, B. C. M., y Núñez, P.A (2007). Clima organizacional y satisfacción laboral en un establecimiento de salud estatal: Hospital tipo 1. Theoria, 16(2), 61-76.
- [5] Faulí, A., Ruano, L., Latorre, M.E. & Ballestar, M.L. (2013). Implantación del sistema de calidad 5s en un centro integrado público de formación profesional. Revista Electrónica Interuniversitaria de Formación del Profesorado, 16 (2), 147-161. DOI: <http://dx.doi.org/10.6018/reifop.16.2.181081>
- [6] Gálvez, P. (2011). Cuestionario para evaluar la calidad de servicios deportivos: Estudio inicial de las propiedades psicométricas. Tesis Doctoral, Universidad de Málaga.
- [7] Hospinal, S. (2013). Clima organizacional y satisfacción laboral en la empresa f y d inversiones s.a.c. 16(2), 76. Recuperado de <http://www.redalyc.org/articulo.oa?id=81632390009>
- [8] Madrigal, B. (2009). Habilidades Directivas. México D.F.: Mc Graw Hill/ interamericana Editores S.A.
- [9] Najul, J. (2011) El capital humano en la atención al cliente y la calidad de servicio. Observatorio laboral, 4 (8). Recuperado de <http://www.redalyc.org/articulo.oa?id=219022148002>
- [10] Pizzo, M. (2013). Construyendo una definición de Calidad en el Servicio. Recuperado de <http://comoservirconexcelencia.com/blog/construyendo-una-definicion-de-calidad-en-el-servicio/.html>
- [11] Ruiz, E., Gago, M, García, C., y López, S. (2013). Recursos Humanos y Responsabilidad Social Corporativa. España: McGraw-Hill/ Interamericana de España S.A.
- [12] Sánchez Peris FJ. (2010) Convivencia y mediación organizacional. En Gargallo López B, Aparicio IRomero JA. Procesos y contextos educativos. (pp. 395-443) Valencia: Tirant lo Blanch.

- [13] Verdú, C. (2013). 13 Características Personales para el Éxito en la Atención al Cliente. Recuperado el 30 de agosto de 2013, de la fuente: <http://clientelandia.wordpress.com/2013/03/20/13-caracteristicaspersonales-para-el-exito-en-la-atencion-al-cliente/>
- [14] Uribe, J. (2015). Clima y ambiente organizacional: trabajo, salud y factores psicosociales. México: El manual moderno.