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# Implementation of 5S Methodology in Construction Industry

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**Abstract -** 5S, an established framework for maintaining cleanliness, organization, safety, and sustainability within an industrial setting, has been found to be an effective strategy for preserving the condition of a construction company's premises. The 5S approach has been demonstrated to enhance efficiency at work, minimize waste and mishaps, and better the general atmosphere of the workplace. The advantages of 5S extend beyond the confines of the workplace; it has been demonstrated to improve the standard of living for individuals residing and working in the facility, and has also been shown to positively affect the broader community. This document aims to offer a concise overview of the 5S method, its history, development, and its current status within the construction sector. The paper focuses on the implementation of the 5s methodology in a small-scale industry, demonstrating significant improvements in safety, productivity, efficiency, and housekeeping through the use of before-and-after pictures. Additionally, it aims to instill a stronger work ethic within management and workers, utilizing value stream mapping to identify waste sources and implement lean tools, ultimately showcasing the implementation of lean philosophy through layout modification.

***Key Words*:** 5S, demonstrated, broader, mishaps,

## 1.INTRODUCTION

Lean Construction is a strategic approach focused on cost reduction, efficient material management, and streamlining construction site processes. The primary objective is to optimize project value and outcomes by eliminating superfluous elements and delays. This goal is accomplished through the implementation of sound construction principles, thorough comprehension of project data, and proficient management and planning. When standard construction methods are combined with a clear understanding of project data and effective management, it becomes possible to achieve project goals without unnecessary complexities. By utilizing clever planning and action, the management team, along with the support of all workers, engineers, and contractors, can successfully accomplish their objectives. In the context of lean construction, 5S represents a structured management approach that spans from the company's floor space to the execution of tasks, focusing not just on cleanliness but also on enhancing flexibility and efficiency. It's a framework that is built on the principles of developing skills and value through specific strategies and tools. This approach includes waste monitoring, analysis, involvement, and the process of eliminating waste. Additionally, 5S is sometimes referred to as 5S or Five S, which are the names of five Japanese terms used to describe the comprehensive 5S system. Seiri (Sort). Sometimes 5S use as 5S or Five S, which are five Japanese name used to explain the entire 5S system. Each and every term of this concept starts with an S. In Japanese, the five S's are:

A. Seiri (Sort)

B. Seiton (Set in Order)

C. Seiso (Shine)

D. Seiketsu (Standardize)

E. Shitsuke (Sustain)

## 2. LITERATURE REVIEW

P. M. Rojasra et al (2013) described the development of key areas, which could be used to adopt and implement the lean manufacturing practice and also presented some of the techniques to evaluate and reduce the resources needed on projects resulting in enhanced production efficiency [8]. The prime aim of this study was to implement 5S methodology and measure the performance improvement in Krishna Plastic Company, which is a small-scale industry situated at Amreli, Gujarat. It shows that a small manufacture can rapidly increase output and reduce quality threats by 80%. Also, it presents methodology for determining the real problem connected with industries in implementation of lean. Author also presented selection of required lean tools in the light of company's long-term vision.

Palaniappan (2010) described the performance and benefits of small scale manufacturing industry in India.

Small scale industries form an important sector constituting 40% of the total output to the privet sector and much more significant is the employment generation capacity of small scale sector.

Chauhan et al. (2010) shows the problem to sustain in global market for an organization. Lean manufacturing is hymn of survival and success of any organization. The goal of lean manufacturing is to minimize all types of waste so cost of the product can be reduced.

## 3.OBJECTIVE

- Assess the extent of understanding of the lean concept among professionals engaged in Industrialized Building System (IBS) and Conventional construction methods.
- Explore the principles of lean construction and its application in the construction industry at a local level.
- Compare and analyze the obstacles faced in implementing lean construction in both IBS and Conventional construction approaches
- Eliminate unnecessary waste in construction processes

## 4.METHODS

About the research methodology, in this paper is the review of relevant available literature and industry case studies relating to lean construction implementation in India. In-depth exploration and review of research publications on lean construction implementation was carried out in this paper. Case study method, it is an exploratory study. its applicability in Indian construction industry by using Five-S model. L & T is pioneer in adopting latest associated with the Toyota manufacturing system as originally applied within the Japanese car industry (Womack et al. 1990). Lean construction is beneficial for productivity enhancement as Flanagan et al. (1998) and Saad and Jones (1998) have also recommended the use of lean thinking to construction industry.

### History of 5'S Methodology

5S was developed in JAPAN. Japanese companies were getting more success using 5S concept, thirty years ago researchers started studying the secret of successes of Japanese manufacturing companies 5S turned out to be the most impressive secrete. The factories were so well organized. Two major formworks for understanding and applying 5S to business environments have arisen, one proposed by Osada, the other by Hirano. Hirano provided a structure for improvement programs with a series of identifiable steps, each building on its predecessor. As noted by john bicheno, toyota"s adoption of the hirano approach was „4S" with seitan and seiso combined.
5S is typically associated with other key industry tools such as, kaizen, lean manufacturing and continuous improvement programs. However, it can stand alone and will work in any environment, e.g. the workplace, your home, your PC and even in your own head 5S is a philosophy and a way of organizing and managing the workplace, especially a shared workplace (like a shop floor or an office space) and keeping it organized. 5S is a system to improve efficiency by eliminating waste, improving flow, reducing process unreasonableness and optimizing productivity through maintaining an orderly workplace and using visual cues to achieve more consistent operational results. 5S is a method of cleaning up and organizing the workplace using its existing configuration. The key targets of 5S are workplace morale and efficiency.

## IMPLEMENTATION

### 1.SEIRI (SORT OUT)

Seiri, or sorting, is the initial phase of the 5S method. It involves organizing the mess from the other objects in the workspace that are truly necessary. At this point, the team must eliminate any items that are obviously not suitable for the workspace and only retain those that are essential for the specific processes involved.

- Remove unnecessary items and dispose of them properly.
- Make work easier by eliminating obstacles.
- Minimize the risk of disruption by avoiding unnecessary items.
- Stop the buildup of unnecessary items.
- Evaluate necessary items with regard to cost or other factors.
- Remove all parts or tools that are not in use.
- Segregate unwanted material from the workplace.
- Need fully skilled supervisor for checking on regular basis.

### 2. SEISO (SHINE)

Seiso, also known as sweeping, involves a meticulous cleaning of the surrounding area, tools, and equipment to bring them back to their original, pristine state. This process is essential in detecting any anomalies, such as an oil leak from a machine onto a newly painted floor

- Clean your workplace completely
- Use cleaning as inspection
- When in place anyone not familiar to the environment must be able to detect problems in 5 seconds within 50 feet.
- Upon completion of work, the workplace must be left in a clean and orderly state
- Cleaning responsibilities shall be delegated to on-site workers, while managers are expected to monitor and oversee the process.
- Assign every person or group of person for Cleaning

### 3. SEITON (SYSTEMIZE)

Seiton or straighten is the process of taking the required items that are remaining after the removal of clutter and arranging them in an efficient manner through the use of ergonomic principles and ensuring that every item "has a place and that everything is in its place."

- Arrange all necessary items so that, they can be easily selected for use
- Prevent loss and waste of time by arranging work station in such a way that all tooling / equipment is in close proximity
- Make it easy to find and pick up necessary items
- This stage involves organizing everything in a designated location for easy access at the construction site.

### 4. SEIKETSU (STANDARDIZE)

The Seiketsu stage of the 5S process involves standardizing the improvements made in the first three stages. This ensures common standards and consistent ways of working are established. Standard work is a core principle of lean manufacturing and critical to sustaining these improvements.

- Maintain orderliness. Maintain everything in order and according to its standards.
- Everything in its right place.
- Every process has a standard.
- Define the standards by which person must measure and maintain cleanliness
- Develop procedures, schedules, practices
- Personnel are trained to detect abnormalities and to correct them immediately

## 5.PROBLEM STATEMENT

The primary challenge faced when trying to implement 5S in the construction industry is the presence of illiterate, unskilled laborers and their negative attitude towards work. Maintaining cleanliness at the construction site is also a significant issue. Additionally, the lack of effective communication between supervisors and laborers makes the implementation of the 5S methodology more challenging. Waste generation at construction sites is high due to the negligence of managers and supervisors, who often shift the responsibility to their subordinates. Since the success of all tasks depends on the laborers, the implementation of 5S is greatly affected. Smaller construction sites are generally uninterested in adopting 5S and other management tools due to the minimal workload and the higher manpower requirements, which ultimately increase the total project cost.

## 6. CONCLUSIONS

We have presented a novel waste management technique in the construction industry in this paper. This technique is specifically designed for the civil industry and has proven to be more efficient than the current methods used in the construction sector. The results from work sampling have shown significant improvements in comparison to the standard daily productivity. Such a situation can greatly contribute to enhancing efficiency in work performance. Managers can effortlessly identify both productive and unproductive time, along with determining the root cause. By conducting a time motion study, any form of waste can be eliminated, leading to the creation of an overall improved work environment for all through the implementation of 5S principles.

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