

# Implementing 5S Methodology

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**Abstract.** The paper presents a continuous improvement strategy, process-oriented and aiming to improve manufacturing at any workplace. 5S is a basic foundation of Lean Manufacturing systems. It is a tool for cleaning, sorting, Organizing and providing the necessary groundwork for workplace improvement. This research effort dealt with the basic idea of implementing 5S methodology. By following the 5S methodology, this research effort may show significant improvements to safety, productivity, efficiency, and housekeeping. The research documents improvement by using before and after pictures.

**Keywords:** continuous improvement, lean manufacturing, efficiency.

## 1. Introduction

Once used primarily by the Japanese, this concept is quickly gaining popularity in many other Countries. It has evolved into a formal technique that is useful not only for improving the physical environment, but also for improving Total Quality Management (TQM) processes. Adopting this practice could solve many everyday problems. In fact, many companies use parts of the “5-S” in their daily routines without being aware that there is a formal technique. It is one of the efficiently-working tools of Lean Manufacturing. The program gets its name from five activities beginning with the letter S, which were derived from five Japanese words. The words are Seiri, Seiton, Seiso, Seiketsu, and Shitsuke, which when translated mean Sort, Set in Order, Shining, Standardize, and Sustain, respectively. Sort helps to remove all unneeded items; only what is needed stays. Set establishes locations and quantities needed for efficient operation. Shine represents cleaning through inspection. Standardize implements visual displays and controls. Sustain helps to keep the organization effort in place through training and total employee involvement.

## 2. Strategies for 5S

The 5S system of rules represents an improvement process-oriented strategy, which is based on minor improvements of the processes involved in the manufacturing at any workplace. Within the continuous improvement framework, companies may use either the 5S or the 3S system of rules. The 3S system of rules is based on:

**SEIRI:** elimination of everything which is not useful in the workplace: residues, blanks, unused tools and equipment, scraps, superseded documents;

**SEITON:** order, storage, labeling of useful objects that were kept after SEIRI so that they can be easily found and manipulated when needed;

**SEISO:** insuring the cleanness of the entire production area (squared and marked). While cleaning their equipment, executants often discover defects that the specialized maintenance teams missed. When equipments are clean, the incipient defects are observed and easier remedied, thus increasing the utilization factor of the machines.

These 3S are considered basic, compulsory. The 5S system of rules has been developed at the beginning of the 80's by Takasi Osaka for creating an environment of total quality and adds two more categories of activities:

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SEIKETSU: Establishing a series of clear rules for the maintenance of a perfect hygiene and of an agreeable environment at the workplace;

SHITSUKE: The close following of work procedures, continuous learning and self-discipline .

The learning process allows the execution personnel:

- to do correctly the sorting, order and cleaning operations;
- to permanently apply them.

The administrative and technological discipline changes the work mentality of each employee. The advantages of implementing and maintaining the 5S system of rules are as follows:

- increase of the work productivity;
- decrease of the production costs;
- improvement of the individual activities quality;
- increase of the workplace safety;
- increase of the clients level of satisfaction;
- proving that the Quality Management System creates the framework for continuous improvement;
- workers become more organized;
- stress is eliminated.

## 2.1. The 5 Pillars of a Visual Workplace

Implementing the 5S method means cleaning up and organizing the workplace in its existing configuration. It is typically the first lean method that any organization can implement. This lean method encourages workers to improve their working conditions and helps them to learn to reduce waste, unplanned downtime, and in-process inventory .A typical 5S implementation would result in significant reductions in the square footage of space needed for existing operations. It also would result in the organization of tools and materials into labeled and color coded storage locations, as well as “kits” that contain just what is needed to perform a task.

The 5S methodology is a simple and universal approach that works in companies all over the world. It is essentially a support to such other manufacturing improvements as just-in-time (JIT) production, cellular manufacturing, total quality management (TQM), or six sigma initiatives, and is also a great contributor to making the workplace a better place to spend time.



Fig. 1: Consolidating stored items into the smallest possible footprint yields benefits ranging from more efficient use of space, faster and easier retrieval and an improved appearance.

## 2.2. Implementing 5S Methodology

All the 5S methodology is typically implemented using a 3-step process, which includes establishing a cross- functional team (including employees that work in the associated areas), touring all areas associated with manufacturing process under review, and brainstorming on ways to improve organization to reduce waste. For example, factories have more than their share of searching waste. It is not unusual for a three hour

changeover routine to include 30 minutes of searching. When attempting to reduce changeover time radically (for example, going from 3 hours to 10 minutes), there is clearly no room for 30 minutes of searching waste. Value stream mapping (VSM) can be used in the 5S process to analyze the material, process, and information flow. The information is used to develop a current state map, which sets out how things have been done in the past. The team then analyzes the current state map to identify opportunities for workplace organization and housekeeping improvements. A wide range of ideas is considered – while all ideas won't end up being viable, all are worthy of investigation. The key is to observe non value added processes and create an environment to promote value added work through waste elimination.

Finally, the team envisions a future state based on the exercise and begins implementing the future state. The process is iterative; the future state becomes the current state, and a continuous improvement process should be used to identify new ways to reduce waste. Waste is defined very broadly, and includes things like waste in the movement of material, carrying too much inventory, defects or rework, producing scrap, waiting or unnecessary motion. Some examples include waste of motion because the person sent to get a part or tool could not find it; searching waste because no one can find the key to the locked cabinet that contains needed tools; waste of defective products because defective parts were not separated properly and used by mistake; and even waste caused by unsafe conditions, as boxes of supplies that are left in a walkway, causing someone to trip and get injured.



Fig. 2: Fewer steps and greater organization mean less waste

### 2.3. The Role of Storage in the 5S Workplace Organization Methodology

As noted, one of the 5S pillars is identifying and eliminating many kinds of waste, including time wasted searching for items, waste due to difficulty in using items, and waste due to difficulty in returning items. Storage solutions play an important part in implementing waste elimination through space reduction, organization improvement and inventory management. Storage cabinets and workbench products that allow dense storage, a smaller footprint, and visual organization near where the tool is needed, become a key factor in implementing the 5S program. Systems should be set up so everything has a place that is available when needed, including the manufacturing floor, areas where products are being packaged, through the equipment maintenance area. Everything should be labelled and identified. Local storage minimizes travel time, and adjustable storage and workbenches make it easier to adapt to the differing needs of individual employees. Storing tools next to machines in use rather than in multiple storage locations around the facility can save hours each day.





Fig. 3: left image shows picture before implementing 5S and right one after 5S

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