

**A PROJECT REPORT**  
**ON**  
**“IMPLEMENTATION OF 5S AT MALMOSTEELS**  
**PVT.LTD”**

**Submitted to**  
**UNIVERSITY OF MUMBAI**

**In Partial Fulfilment of the Requirement for the Award of**

**BACHELOR’S DEGREE IN**  
**MECHANICAL ENGINEERING**

**BY**

<b>SHAIKH MOEEZ MUKHTAR</b>	<b>16DME171</b>
<b>SHAIKH NAUSHAD MOHAMMED UMAR</b>	<b>16DME176</b>
<b>SAYYED MOHAMMED AARISH</b>	<b>16DME169</b>
<b>ANSARI SHOEB JAVED</b>	<b>16DME129</b>

**UNDER THE GUIDANCE OF**  
**PROF JALAL KHAN**



**DEPARTMENT OF MECHANICAL ENGINEERING**  
**Anjuman-I-Islam's Kalsekar Technical Campus**  
**SCHOOL OF ENGINEERING & TECHNOLOGY**

Plot No. 2 & 3, Sector - 16, Near Thana Naka,  
Khandagaon, New Panvel - 410206

**2018-2019**

**AFFILIATED TO**  
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PROF.JALAL KHAN**

**DEPARTMENT OF MECHANICAL ENGINEERING**

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**AFFILIATED TO**



**UNIVERSITY OF MUMBAI**

# Anjuman-I-Islam's Kalsekar Technical Campus

Department of Mechanical Engineering  
SCHOOL OF ENGINEERING & TECHNOLOGY  
Plot No. 2 & 3, Sector - 16, Near Thana Naka,  
Khandagaon, New Panvel - 410206



## CERTIFICATE

This is certify that the project entitled

**”IMPLEMENTATION OF 5S AT MALMOSTEELS PVT.LTD”**

submitted by

<b>SHAIKH MOEEZ MUKHTAR</b>	<b>16DME171</b>
<b>SHAIKH NAUSHAD MOHAMMED UMAR</b>	<b>16DME176</b>
<b>SAYYED MOHAMMED AARISH</b>	<b>16DME169</b>
<b>ANSARI SHOEB JAVED</b>	<b>16DME129</b>

is a record of bonafide work carried out by them, in the partial fulfilment of the requirement for the award of Degree of Bachelor of Engineering (Mechanical Engineering) at *Anjuman-I-Islam's Kalsekar Technical Campus, Navi Mumbai* under the University of MUMBAI. This work is done during year 2018-2019, under our guidance.

**Date:**     /     /

**(Prof. Jalal Khan)**  
**Project Supervisor**

**(Prof.Rizwan Shaikh)**  
**Project Coordinator**

**(Prof.Zakir Ansari)**  
**HOD**

**DR. ABDUL RAZAK HONNUTAGI**  
**Director**

**External Examiner**

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I am grateful to him/her for his timely feedback which helped me track and schedule the process effectively. His/her time, ideas and encouragement that he gave is help me to complete my project efficiently.

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At last we must express our sincere heartfelt gratitude to all the staff members of Mechanical Engineering Department who helped me directly or indirectly during this course of work.

SHAIKH MOEEZ MUKHTAR  
SHAIKH NAUSHAD MOHAMMED UMAR  
SAYYED MOHAMMED AARISH  
ANSARI SHOEB JAVED

## Project I Approval for Bachelor of Engineering

This project entitled *Implementation Of 5S At Malmo Steels.Pvt.Ltd* by *Shaikh Moez Mukhtar, Shaikh Naushad Mohammed Umar, Sayyed Mohammed Aarish, Ansari Shoeb Javed* is approved for the degree of *Bachelor of Engineering in Department of Mechanical Engineering*.

### Examiners

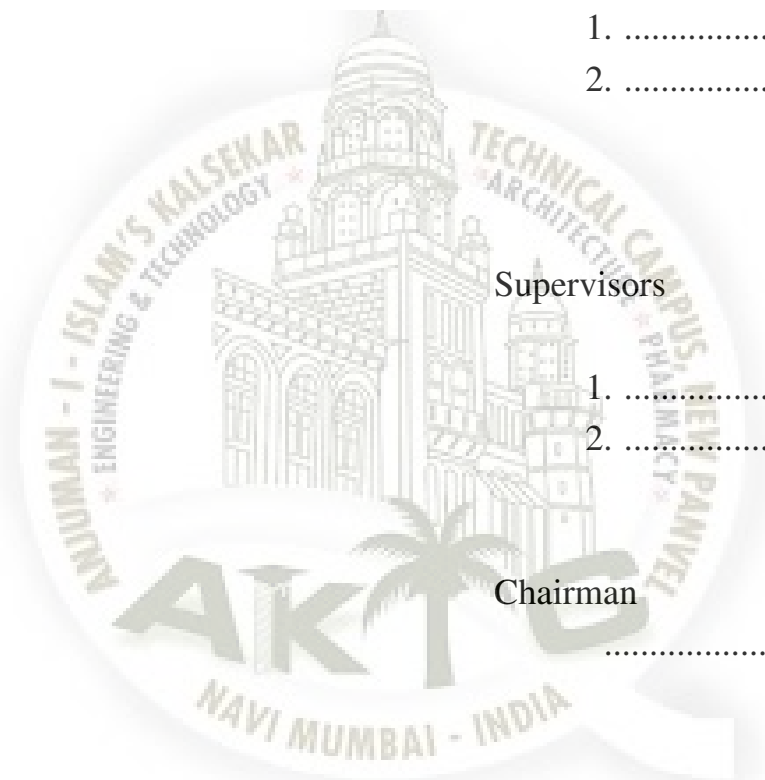
1. ....
2. ....

### Supervisors

1. ....
2. ....

### Chairman

.....



## Declaration

I declare that this written submission represents my ideas in my own words and where others ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission. I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.



Student Name:-Shaikh Moez Mukhtar

Roll Number:-16DME171

Student Name:-Shaikh Naushad Mohammed Umar

Roll Number:-16DME176

Student Name:-Sayyed Mohammed Aarish

Roll Number:-16DME169

Student Name:-Ansari Shoeb Javed

Roll Number:-16DME129

## ABSTRACT

5S is a basic foundation of Lean Manufacturing systems. It is a tool for cleaning, sorting, organizing and providing the necessary groundwork for workpiece improvement. This project dealt with the implementation of 5S methodology in the small scale industry. By following the 5S methodology. 5S is a systematic technique used by organizations comes from five Japanese words; Seiri (sort), Seiton (set in order), Seiso (shine), Seiketsu (standardize), and Shitsuke (sustain). This system helps to organize a workplace for efficiency and decrease wasting and optimize quality and productivity via monitoring an organized environment. It also provides useful visual evidences to obtain more firm results. There is a real need for empirical studies in field of new management systems and their impact on company's performance. As importance role of continuous improvement in today's organizations, and lack of sufficient evidence to show the positive impact of 5S on organizational performance, this project aims to determine performance factors and characteristics in MALMOSTEELS.PVT. LTD. and identifying the effectiveness of 5S implementation on organizational performance as well.

**Keywords:** 5S Methodology, Workplace, Continues Improvement, Standerdize, Workplace.

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# Chapter 1

## Introduction

These chapter overall discuss the introduction of the 5S implementation in the Malmo Steels pvt. ltd. In this part, the briefing of the background, problem statement, objectives, scopes and the objective of the project are discussed.

### 1.1 Problem Definition

The small scale industry occupies a prominent position of unique importance in economy of India. It has emerged as powerful tool in providing relatively larger employment next to agriculture. Global markets are continuously changing and demanding product of high quality and low cost. In India, the survival and the growth of small scale industry largely depends on its ability to innovate, improve operational efficiency and increase productivity.

Many business have been trying to adopt new business initiative in order to stay alive in the new competitive market place. Lean manufacturing is one of these initiatives that focuses on the cost reduction by eliminating wastes. There is a need to follow the method according to its framework to be easy to use and allow a practical and comprehensive measurement and also to cover most aspects of total quality management. It also allows a meaningful and practical analysis in the sense of being usable for total quality management approach and being applicable to the industry.

### 1.2 Objectives

The main objective of the present work is to simplify, clean, and sustain a productive work environment at Malmo Steels pvt.ltd.. 5S is a system which will reduce waste and optimize productivity through maintaining an orderly store and using visual cues to achieve more consistent operational results. Implementation of this

method will "clean up" and organize the store basically in its existing configuration using 5S which is an effective tool for improvement of organizational performance regardless of organization type, size, its production or its service. 5S techniques would strongly support the objectives or organization to achieve continuous improvement and higher performance. The objective of our research was to increase the storing place with 30 standards and service procedures specific to the workshop, reduce unproductive time with 10. The Malmo Steels pvt. Ltd. is keen on increasing the effectiveness of their manufacturing and assembly operations through a better workflow and an enhanced layout of the inventory store. This is essential step in the industry's effort toward attaining excellence at all aspects and activities. Hence, this project aims to study the current workflow at Malmo Steel Industry pinpoint existing flow issues, and analyze the overall impact on the effectiveness of the production system

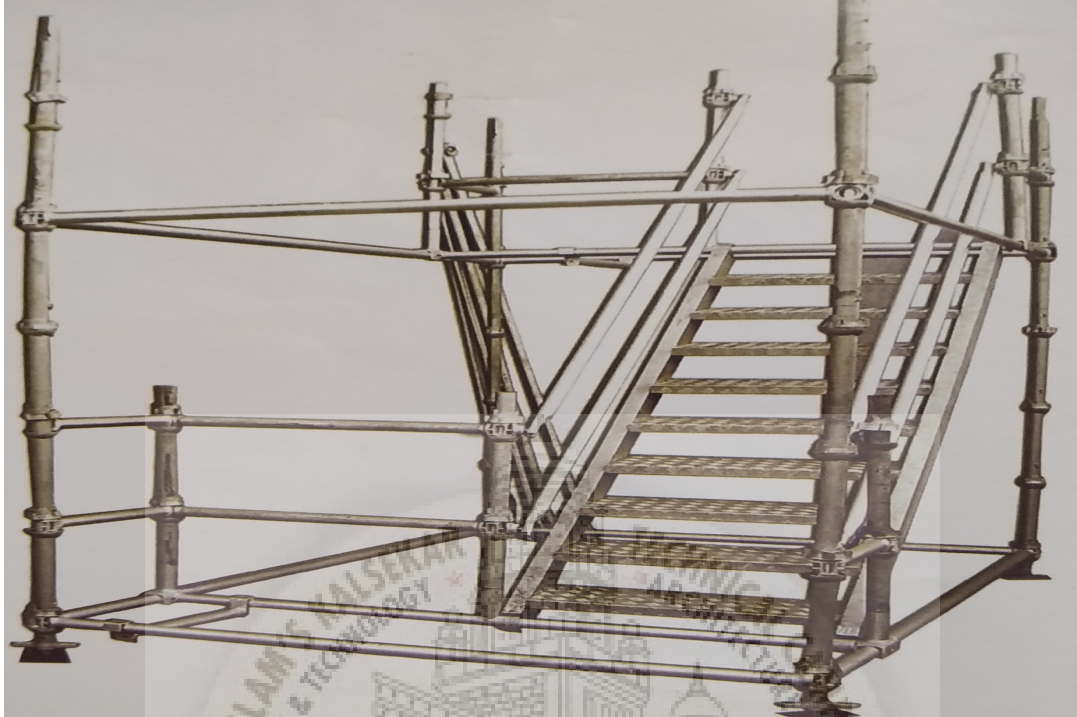
### 1.3 Scope Of Project

5S effects on performance in similar organizations, review requirements of the implementation and deployment of 5S practice, and review of the key success factors for organizations that have been successful in implementing of 5S and other quality management and store keeping systems. The methodology used can be extended for more factors by involving more reviews to get more accurate results.

### 1.4 Company Profile

Malmo steel industry is established in the year 1992. It is situated in Taloja midc. Malmo Steels gives the highly customized designs according to the customer need. The team is specialized in manufacturing a wide range with superior quality and superior techniques. Our services include ending, forming welding, machining. Our services are timely delivered to the customers all over the world. MALMO STEELS design department consist of a team of temporary structure designers with extensive learning in structural engineering, training in line with latest computer assisted design softwares worldwide, knowledge in statutory and regulatory requirements for designing, ethics and experience in their domain; enhanced by the practical application of engineering principles at site to ensure that all design has been prepared in accordance with its intention during the period of construction. Malmo steel industry makes the product like

1. **SCAFFOLDING:** In that the system has built in spigot and are light weight allow faster assembly and dismantling no skilled labour required.



**Figure 1.1:** Scaffolding

2. **PROPS AND STRUTS :** They are also invaluable for a wide variety of order application in general building construction and repair work.



**Figure 1.2:** Malmo props

3. **FABRICATION:** Engaged in providing reliable customer-built fabrication to the clients which involved in latest technology.

4. **MAST CLIMBER** : Offer a full service and rebuild programs for all makes and models of hoists , mast climbers and transport platforms.



**Figure 1.3:** Mast climber

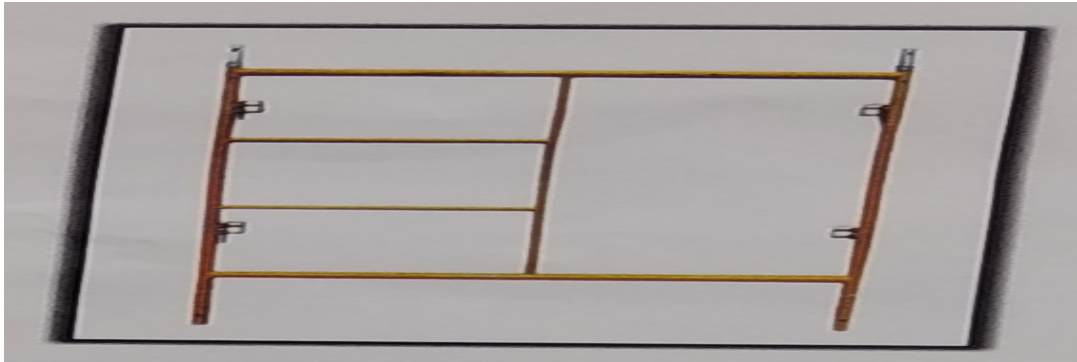
5. **MALMO PROPS** : This are the props by using the sleeve , prop nut and prop pins by using this all parts to make the malmo prop which is used in construction side.
6. **ADJUSTABLE TELESCOPIC SPANS** : These are used in various industries .sheets and lettices of 10 diameter are used for making these adjustable telescopic spans.



**Figure 1.4:** Adjustable teliscopic span

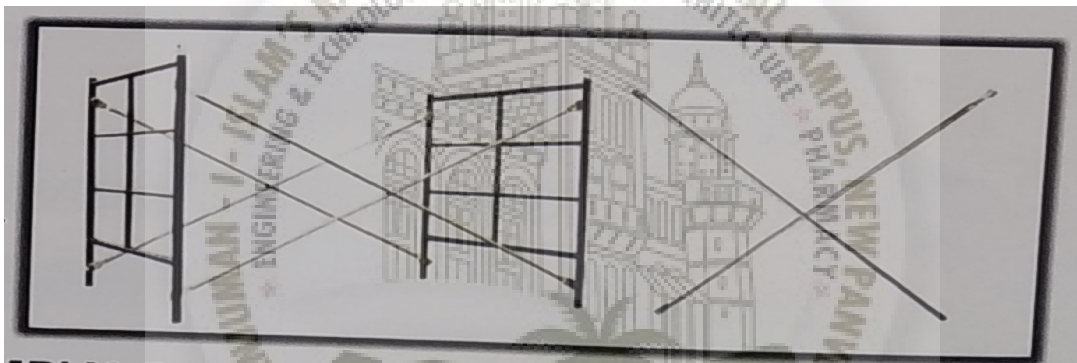


7. H-FRAME : It consist of welded frames with 48.3 mm O.D. It is used for support of heavy structures.



**Figure 1.5:** H frame

8. CROSS -BRACING : Cross bracing are door-like scaffolding important accessories used to joint H-frames together in transverse .



**Figure 1.6:** Cross-bracing

This all above product are used in masterclimber, aluminium ladder, sheep hurdle , bridge , ship construction, building construction.

The malmo steel exports it product all over the world specially in nepal , america etc. This are the vendor of the company.

## Chapter 2

# Literature Survey

### Introduction

In this chapter we will proceed with the reference review from the relevant literature. It includes the details related to the information and history which have been done already by other people that involve implementing of 5S lean manufacturing methodology.

### 2.1 Case study concerning 5S method impact in an automotive company

In a constantly changing economic environment strong developed countries created significant management models to follow. 5S, as part of Toyota Production System (the most used management model in automotive industry), is a method which develops discipline and cleanliness at workplace, maximizing efficiency and productivity. This paper aims to study the relationship between 5S evolution and productivity in a local company from Mures County, Romania, which operates in automotive industry for over 10 years, and it is part of an Austrian group. The objective of this paper was to demonstrate that 5S method is very important and have a positive correlation to overall performance of production results.

Finding:-As a result of the conducted analyses, the hypothesis H1 was proven: the correlation show a positive relation between 5S Level and Productivity in an automotive cable production plant, and the goals defined at the beginning has been fulfilled. This means that implementing and maintaining 5S method and standards in the company leads to improved performances. The need of having 5S method implemented represent one of the first step taken in the Lean Management strategy and it determines, as a result, the increase of the productivity of the organization.



Moreover, due to 5S, the factory is a cleaner place, the safety at workplace and the product quality is increased, the problems are easy to detect and prevent, waste and costs are reduced, the product or service fulfils the customer needs in the most efficient manner. Contrariwise, the lack of efficiency and organization at workplace lead to waste of time and resources, low quality products, disorganization, safety problems, delivery delays and so on. In an increasingly competitive environment it's absolutely necessary to efficacious manage the company's processes. 5S method is a starting point for any company who wants to achieve high goals and positions.

## **2.2 The implementation of 5S lean tool using system dynamics approach**

The 5S (sort, set, shine, standardize and sustain) lean tool has been known to improve system performance. In the current study, the short run dynamic implications of the sorting aspect of 5S is investigated using system dynamics. A system dynamics model is developed for a manufacturing case study and simulated to establish the effect of sorting activity on manufacturing throughput. The purpose was to assess, in advance, the system performance outcomes when 5S practices are improved. The simulation results were the stimulus for real life improvements in the system because the simulation results were able to mimic the real-life outcomes. While the simulation results encourage further improvements to be implemented, the model developed in the current paper is replicable in other instances as the variables used in the model are generic and common to most types of manufacturing systems, particularly those new to lean practices. The dynamic analyses of 5S lean practices is not common. The study also reveals some interesting relationships between 5S and other lean practices and between 5S and system performance.

**Finding:-** The SD model was built and simulated to indicate how system throughput will improve as 5S practices are improved. The methodology advanced and used in the present study has shown the direct and unambiguous link between improvements in 5S and the impact on manufacturing system performance. It therefore supports the hypothesis often advanced in the literature, that lean practices improve manufacturing system performance.

## 2.3 5S Implementation In Small Scale Industry: a Case Study

5S has the powerful tool of Lean manufacturing to improve the productivity in small scale industries. It may be combined with other tools such as Kanban, Kaizen, Total Preventive Maintenance and Total Quality Management in selected places. This paper presented an application of '5S' technology in small scale industry, Harsh Polymers, Kadepur, Maharashtra, which is the manufacturer of the polypropylene bags. Most of the small scale industries are unaware about the lean manufacturing tools. The main aim of this is the implementation of '5S' in the small scale industry to enhance the productivity, safety, efficiency through effective place management. The efficient implementation of 5S technique leads to subsequent improvement in productivity of the manufacturing plant. Keywords: Lean Manufacturing, 5S, 5S implementation

**Finding:-** By implementing 5S, improve the quality, productivity and efficiency of industrial organization. The 5S is an effectiveness to manage tools and materials which can improve housekeeping, environmental conditions and health and safety standards and quality. This paper shows 5S implementation in the small scale industry. This implementation leads to the improvement of the productivity of the organization in many small things such as the reduction wastage; reduce production time, set standard in small scale, cleanliness, proper arrangement of the organization. This Japanese technique which is implemented in the industry creates awareness about discipline and self-responsibility among the all levels of the organization.

## Chapter 3

# Methodology Of 5S

### 3.1 Introduction

5S initially based on the Japanese acronyms of seiri (organization), seiton (neatness), seiso (cleaning), seiketsu (standardization) and shitsuke (discipline), is used as a platform for developing an integrated management system by the parallel use of total productive maintenance (TPM) (Bamber et al., 2000). Osada (1991) refers to 5S as the five keys to a total quality environment. 5S is a system to reduce waste and optimize productivity and quality through maintaining an orderly workplace and using visual cues to achieve more consistent operational results. The practice of 5S aims to embed the values of organization, neatness, cleaning, standardization and discipline into the workplace basically in its existing configuration, and it is typically the first lean method implemented by firm. Kobayashi et al. (2008) make a distinction between 5S as a philosophy or way and 5S as a technique or tool by comparing the frameworks provided by Osada (1991) and Hirano (1995) respectively. From their study, they conclude that 5S tends to be recognized as a philosophy in Japan, but in the other hand it is likely to be considered as a technique or tool in the United Kingdom and United State of America.

Osada (1991) views 5S as a strategy for organizational development, learning and change, whereas Hirano (1995) considers 5S to be an industrial formula that differentiates a company from its competitors. A common definition of 5S in the West is housekeeping (Becker, 2001; Chin and Pun, 2002; Ahmed and Hassan, 2003; Eckhardt, 2001). In the West both 5S and TPM are sometimes 9 disregarded or at least underutilized (Douglas, 2002). A framework of applying 5S within a business (as appose to a personal philosophy of way of life) was first formalized in the early 1980s by Takashi Osada (Ho et al., 1995). The practice of 5S aims to embed the values of organization, neatness, cleaning, standardization and discipline into the

workplace (Osada, 1991). In Japan the 5S practice was initiated in the manufacturing sector and then extended to other industries and services sector. The Toyota Production System provides a well-known example of 5S principles in practice, the early versions were based on 3-S this, became 4-S (Ohno, 1988)

### 3.2 History Of 5S

5S was developed in Japan. It was first heard of as one of the techniques that enabled what was then termed 'Just in Time Manufacturing'. The Massachusetts Institute of Technology's 45- year study into the future of the automobile in the late 1980s identified that the term was inappropriate since the Japanese success was built upon far more than components arriving only at the time of requirement. John Krafcik, a researcher on the project, ascribed Leanto the collective techniques being used in Japanese automobile manufacturing; it reflected the focus 10 on waste in all its forms that was central to the Japanese approach. Minimised inventory was only one aspect of performance levels in companies such as Toyota and in itself only arose from progress in fields such as quality assurance and Andonboards to highlight problems for immediate action. 5S was developed by Hiroyuki Hirano within his overall approach to production systems.

Many Western managers coming across the approach for the first time found the experience one of enlightenment. They had perhaps always known the role of house-keeping within optimized manufacturing performance and had always known the elements of best practice. However, Hirano provided a structure for improvement programs. He pointed out a series of identifiable steps, each building on its predecessor. Western managers, for example, had always recognized the need to decide upon locations for materials and tools and upon flow of work through a work area; central to this (but perhaps implicit) is the principle that items not essential to the process should be removed – stored elsewhere or eliminated completely.

By differentiating between Seiri and Seiton, Hirano made the distinction explicit. He taught his audience that any effort to consider layout and flow before the removal of the unnecessary items was likely to lead to a sub-optimal solution. Equally the Seiso, or cleanliness, phase is a distinct element of the change program that can transform a process area. Hirano's view is that the definition of a cleaning methodology (Seiso) is a discrete activity, not to be confused with the organization of the

workplace, and this helps to structure any improvement program. It has to be recognized, however, that there is inevitably an overlap between Seiton and Seiso. Western managers understood that the opportunities for various cleanliness methodologies vary with the layout and storage mechanisms adopted. However, breaking down the improvement activity in this way clarifies that the requirements for the cleanliness regime must be understood as a factor in the design aspect of Seiton. As noted by John Bicheno, Toyota's adoption of the Hirano approach is '4S'.





### 3.3 Philosophy of 5s

#### Introduction

5S is a manufacturing management technique to organize work place. These are five Japanese techniques (5S) which standardizes the process to improve the work in the manufacturing facility. The implementation of 5S is divided in to five different steps and that is discuss below:

#### SEIRI / SORT:-

Seiri or sorting is initialization of implementation in 5S, it includes categorical sorting of the required items depending upon their importance. The systematic removal of unnecessary items, work pieces from the shop floor improves and optimizes the workplace management. The necessary and unnecessary items are available in the work area should be sorted and classified. The benefit of sorting is that the identification of the materials, tools, equipment and necessary items become much easier. It helps to maintain the workplace clean and well- organized inventory with improved retrieval efficiency of the workplace reducing the material handling costs. Steps for performing Sorting –

- Firstly,trained the workers/ supervisors to make a list of all necessary things and not necessary things which are causing the mixing of the resources.
- All unnecessary parts of items on work floor were brought back to its previously destined position.
- All the tools and machine parts should be paced in its own places.
- Checked for once, weather all necessary things sorted in their own place.
- Classification of all tools was done in consultation with supervisor.

#### SEIRI ( Sort )



Figure 3.1: sort

### SEITON / SET IN ORDER / STRAIGHTEN:-

After sort the second step in 5S is seiton or set in order. After sorting the remaining items are to be arranged in efficient manner through the use of ergonomics principle and making sure that every item should be at proper place and none is left out. Proper signage of the workplace and inventory is also very important. E.g. Marking the area by sign boards helps to identify the areas of storage of materials and other useful items and use of labeling to identify the materials, tools, scrap, spare parts and documents and if possible, arranged that systematically for easiest and most efficient and hierarchical access. The benefits are the it increases the effectiveness, efficiency of the production and reduces the time required for seeking the items. It improves the safety. Steps for setting the items in order –

- Firstly,decided the positions where the items supposed to be placed, by doing discussions with staff and supervisors.
- Then segregated all tools on the basis of regular uses like drill bits, measuring tape, Vernier caliper, measurement and machining tools etc.
- Put all the important items in an accessible position based on their importance and frequency of use. Small tools should be easily accessible.



**Figure 3.2:** Set in order

### 3.SEISO / SHINE:-

Seiso is the third step in 5S. Seiso or shine is the careful cleaning of the machinery, tools, area, tables, floor and other equipment. The damages or faults will be identified such as oil leaks, etc using this technique. In this aesthetic view is taken into consideration. The benefits of this step are that it increases the efficiency of machines, finds the error in the working area, maintains the cleanliness in the facility. Steps for shine

- checked roughly everything and clear all major sources of unnecessary things.
- call to clean all the machine on a regular or atleast on the weekly basis.
- Ensure to clean the work floor prior to the starting of the next process.



Figure 3.3: Shine

#### 4. SEIKETSU / STANDARDIZE:-

Standardization is to assure that we have prevailing ways of working across the departments or facilities. Through standardization uniformity in working and product quality can be achieved. The benefits of this method that it increases the safety of industry and helps in reducing the pollution created by the industry. Steps for standardizing –

- Made an audit sheet or checklist to ensure the cleanness
- Try to inculcate the habit to Maintain habit to check the progress in the cleanness among the employees. Management should give strict instruction about cleanness to the whole staff.



Figure 3.4: Standardize



## 5. SHITSUKE / SUSTAIN:-

Final and the last step of 5S is Shitsuke or sustain, ensuring the continuity in implementation of previous four stages of 5S. Maintain the facility clean, carry out the audits, etc. and we tried to make sure that the 5S become the culture of the business and everyone is responsible and accountable. And made sure that the exercise of the 5S is executed or audit is done once a month. The Benefits of this is that it had increased the awareness among the staff and reduced the chances of mistake. Steps for sustain –

- The manager or the in charge of the industry was asked to take the responsibility to held a program for 5S rule. And take care that the staff should understand and practice those rules.



Figure 3.5: Sustain

## Chapter 4

# Situation Of Industry Related To 5s

### 4.1 Seiri-Sort

As shown in Fig. 4.1 In sorting we distinguished the useful and scrap items. Then scrap items were kept all aside at one location. The below images are of the before and After Implementing of 1S Scrap included, cut outs of M.S plate, empty drums, welding rods, grinding wheel, used office stationary, rusted bolts and nuts, wooden blocks used for packing, cut outs from rods etc.



Figure 4.1: Before implementation of sort



Figure 4.2: After implementation of sort

## 4.2 Seiton-Set In Order

As shown in figure below we differentiate malmo props according to the size, then we segregated different components which are used in assembly of different products sorted and arranged the props according to size (48 mm, 38 mm) outer pipes, inner pipes, assembled pipes.



Figure 4.3: Set in order

sorted the bins and the useful components are arranged in a well manner in order to save the space.



Figure 4.4: Before implementation of set in order



Figure 4.5: After implementation of set in order



we have taken all the dimensions and number of available fixtures and SPM and allocated suitable space for all fixtures and SPM so as to reduce the space occupied by them and to provide ease to worker to work on fixture.

all fixtures are arranged at one location.

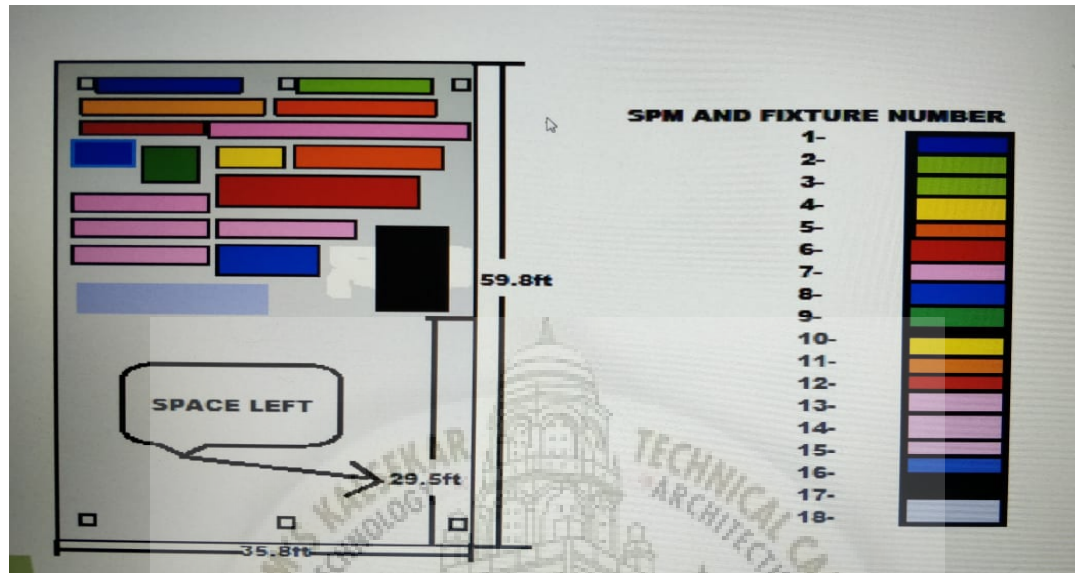


Figure 4.6: Fixture Arrangement

### 4.3 Seiso-Shine

Cleaning is third method of 5S technique; we implemented this method as we were proceeding with the sorting method. As we were proceeding the sorting, we were differentiating used and not used items and then we cleaned the whole work place, then after unwanted items were placed in Scrap Area. Cleaning also involved dusting of the material which were untouched from a long period of time. It also involves proper light exposure in the room for better work environment.



Figure 4.7: After Cleanliness

#### 4.4 Seiketsu-Standardize

Make a habit of keeping on things on his place after completion of work from where it is picked up.

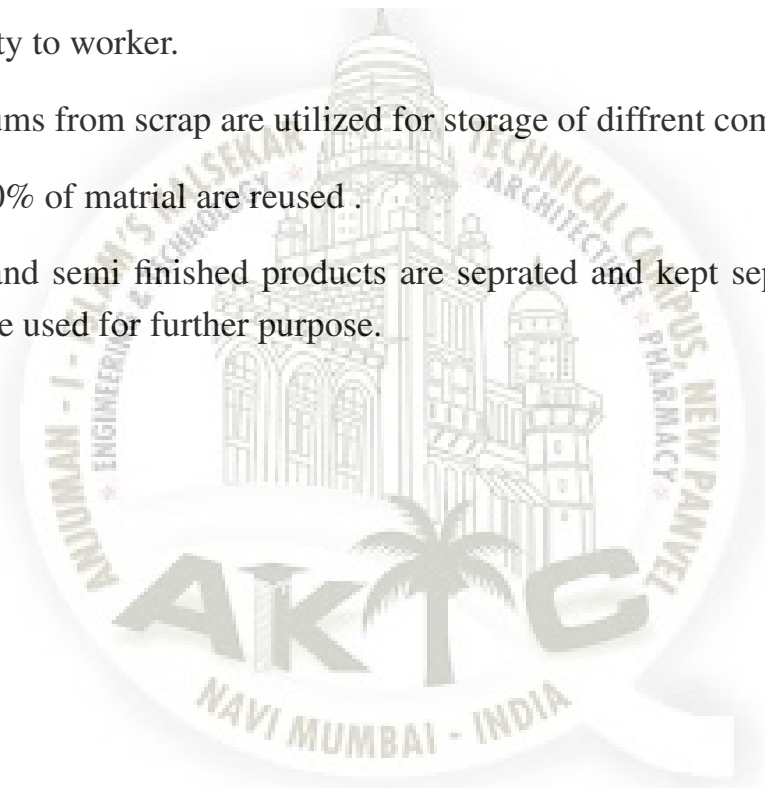
#### 4.5 Shitsuke-Sustain

The fifth S stands for Shitsuke (sustain), Sustain is about the mental and physical disciplines required to maintain the other 4S items. It is done with help of co-operation between employees, store keeper, engineer and manager.

## Chapter 5

### Results

- Space optimization by 40%.
- More safety to worker.
- Empty drums from scrap are utilized for storage of different components.
- Around 30% of material are reused .
- Finished and semi finished products are separated and kept separately so that they can be used for further purpose.



## Chapter 6

### Conclusion and Future Scope

5S lean manufacturing system is one of the options to reduce non value-added activity (wastes) and improve operational efficiency of the organization. The efficient implementation of 5S technique leads to subsequent improvement in productivity of the manufacturing plant. The 5S improves environmental performance and thus relate primarily in reduction of wastes in manufacturing. It promotes neatness in storage of raw material and finished products. The 5S implementation leads to

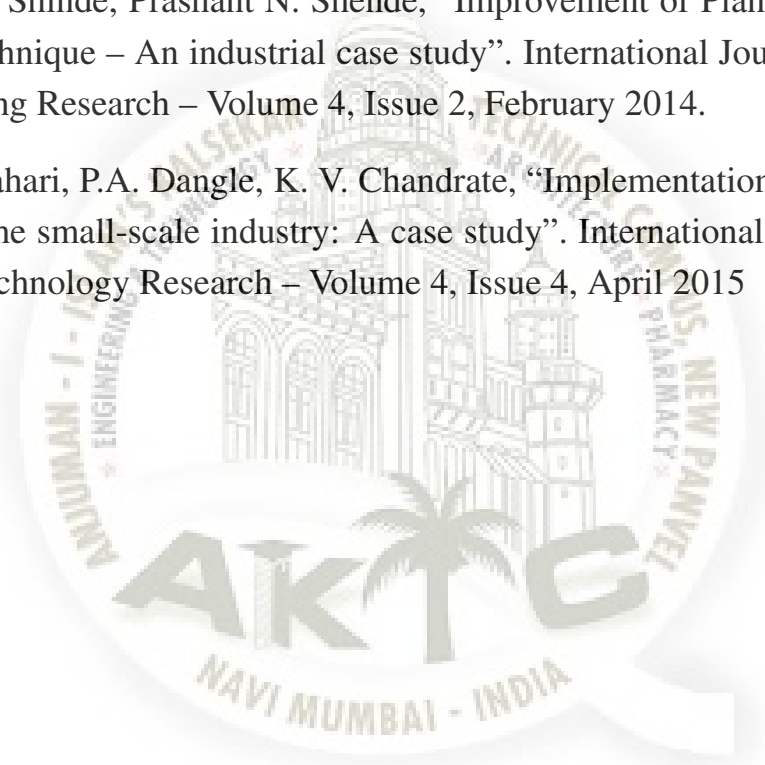
- The improvement of the case company
- Organization in many ways for instance.
- Better usage of working area
- Work environment improvement
- Reduction in accidents.
- Discipline in the employee.
- Ease in extraction of materials required in production process.
- Healthy environment for workers.
- Increase in workers safety.
- Optimum utilization of workplace.

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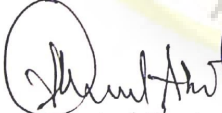
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