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Implementation of Quality Tools in Material Store Management System

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Abstract: ***The raw material and finish goods important aspects for any manufacturing industry. As this plant newly constructed so the Raw material and finished goods are not that properly arranged and not in proper manner, it is complicated for the workers and store in charge to keep track of the materials. We identified the problem and discussed it with the industry guide and come to know that we can implement 5S in this plant. 5S is a five-step methodology for creating a more organized and productive workspace: Sort, Straighten, Shine, Standardize, and Sustain. 5S serves as a foundation for deploying more advanced lean production tools and processes.***

Keywords: Raw material, newly constructed plant, 5-S, Manufacturing Industry, Productive workspace

I. PROBLEM STATEMENT

1) No tracking of finish goods and raw material.
2) Lack of management in store system.
3) Misleading to appraisers when they required small parts, so lack of design of storage system.
4) Scattered material, raw materials in the stores

II. OBJECTIVES

1) To study the components, quantity, size.
2) To study BOM.
3) To design storage accordingly.
4) Make sure safety aspects to be considered.
5) To monitor for sustenance, see for further improvement

III. INTRODUCTION

A. Material Storage System

The term inventory refers to the raw materials used in production as well as the goods produced that are available for sale. A company's inventory represents one of the most important assets it has because the turnover of inventory represents one of the primary sources of revenue generation and subsequent earnings for the company's shareholders. There are three types of inventories, including raw materials, work-in progress, and finished goods. It is categorized as a current asset on a company's balance sheet. Quality System Basics is a system of tools designed to help prevent/ minimize variation in manufacturing processes and reduce defects and warranty costs to the company.

The goal of QSB implementation is to reduce External Parts Per million by driving down internal defects and putting immediate containment measures in place. It is accomplished via communication, scrap marketplace, layered audit, establishing visual and daily management metrics, basic and advanced problem-solving tools.

The QSB assessment is a scorecard and roadmap to track your progression through levels of quality system sophistication. A great way to incorporate QSB into every cell by creating goals for certification and competition between cells. QSB is a kit of tools and methods which provide a fast response in the case of claim. It also avoids our customers getting defective parts. These are the tools for QSB they are Fast response, Control of nonconforming products, Standardized work, Standard operator training, Risk Reduction (RPN), Error proofing verification, Layered Audits.

Fig 1. Instrument storage system

A. 5s – Foundation of Lean Manufacturing

5S operation model is one tool of the Lean philosophy. 5S philosophy has been accepted as foundation for lean manufacturing, since it facilitates the manufacturing organisations to establish the system and operational stability required for securing and sustaining various lean manufacturing continuous improvement drives successfully (Brady Worldwide Inc., 2008). Sustainable manufacturing has often referred to as eco-efficiency, remanufacturing, green technology, cleaner production etc. 5S leads to improving the order and cleanliness and creating comfort and a safe working environment. The aim is to increase the productivity of labour. At the same time all the non-value adding actions, such as the time used for searching, should be cut out. 5S is an integral step towards kaizen and lean-site manufacturing with the primary goal of being able to supply the customer (internal, external) with the 'right product' at the 'right time' in the correct quantities. 5S has been envisaged as a philosophy for affecting continuous improvements in workplace productivity, quality, throughput and safety. Need of 5S in industry In contemporary competitive environment, industry has to increase its demand without increasing the sale price of their product. This has forced the manufacturing and service organisations to improve the effectiveness of production and other related operations to improve the bottom line by reducing their costs. Thus to achieve the aforesaid targets, there is an emergent need of holistic adopting 5S principles in the industry. 5S has emerged as an effective foundation for various lean manufacturing improvement drives for eliminating waste from the manufacturing process and improve the organisation's bottom line by affecting sustained improvement in organisational functions. Within a pure Six Sigma project where the savings are typically affected by a non-conforming product or service and customer dissatisfaction, the Lean tools commonly used are 5S, poka-yoke, visual control management, SMED, TPM and value stream mapping. 5S initiatives provide an organisation with the framework and discipline needed to successfully implement various lean manufacturing continuous improvement initiatives. The four key objectives of a 5S deployment program include: developing kaizen-minded people at workplace; evolving teamwork through entire workforce participation; developing managers and supervisors for practical leadership; and improving infrastructure for adoption of advanced kaizen

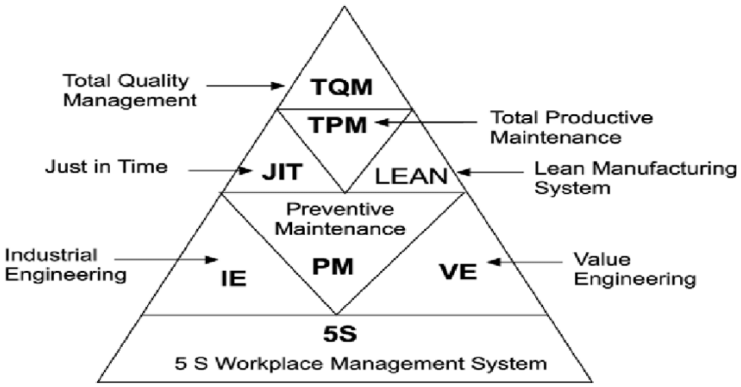


Fig 2 - 5S as a foundation for various lean manufacturing techniques

B. Overview of 5s

The 5S methodology is based on five key principles:

1) *Sort:* This involves sorting through everything in the workplace and removing anything that is not needed. This includes tools, equipment, materials, and other items that are not necessary for the work being done.
2) *Set in Order:* Once everything has been sorted, the next step is to organize the remaining items in a logical and efficient manner. This includes creating designated storage areas, labelling items, and arranging everything so that it is easy to find and access.
3) *Shine:* This involves cleaning and maintaining the workplace to keep it in good condition. This includes regular cleaning, inspection, and maintenance of equipment and facilities
4) *Standardize:* Once the workplace has been organized and cleaned, the next step is to establish standardized processes and procedures for maintaining the 5S system. This includes developing checklists, training employees, and establishing regular audits to ensure that everything is being maintained according to the established standards.
5) *Sustain:* The final step is to create a culture of continuous improvement, where everyone in the workplace is committed to maintaining the 5S system and continuously looking for ways to improve it

C. Tangible benefits OF 5S 5S

Operation model brings a lot of benefits. Some of those are economical and some improves human capital.

The results of strategic 5S implementation can be seen in staff, environment, quality, production and offices. The significant measurable benefits realised through 5S programme are depicted below:

1) Upgradation of productivity and the quality of actions.
2) Reduction in work in-processes and shorten lead-times.
3) Safer shop floor and office operation due to reduced accidents and unsafe situations.
4) Generation of more and better ideas through visible results.
5) Decreasing searching times and costs.
6) Improvement in equipment reliability and maintainability leading to enhanced quality and productivity.
7) Optimum economy in equipment and management for the entire life of the equipment.
8) Cultivating equipment-related expertise among operators and skills among operators.
9) Decreasing searching times and costs.
10) Improvement in equipment reliability and maintainability leading to enhanced quality and productivity.
11) Optimum economy in equipment and management for the entire life of the equipment.
12) Cultivating equipment-related expertise among operators and skills among operators.

D. Drill Machine assembly and store layout

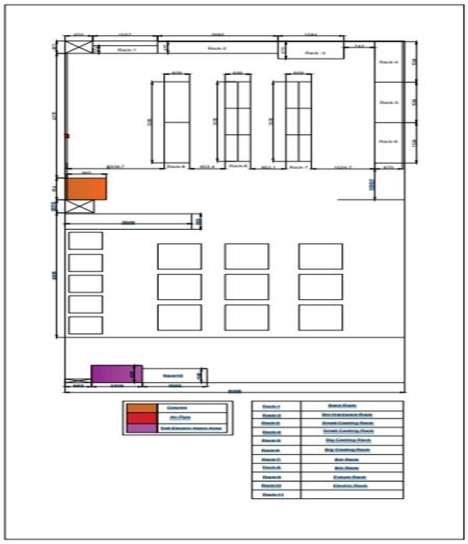


Fig. 3 Drill Machine assembly and store layout

Fig. 3 We have designed the layout according to the material quantity, size, by measuring the store area, we had done use of AutoCAD software, Microsoft Word for material sorting and arrangement and many more.

IV. RESULT

A. Before Searching time Saved

3 min x 7 hours = 21min x 24 days = 504 min x 288 = 1,45,152 min saved / year. Now after implementation of "5S"

1.5 x 7 hours = 10.5 min x 24 days = 252 min x 72,576 min saved now.

B. Before Searching Time Saved

12*7 feet is work space is saved for work

& The Area in sq. ft is 84 sq./ft

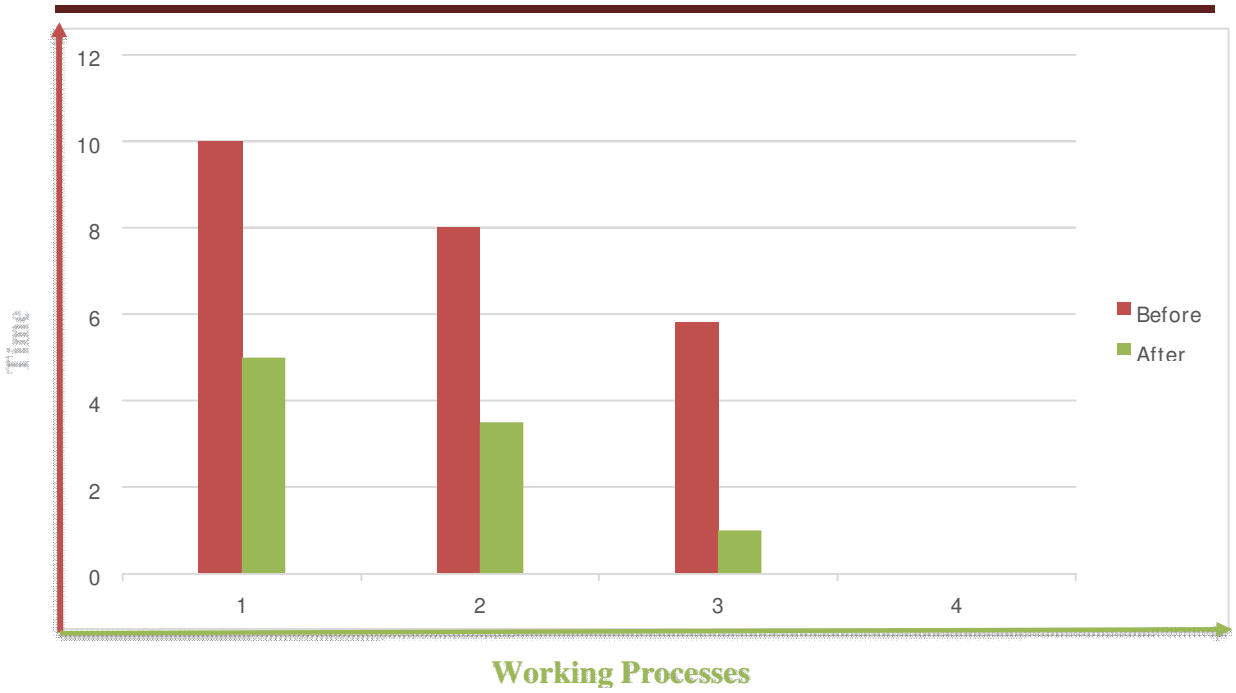
Result Table

7hrs/Days	Hours	Before 5S Implementation	After 5S Implementation	Saved
Month 24 days	7hrs/day	21 min (6.35 hrs)	10.7 min (6.17 hrs)	12.6
Year (288 days)	168 hours	8.4 hrs	4.2 hrs	5.04 hrs
Salary	2016 hrs	100.8 hrs	50.4 hrs	40.32 hrs
				2,520 Rs

Table 1

By Implementing of 5S we have reduce the searching time, walking distance, time, salary per day of the minutes and many more.

B. Graphical Representation of Result



V. CONCLUSION

we are proud to say that the project we did, entitled "implementation of quality tool in store management system in Small scale manufacturing industry Nashik," to improve their production time and reduce their search time of different parts of drill machine assembly, and to save the place in drill machine assembly area, is successfully completed.

VI. ACKNOWLEDGMENT

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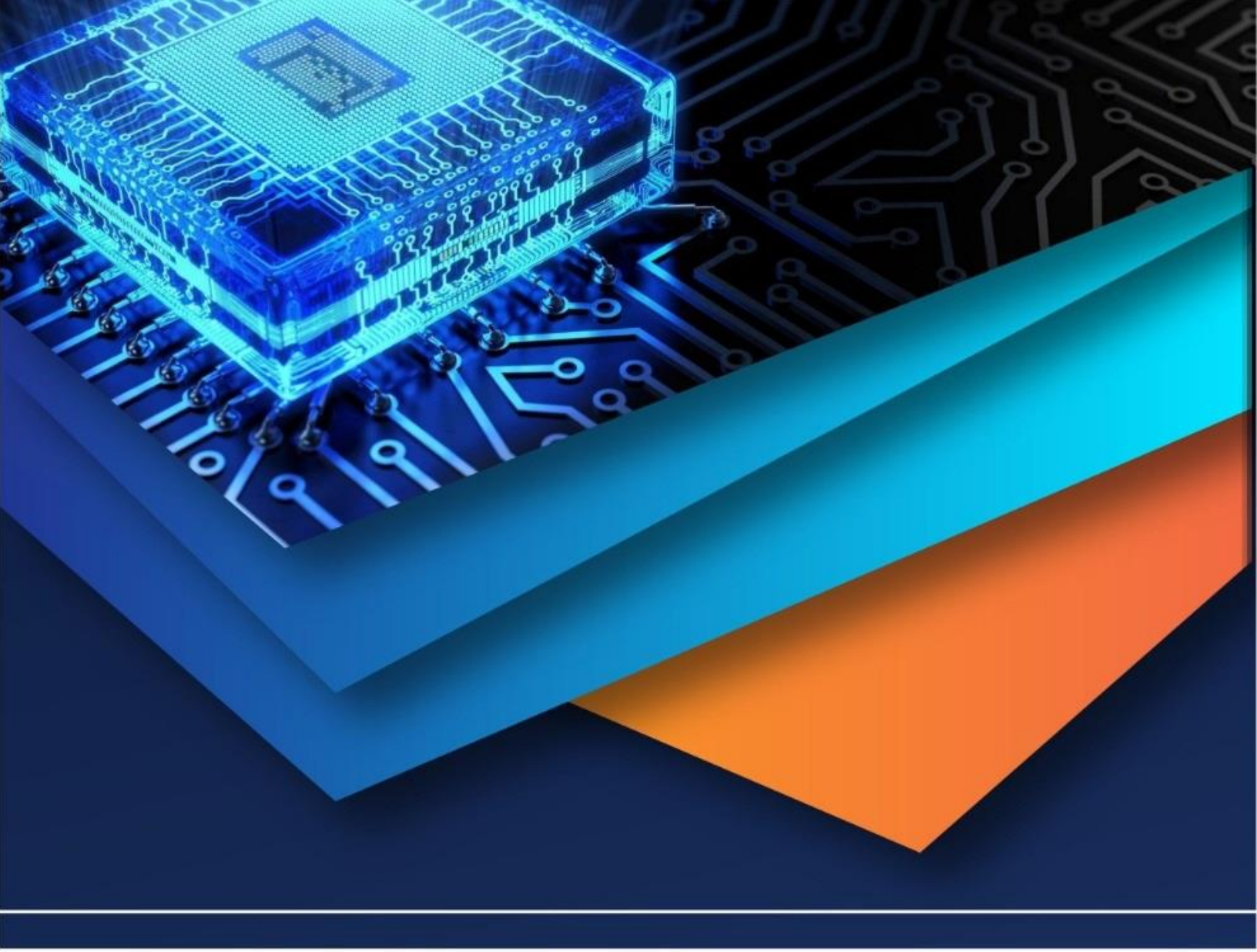

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