

Implementation of 6S Methodology in a Manufacturing Plant

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ABSTRACT

In the manufacturing industry we have to continuous upgrade the technology of production processes to attain better results. In these days, there is very high competition in the manufacturing industry to produce high quality products. In these days, quality is not only one issue in manufacturing sector but to achieve a high performance, high utilization of raw material, full utilization of machines and tools, save production time, providing better work environment to the workers and safety of workers etc. are also big challenges in the manufacturing industry. To eliminating these challenges of manufacturing industry we have to use latest technology and methods to attain a desired goal. The 6S methodology is one of latest and modern method to gain a desired goal in the manufacturing industry. The 6S methodology solves the all problems that affect our manufacturing industry. The 6S methodology rearranges the all resources and does every operation in a sequence to full utilization of each resource.

INTRODUCTION

The 6S is most common technique used to increase the productivity and safety of any enterprise or group. The 6S method can be executed in all type of manufacturing industries like small size, medium size and large size industries etc. The 6S is a simple method for eliminating all challenges comes in manufacturing industries in this days. The 6S method full utilizes the all resources in the plant or industry. Doing things exactly and stay them reliable^[1,2]. The 6S method attains desired results in a manufacturing industry.

The six steps of 6S method are as follows:

1. Sorting
2. Set in order
3. Shine
4. Standardization
5. Sustain
6. Safety

The 6S technique is building well-organized, safe, neat and clean workplace in any industry. The 6S technique helps in increases the work performance of employees in any industry. After execution of 6S technique in any industry, employees are more comfortable and safer in the work environment of industry. This results in progress in the overall efficiency of the industry.



Figure 1. 6S methodology.

The above **Figure 1** is the basic diagram of 6S methodology. It shows the all steps of 6S methodology. **Figure 1** explains the working and functions of the all steps of 6S methodology.

METHODOLOGY

The 6S methodology utilizes the all resources and manpower in an efficient way to attain desired results in the manufacturing industry. This is a powerful technique to increase the individual performance as well as overall performance in the manufacturing industry. The 6S technique is giving a new standard to a manufacturing plant. All safety equipment and devices are available in the plant. This method improves the quality and safety of work environment in the manufacturing industries. **Figure 2** shows the conditions before and after implementation of 6S methodology in a manufacturing industry. **Figure 2** shows the condition of machines, floor and work environment of a manufacturing plant.



Figure 2. Before and after implementation of 6S methodology in a manufacturing industry.

Sort

Sort is the first step of 6S methodology. It is the concept that helps the company to keep everything they need and throw the non-usable items away from workplace. It cleans the workplace for better operation. According to sort concept there are two types of items are at workplace: used and not-used.

In this concept, a red tag is placed on the not used items present at workplace. Follow the following steps in “red tag” process:

1. Identify the non-usable or unneeded and misplaced items ^[3].
2. Attach red tags.
3. Move the items to a holding area.
4. Dispose of the truly unneeded items.

To find out that an item is unneeded, ask yourself following questions:

1. Does it have any function in this area?
2. Is it needed? By whom?
3. How often is it needed?
4. Does it take up too much space?

Red tag holding area specifications:

- The red tag holding area is the near work station, where the 6S is being applied. The item is available there for one week for workers to reclaim items if they wrongly identify it as unneeded.
- The red tag area needs to be distinctly distinguished.
- After one week, the red tag item is removed to a central location. The red tag item is available in this area for workers to reclaim for 30 days.
- After that the unneeded items is disposed.

Set in Order

Set in order is the way to make items and tools arranged in a sequence that reduces the searching time of the tools and items ^[4]. If the company does not set all items in order, it will be very difficult and time consuming to look for the items. It is the second step of 6S, which means the company should do sort first then set in order. Set in order is to keep everything that you have sort in first step in the right place ^[5]. For example, set in order in size, weight and the rate of utility. The company has more space because in the sort step they throw out all unneeded and waste material from the workplace. But the items are not present in the right place. Manufacturing companies have many tools and items, so set in order is very important for them to reduce process time and searching time ^[6]. For example, put all the same size drills and mills together. Distinguish all different sizes of drills and mills separately. Hang the handle tools on the wall so that everyone can see them clearly. The most important step in set in order is to tag the name of tools and items so that everyone will know where the tools and items are present for that they are looking without wasting time.

Shine

This is a concept to make everything in the workplace neat, shiny and clean. For longer life of items and to make better working condition, corporation should ask the personnel to do the cleaning after off duty before they leave the company ^[7]. Wipe and clean the machines such as the panels of CNC machines. The floor area should be sweep to have a better and clean workplace. The all tools need to clean personally for their better use and long life in the company. Put everything back in the correct place after cleaning ^[8].

Standardization

Managers give some instructions to the workers to implement the first three steps regularly. Standardization is the way to help the company to set some rules and instructions to implement the first three steps daily in the company ^[9]. The rules may be regularly changed for to make better working condition. When the company has the criteria, it is easy for the new workers to get involved when they first come and try to be familiar with the new structure of the company and it is easy for old workers to lead the new workers.

Sustain

This step is to implement the all previous four steps daily in the company. The company should make a checklist to help the manager to make sure that everyone follows this step ^[10]. Once the company runs the first 5S, the staff in the company knows the benefits of 5S and implements it in the daily routine in the company.

Safety

This is the main step of 6S in the companies in present time. This is additional feature to the 5S method. The safety is

the state of being safe or to reduce the chances of accidents in the company. This is very important for making workplace safer for workers ^[11]. The companies use many safety policies and equipment to make workplace safe for working. The companies give safety helmet, safety jackets, safety gloves etc. to the workers for their personal safety at the workplace. Much safety equipment like fire extinguishers etc. is installed at the workplace in the company ^[12] **(Figure 3)**.

Fire Extinguisher present in Manufacturing Plant



Figure 3. Safety device present in a manufacturing plant.

CONCLUSION

By studying 6S methodology we conclude that this methodology is identical for manufacturing industries. Main motive of 6S methodology is to improve the performance of manufacturing industries in 21st century. This methodology improves the all areas in the manufacturing industry by eliminating unnecessary processes or tasks. The implementation of 6S methodology results in the improvement in quality of products and processes, individual as well as overall performance and safety of employees in the manufacturing industries. The 6S methodology has positive effect on the overall performance and productivity of manufacturing industries.

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