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Review on Implementation of 5S in Various Organization

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ABSTRACT
This paper explains the methods and techniques of 5 S uses to increase the efficiency of all processes in the company. Special emphasis will be given to the implementation of 5S system and elimination of losses in the company. It can be observed that introducing the 5S rules bring the great changes in the company, for example: process improvement by costs' reduction, increasing of effectiveness and efficiency in the processes, maintenance and improvement of the machines' efficiency, safety, security, quality and reduction of the industry pollution, proceedings according to decisions. The 5S methodology permits to analyze the processes running on the workplace and establishment of 5Ssustaining well organized, clean, high effective and high quality workplace. Research clearly show, that very essential is training of workers about the 5S rules. Essential thing is to divide activities on some main steps and to maintain the continuous improvement. This method can be used in all companies. Its result is the effective organization of the workplace.
Keywords **–** 5S implementation, elimination of waste, quality improvement.

I. INTRODUCTION

5S is a technique originated from Japan and it was first developed by Hiroyuki Hirano. It include five words Seiri, Seiton, Seiso, Seiketsu and Shitsuke, which means Sort, Set in order, Shine, Standardize and Sustain respectively. The 5S technique is included within 'Kaizen' which means 'change for the better'. It allows the enhancement of efficiency and productivity. The 5S technique is a structured program to systematically achieve total organization cleanliness, and standardization in the workplace. The benefit of 5S technique is improvement in productivity, quality, health and safety [1, 6, 7, 12]. Term of 5S given as:
SEIR(sort): the removal of all unwanted, unnecessary, and unrelated materials in the workplace.

SEITON(set in order): This step consists of putting everything in an assigned place so that it can be accessed or retrieved quickly as well as returned in that same place quickly.

SEISO(shine/clean): It is consists of cleaning up the workplace and giving it a 'shine'.

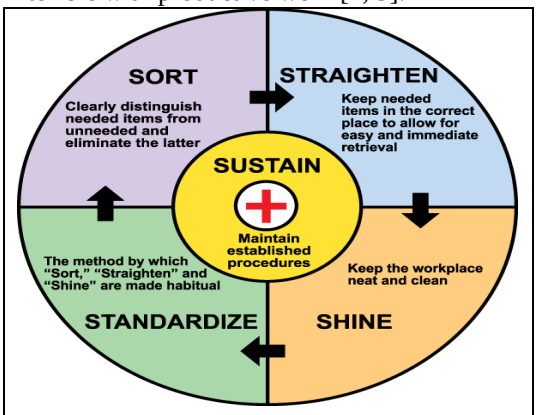
SEIKETSU(standardize): It defining the standards by which personnel must measure and maintain cleanliness.

SHITSUKE(sustain): This last step is about 'Discipline.' It maintain orderliness and to practice the first 4 S as a way of life the introduction of the paper should explain the nature of the problem, previous work, purpose, and the contribution of the paper. The contents of each section may be provided to understand easily about the paper.

II. 5S METHODOLOGY

SEIRI

The necessary and unnecessary materials available in the workplace should be sorted and classified [2]. Through the suitable sorting it can be identified the materials, tools, equipment and necessary information for realization the tasks [6, 13]. Sort by the tools that are frequently used are placed within easy reach, and those that are not used often [8]. This leads to fewer hazards and less clutter to interfere with productive work [7, 9].



Methodology of 5 S

The 1S rules proceedings [6]:

A) On the first stage one should answer to so-called Control Questions:

- Are unnecessary things causing the mess in the workplace?
- Are unnecessary remainders of materials thrown anywhere in the workplace?
- Do tools or remainders of materials to production lie on the floor (in the workplace)?
- Are all necessary things sorted, classified, described and possess the own place?
- Are all measuring tools properly classified and kept?

On the basis of the answer to the above questions it is possible the estimation of the workplace in terms of the 1S rule so littering the workplace. If on any question answer is yes, it should execute sorting of things, which are in the workplace.

B) On the second stage one should execute the review of all things which are in the workplace and group them according to the definite system. According to carried out sorting it should execute the elimination from the workplace the things, which were found "unnecessary".

C) To permanent usage the 1S rule is so-called the Programmed of the Red Label. It means giving the red label to things, which operator will recognize as useless.

BENEFIT:

- process improvement by costs' reduction,
- stock decreasing,
- better usage of the working area,
- prevention of losing tools,

SEITON

This means preparing the necessary items neatly and systematically so that they can easily be taken and returned in the original place after use [1,14]. Forming a regular workplace, avoiding time loss while searching for material and so improving the efficiency are the main objectives [2,10]. The goal is to minimize the number of moves that a worker has to perform during operation [8]. Especially important is visualization of the workplace eg. painting the floor helps to identify the places of storage of each material or transport ways, drawing out the shapes of tools makes possible the quick putting aside them on the constant places, colouring labels permit to identify the material, spare parts or documents[6]. Tools, equipment, and materials must be systematically arranged for the easiest and the most efficient access. There must be a place for everything, and everything must be in its place [7, 9].

Implementing the 2S rule [7]:

It should execute the segregation of things and mark the places of their storing. Used things should always be divided on these, which should be:

- In close access (1st degree sphere),
- Accessible (2nd degree sphere),
- In the range of hand (3rd degree sphere).

To the estimation of the workplace in terms of the 2S rule that is setting in order things serve the following Control Questions:

- Is position (location) of the main passages and places of storing clearly marked?
- Are tools segregated on these to regular uses and on specialist tools?
- Are all transport palettes stored on the proper heights?
- Is anything kept in the area of devices against the fire?
- Has the floor any irregularity, cracks or causes other difficulties for the operator's movement?

Things used occasionally and seldom should be on the workplace but outside the direct using sphere. Their distance and location from the place of work should depend on the frequency of using these materials or tools. Places of storage should be marked in the manner making possible their quick identification. It can be used coloured lines, signs or tool boards.

BENEFIT:

- process improvement (increasing of effectiveness and efficiency),
- shortening of the time of seeking necessary things,
- safety improvement

SEISO

In order to realize effective tasks, it is essential to create a clean and regular working and living environment. This is because dust, dirt and wastes are the source of untidiness, indiscipline, inefficiency, faulty production and work accidents [2, 10]. Cleaning should become a daily activity. Work place should be cleaned at regular intervals [9]. To help identify dust lean factory floors, often painted in bright colors and enhance the light sources within the plant [8].

Implementing the 3S rule [9]:

The first step of realization the 3S rule is renovation the workplace. It is assumed that "the first cleaning" forces the exact checking of usage two of the previous rules. The usage of the 3S rule relies on everyday keeping in faultless cleanness the workplace. It is executed by the operator of the given workplace. To the estimation of the workplace in terms of the 3S rule, that is cleaning the workplace, serve the following Control Questions:

- Are the oil's stains, dust or remains of metal found around the position, machine, on the floor?
- Is machine clean?
- Are lines, pipes etc. clean, will they demand repairing?
- Are pipe outlets of oils not clogged by some dirt?

- Are sources of light clean?

BENEFITS:

- increasing of machines' efficiency,
- maintenance the cleanness of devices,
- efficiency,
- keep the clean workplace, easy to check,
- quick informing about damages (potential sources of damages),
- Improvement of the work environment, elimination of the accidents' reasons.

SEIKETSU

To establish standards of the best practice in the workplace and to ensure that the standards are compiled and to undertaking that the workplace is clean and tidy at all times [1]. The necessary systems are formed in order to maintain the continuance of these good practices at the workplace. Worked out and implemented standards in the form of procedures and instructions permit to keep the order on the workplaces. Standards should be very communicative, clear and easy to understand [6, 10]. Basic housekeeping standards apply everywhere in the facility. Everyone knows exactly what the responsibilities are. Housekeeping duties are part of regular work routines [7]. There is a need after some period to choose the best ways to practice sort, set in order and cleaning and abide by them [8].

To implementing 4 S rules (seiketsu) [1]:

To maintain high standard of housekeeping

- is attention given to keep workplace neat and clean?
- is workplace tidy but not completely clean?

BENEFITS:

- safety increasing and reduction of the industry pollution,
- working out the procedures defining the course of processes

SHITSUKE

Train employees disciplined for practicing 5S system continuously so that the habits and culture within the organization [1,14]. The task here is undertaken by the leader directors. The directors should explain the importance of 5S to the personnel through various trainings and the knowledge of the personnel about 5S should be kept updated through the 5S boards to be formed at the workplace [2]. To maintaining the standards and keeping the facility in safe and efficient order day after day, year after year [7].

It is also important to understand the need of executing the routine inspections of usage the 5S rule. This inspection is executed by helping of so-called Check List and created on its basis the radar graph of the 5S, which serves to estimation of the workplace. The inspection of realization of the 5S rule is executed once a month by chosen team implementing the 5S rule – the control team [3].

BENEFITS:

- increasing of the awareness and morale,
- decreasing of mistakes quantity resulting from the inattention,
- proceedings according to decisions,
- Improvement of the internal communication processes,
- Improvement of the inter-human relations.

III. ADVANTAGES OF 5S IMPLEMENTATION

The successful implementation and execution of the 5S principles in various organizations results several advantages as mentioned following.

1. 5S concept is very simple and easily understood by everyone because this only requires knowledge of the conventional discipline and high commitment. This practice can be implemented at all levels.
2. 5S will foster teamwork, discipline and will increase the sense of responsibility and compassion for company.
3. 5S will create clean, productive work environments and secure the delivery system towards a world-class.
4. On-going commitment from management and involvement are the cornerstone of all citizens for the successful implementation of 5S practices.
5. 5S is an on-going need to maintain excellent service delivery performance.
6. Assessment of Internal Audit will normally move the organization to continually repair the quality and effectiveness of services delivered to customers. Activities are planned and on-going audit to help people to be prepared to face the real 5S audits by the MPC to obtain and maintain certification of 5S.

IV. REVIEWS OF PAPER:

Shahryar Sorooshian *etal.*(2012) They have experienced of implementing a 5S program and paper involves presentation of a real case study, specifically the influence of 5S on some basic work environment problems and the compensation power on the choice of implementation of 5S. This paper is simply representation of basic information with all pros and cons about the concept of 5S. [1]

Derya Sevim Korkut *etal.* (2009) This study involves 5S system for ensuring order and discipline in the companies and ensuring the supervision of both simple and even the smallest details, has been reviewed in full details and they have been taken under the content of the research through selecting

the assembly department as pilot department for 5S activities which is applied at a yacht manufacturing company. 5S activities have been conducted during 28 weeks in the assembly department of the survey subject company. The obtained results are evaluated and it has been observed that the company came to a point better than the initial status. The clearly seen of the weekly results hang on 5S acknowledgment boards within the company by all personnel played an efficient role and involvement in the process. 5S approach is not a study covering a certain period of time rather it is a method defending the requirement of the standardization and continuation of all improvements need to be perform. [2]

J. Michalska *etal.* (2007) In this paper 5S implementation results in increasing of an efficiency, safety and reduction of the industry pollution. The proceedings to research clearly show that training of workers about the 5S rules is very essential. The important task is to divide activities on some main steps and to maintain the continuous improvement. It is also important to understand the need of executing the routine inspections of usage the 5S rule. This inspection is executed by helping of so-called check list and created on its basis the radar graph of the 5S, which serves to estimation of the workplace. [3]

Arash Ghodrati *etal.* (2013) This paper is aimed to determine performance factors and characteristics in industrial organizations and identifying the effectiveness of 5S implementation on organizational performance as well. Surveying method is used and data collection is carried out by distributing questionnaire among five target organizations which have implemented 5S techniques. The target organizations are chosen from different industries and diverse field of work. The results of this research obtained from a comparative measurement of organizational performance before and after 5S implementation. The results show that 5S is an effective tool for improvement of organizational performance, regardless of organization type, size, its production or its service. Consequently, 5S techniques would strongly support the objectives of organization to achieve continuous improvement and higher performance, identifying effectiveness of 5S implementation on the organization performance, has been achieved by using a comparative measurement between performance of organization before and after 5S implementation assisted by SPSS and Excel software. Finally it is concluded that 5S has positive effect on overall performance and could improve the quality, efficiency and productivity of industrial organizations. [4]

Jose H. Ablanedo-Rosas *etal.* (2010) In this paper results of an empirical study applied to some Mexican organizations with the aim of understanding their implementation experience, empirical relationships, and ongoing challenges associated with the 5S practice are elaborated. The 5S practice is used as the basis for advanced quality and continuous improvement philosophies and the organisation measures the benefits from 5S implementation such as quality improvement. The 5S practice is worthwhile for production and service organisations and is universal to all organisations. The big challenge is how to incorporate the 5S practice in everyone's (employee's) life. [5]

Prof. S. B. Khedkar *etal.* (2012) This research is dealt with the implementation of 5S methodology in the S. P. Plastic Industry MIDC, Hingna Road, Nagpur 16. 5S implementation impacts the instructors and workman of industry that work within the selected place. By following the 5S methodology, this research effort shows significant improvements to safety, productivity, efficiency, morale and housekeeping. The research documents improvements by using before and after pictures. [6]

Ravinder Kumar Panchal *etal.* (2012) This paper focus on the methodology adopted in 5S and implementation of the same in the production industry. The 5S rules bring the great changes in the company, for example: process improvement by costs' reduction, increasing of effectiveness and efficiency in the processes, maintenance and improvement of the machines' efficiency, safety increasing and reduction of the industry pollution and waste. [7]

Marko Milosevic *etall* (2013) This paper explain the methods and techniques of lean concept which uses to increase the efficiency of all processes in the company. Also show the results of the level of implementation this method in international and domestic production companies. It can conclude that large companies pay much attention to "lean" concept, both because productivity, and the satisfaction of their employees. [8]

Harsha Lingareddy *etal.* (2013) This paper involves the study and change in the work place of a manufacturing industry to implementation of 5S. This strategy helps in minimizing the time of manufacturing and also increases the area of work place. The solution found by 5S approach solely minimizes several kinds of wastes in the production process and which finally helps in the development of the organization. An Inspection process has been executed on the basis of 5S check lists and the results analyzed to confirm great changes like increasing efficiency in production and quality, improves safety. [9]

P. M. Rojasra *etal.* (2012) This paper explain the implementation of 5S methodology in the Krishna Plastic Company, Udhyognagar, Amreli, Gujarat. Out of the available various lean

manufacturing techniques, 5S offers good potential for required improvement. Ten week study is carried out in the company. The results after the 5S implementations states that production system efficiency is improved from 67% to 88.8% in the successive week. [10]

Mohammad Rasouli Dizaji *etal.* (2013) This paper includes research conducted at Tabriz- IDEM company in the Iran. For gathering required data, they have used three kinds of questionnaires that each one investigates the related area. The result shows that the company has successful actions in employing and implementation of 5S, Ergonomics and executing TPM and also their relations are meaningful. [11]

R.T. Salunkhe *etal.* (2011) In this paper, the objective of spare part management is to ensure the availability of spares for maintenance in minimum time with the help of different management techniques like 5s system, Kanban system and different Kaizens. The 5s system helps to understand the actual condition of spares in store department. It also helps to manage the spare parts effectively giving satisfactory results. The result shows that the improvement in reduction of searching time and also control the cost of inventory significantly accomplished through 5s, Kanban and kaizen systems. The searching time is reduced from 10 - 15 min. to 6 - 8 min. [12]

Gheorghe Dulhai *etal.* (2008) This paper presents a continuous improvement strategy, process-oriented and aiming to improve manufacturing at auto car exhaust. The improvement of auto car exhausts quality, using the "5S" rules, is accomplished at the initiative of the inferior levels of the organization coordinated and helped by the superior management. The efficient implementation of the „5S" strategy leads to a subsequent improvement of the exhaust's quality. [13]

Kaushik Kumar *etal.* (2012) In this paper, the steps undertaken for the implementation of the 5S emphasizing on the benefits to the organisation. The successful implementation of 5S requires that everyone understand why it is being used and what the expected results are, as the removal of familiar (although unneeded) items and the reorganisation of processes can be extremely unsettling. [14]

V. REVIEW REMARKS

The recommendation to implement 5S

1. To make the 5S practices more influential the top management are required to fully support this activity all through the company. In order to make the top management aware of the effectiveness of the 5S, they have to be shown the performance of product quality of this approach.
2. The organization should institute a system of benchmarking with other companies which are successful and make reference on a regular basis with the member of the Quality Team which will provide assistance to the companies in terms of further comprehending its vision and mission.
3. The involvement of all employees in the all departments in the program 5S. All staff should understand the five good reasons 5S program should be practiced at the workplace as it will result in a clean workplace with higher productivity, having a high quality, reducing cost, to ensure timely delivery and consequently, it is a safe workplace.

VI. CONCLUSION

The study these papers demonstrates the efficient implementation of 5S technique leads to subsequent improvement in productivity of the manufacturing company. 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 organization in many ways for instance. The implementation of the 5S system of rules leads to the following effects regarding the improvement in quality:

- Visible results within a short period of time (2-3 weeks),
- Workers get used to order and discipline,
- Labelling draws attention to change that is about to occur,
- Reduction of physical effort, less accidents during the production process,
- Increase of the workers' professional training, better organization of activities.

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