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Warehouse improvement: A case study for medical company

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Résumé – L'une des principales missions de tout logisticien est de savoir gérer efficacement son espace de stockage. Un espace non géré est une pierre d'achoppement pour la rentabilité de l'entreprise. Cet article décrit les techniques utilisées pour optimiser les flux et organiser l'espace de stockage en utilisant le management visuel dans l'entrepôt d'une entreprise médicale. L'approche utilisée, est une technique de management japonaise visant l'amélioration continue et l'optimisation des conditions de travail et du temps. Elle ne s'applique pas à un processus, mais à un environnement physique (magasin, bureau, poste de travail...). La norme 5S est régulièrement la première étape de toute démarche qualité. Dans cet entrepôt, nous souhaitons respecter les exigences de la norme ISO13485 et nous devons, dans un premier temps, garantir la bonne organisation du poste de travail et la propreté de l'environnement.

Abstract – One of the main missions of any logistician is to know how to manage efficiently his storage space. An unmanaged space is a stumbling block to the profitability of the company. This paper describes the techniques used to optimize the flows and to organize the storage space using visual management in a medical company's warehouse. The approach used, is a Japanese management technique aimed at continuous improvement and optimization of working conditions and time. It does not apply to a process, but to a physical environment (store, office, workstation...). The 5S standard is regularly the first step in any quality approach. In this warehouse we want to respect the requirements of the ISO13485 norms and as a first step we have to guarantee the good organization of the workstation and the cleanliness of the environment.

Mots clés – espace de stockage, entrepôt, 5S.

Keywords – storage space, Warehouse, 5S.

I. INTRODUCTION

Following its increase in activity and to strengthen its position in the medical devices market, the company where we carried out this project found itself in need of adopting a strategy to improve and optimize the performance of the supply chain to promote and ensure better customer satisfaction. The quality and efficiency of logistics services is imperative to ensure the perpetuity of the company. Logistics infrastructure and operational processes can be the principal advantage to maintain customer satisfaction and target more international market (BOUAZZA).

During this mission we were more interested in the transit warehouse, which is considered as the backbone of the company, and through which most of the interventions and installations of the equipment's pass, it is the place where the equipment's spend a few days, even a few weeks in case of problem in the site where these equipment's are going to be installed. Then they are delivered to the final customer. In this paper, we have chosen to implement the 5S in order to satisfy and respect the hygiene and safety requirements. This management method is for continuous improvement, based on eliminating wastes (time, space) named in Japanese muda (Filali, 2021).

The 5S is one of lean tools that aims to optimize the management of the work space in order to optimize the efficiency of the worker and to boost the performance of the teams (Benmamoun). It was first applied in production workshops and then extended to other areas such as administration and services. Today, the 5 S Lean is an essential tool for companies that want to improve their work methods, save time, reduce employee stress and strengthen team spirit.

The first step using this methodology is to define the initial state of the warehouse mentioning the problems that exist, the second step is to implement the corrective actions and the last step is to ensure the sustainability of the improvements implemented.

II. LITERATURE REVIEW

The basic operations of each warehouse are summarized as follows: control, receiving, storage and preparation. The items stored in the

warehouse can be raw materials, finished goods, tools, etc. The main activities in a warehouse include searching, locating, preparing and delivering ordered items (Mane, 2015). 5S is a tool to eliminate or minimize waste. 5S is often used by the industrial world, especially the manufacturing industry (Mahyuddin, 2022). The goals of the 5S approach are: to avoid cluttering the workspace with unnecessary materials, documents, tools or other objects, to guarantee a good management of the places and a clear localization of the material of work, to prevent clutter in the work area / avoid unnecessary ordering of materials, to prevent accidents at work by avoiding obstacles, to optimize the working conditions and the working time and to avoid the loss of time due to the search for objects and tools.

Previous lookup associated to 5S has been carried out through Abishek Jain, which is productiveness enhancements that have been made the usage of 5S in the manufacturing enterprise in India. The consequences of this find out about have been bought from comparative measurements of organizational overall performance earlier than and after 5S implementation. The consequences confirmed that 5S is a beneficial device to enhance organizational performance, work culture, productivity, and so on. (Dilberoglu, 2017) The 5S method is a participative approach, a team work that requires the adhesion of all and especially the strict respect of the fixed initial objectives. Its deployment in an environment goes through the following steps (Dahlgaard, 2006) :

The creation of one or more 5S animation teams per intervention site to guarantee the effective involvement of all personnel in a company, the organization of 5S teams must follow the hierarchical structure. At the top of the hierarchy, a management team will be set up, followed by a team per department, per division, per section, per site (Supply, 2020).

The clear definition of objectives and priority rules, the delimitation of the duration of the campaign and the evaluation of the material, human and financial means to be implemented. Evaluation indicators to assess the work done before, during and after. Each 5S step must be set up and communicated to the different teams.

The definition of a health and safety policy. The aim is to evaluate in advance the risks and dangers incurred and to define measures to prevent them

through the dissemination of procedures; to provide for waste collection bins and means of disposal.

The definition of a detailed action plan that specifies the intervention locations, the start and end dates of each step or 5S operation. This schedule must include milestones that materialize the moments of control, concentration and measurement of the objectives achieved.

5S is a workspace management method in Japan due to the kaizen culture (continuous improvement in personal, family, social, and professional life) adoption (Edosomwan, 1995). The 5S is a technique used to build and maintain a quality work environment within an organization. The 5S methodology in business as a kaizen process by Takashi Osada. Osada was first implemented 5S in 1980. He raised the issue of requisite for a philosophy of continuous improvement as a professional behavior through the integrating of 5S namely seiri, seiton, seiso, seiketsu, and shitsuke in the workplace (Randhawa, 2017). Seiri helps do away with all unneeded items: solely the ones that are required. Seiton specify the vicinity and portions wanted to reap the environment friendly operation. Seiso represents easy circumstance with the aid of inspection activity. Seiketsu implements visible shows and controls. Shitsuke helps hold organizational efforts in vicinity thru education and total worker engagement (Jiménez, 2015). 5S not only simplifies the work environment and reduces waste but also contributes improving safety in the workplace (Pawlewski, Salamanca, Spain, June 3-4, 2015)

III. METHODOLOGY OF THE STUDY

This research was conducted in the warehouse of a medical company. The research subjects observed are warehouse management and assessment using the 5S method. The implementation of 5S work culture follows the following steps (Rizkya, 2021) :

1. Sort (Seiri): Getting rid of everything that is not useful in the warehouse
2. Set in order (Seiton): Ensure that all items are organized and each item has a designated place
3. Shine (Seiso): Clean equipment and workplaces regularly, identify irregularities. Dust, dirt and pest
4. Standardization (Seiketsu): standardizing methods, using standard procedures. Standards should be very communicative, clear and easy to understand.
5. Sustain (Shitsuke): Continue to maintain existing procedures, audit work methods, make 5S as a chronic, integrate the culture and by developing a sense of self-discipline in employees who will participate in 5S.

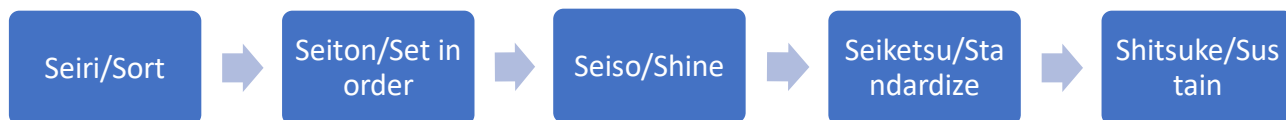


Figure 1. Steps of 5S implementation

IV. RESULTS AND DISCUSSION

A. State of the site

To clarify and understand the situation in depth (see table below) we will try to present the current

state of the store by detecting the anomalies, so that I can establish an action plan to improve the visual management and reorganize the warehouse.

Table 1. State of the warehouse

the problem detected	Comment
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Absence of cleaning cart and selective waste garbage can.	The cleanliness of the premises plays a direct role in the quality of the reception, in the brand image of the company and contributes to the safety of employees and visitors
Cardboard, pallet and marker cones placed in the passage	The lack of order can lead to accidents that can be avoided by simple actions
Destruction and lack of nameplates and labels on the shelves	Proper labeling of merchandise makes it easy to organize the warehouse and find the right item in the rack
Products, boxes and tools that are placed in an uncontrolled manner	Managing locations and ensuring a clear location of work materials is one of the bases of the 5S method
Non-comfortable lighting for the eyes	An adapted lighting allows to prevent the risks of accidents caused by a degraded visual perception of the handling with the fork elevator.
No specific location to park material handling equipment	A parking lot for handling equipment is necessary to tidy up the store
Absence of floor markings	Floor marking is a means of delimiting the work area. It is a safety measure whose main role is to indicate the risk area to the operator and the visitor in a very visual, clear and obvious way.

B. Implementation of the 5S approach

The 5S method makes it possible to permanently optimize working conditions and time by ensuring the organization, cleanliness and safety of the work plan.

1) Sort

In this part we were more interested in the removal of material (Scrap) because it represents a very important volume. For this we started the research of service providers of industrial waste treatment. Then we established a table on Excel of these providers which contains their addresses, telephone numbers, email boxes. The next step was to contact them by sending an email where we explained our need. After we received their answer, we scheduled a visit with each of them.

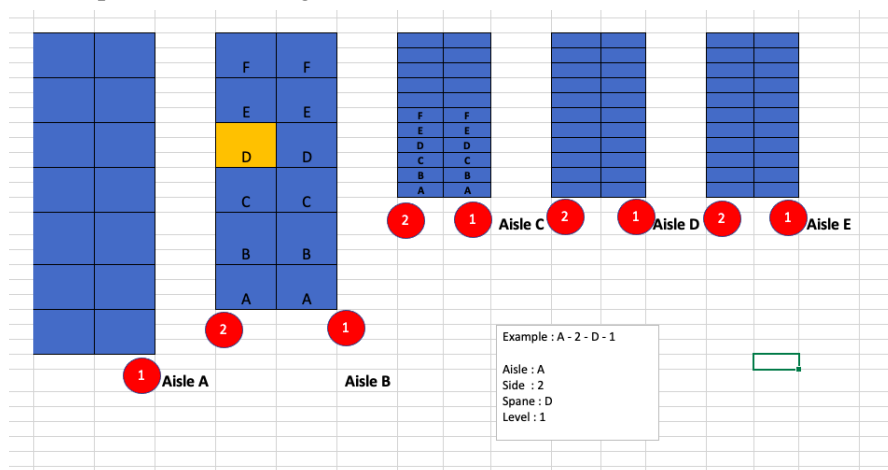
The purpose of the visit was to see the type of material (Scrap), its volume, the type of treatment and the documents required in order to give me an

estimate for the destruction of these electronic and electrical wastes and during the visit we negotiated with each of these service providers the purchase of the scrap metal which is composed of some heavy materials to minimize the costs of this service. They all accepted the offer and like that the purchase price of the scrap metal will be deducted from the price offer of the service. After selecting a single supplier based on a decision matrix we began the process of destruction and waste disposal. we were able to free up a large space that had been unnecessarily occupied.

2) Set in order

The current addressing system is composed of a code that contains only the aisle code and the column number without determining the level (floor). The realization of a new addressing system is essential to facilitate the location of articles.

The proposed addressing system:



This system gives the precise location of the articles with an alphanumeric code composed of 2 letters and 2 numbers. The first letter indicates the aisle, the first number indicates the side, the second letter indicates the bay and the last number indicates the level (shelf).

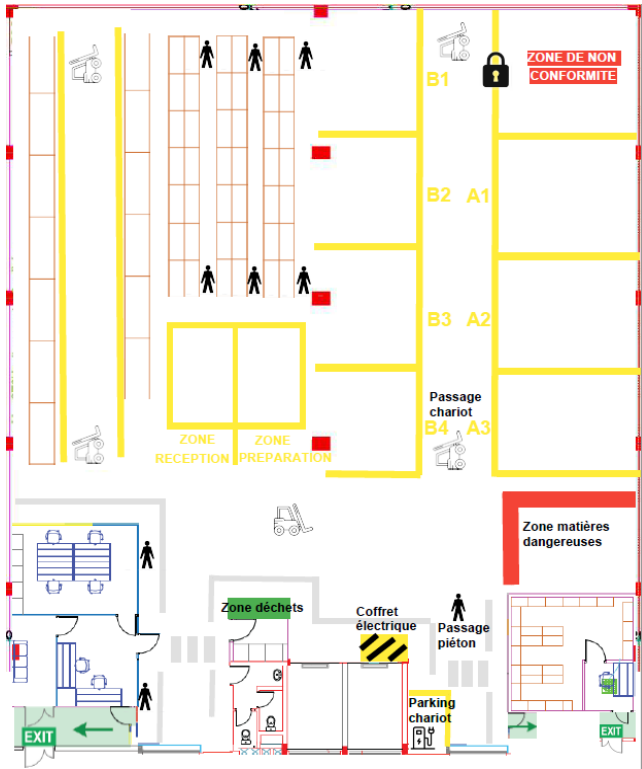


Figure 3. Road marking plan

This road marking was implemented by a service provider specialized in road marking work.

3) *Shine*

During this mission we found that the warehouse did not have a cleaning agent to do the cleaning, so we looked for two companies, one is specialized in cleaning of workplaces and the other in treatment against pests in order to sign with each of them a contract which underlines the frequency and the nature of the treatment.

4) *Standardize*

In order to improve the visual management within the warehouse, I realized a tracing plan to define each zone: aisles, mass storage zone, handling means zone, pedestrian passage, waste zone, material-digester zone, non-conforming material zone.

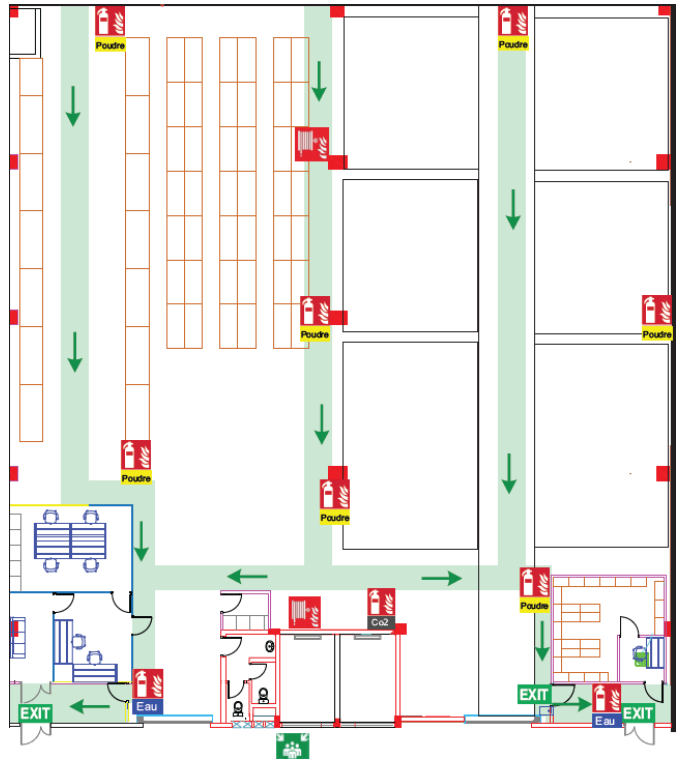


Figure 4. Evacuation plan

- Respecting traffic lanes and storage areas
- Adopt effective signage to allocate storage areas
- Standardize the waste disposal process by signing a contract with the selected service provider

5) *Sustain*

Carry out an internal audit table to ensure that warehouse workers comply with the 5S standard

N°	Points to check	Note
1	Are items properly stored and identified?	
2	Are there unnecessary items taking up space in the store?	
3	Are the aisles clean?	
4	Are the cleaning materials placed in the cleaning cart and in its area?	
5	Is the trash can clean and not overloaded?	

6	Are the fire extinguishers on the rack?	
7	Is safety equipment being worn?	
8	Are prohibition signs clearly visible	
9	Is material handling equipment parked in its area?	
10	Are offices, restrooms and kitchens clean and tidy	
Total		
Minimum score		20

Scoring : 0/Poor 1/Medium 2/Fair 3/Excellent

Validated	() YES	() NO
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Signature	
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V. CONCLUSION

The 5S approach is participative, for this reason the operators are solicited to participate in the continuous improvement of their work environment because they are the ones who confront the daily constraints. This mode of deployment is particularly motivating and helps to improve continuously. The participants are strongly involved.

The improvement of the storage infrastructure has a primary role in protecting the quality of the product and the working conditions of the warehouse workers. The personnel involved should complete and follow the improvement wheel in order to guarantee the cumulability of the improvements and to allow the company to reduce its costs and maximize its gains. In particular, the recommendations expressed by the employees must always be welcomed by the management, because each of these measures could eventually be the object of a well noticed improvement.

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