

Review on 5's Tools for Lean Construction

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ABSTRACT

5s is a basic foundation of lean manufacturing systems. It is a tool for cleaning, sorting, organizing and providing the necessary groundwork for work piece improvement. This paper dealt with the implementation of 5s methodology in the small scale industry. By following the 5s methodology, it shows significant improvements to safety, productivity, efficiency and housekeeping. The improvements before and after 5s implementation is shown by pictures in the paper. It also intends to build a stronger work ethic within the management and workers who would be expected to continue the good practices. Value stream mapping is used to first map the current state used to identify sources of waste and to identify lean tools to eliminate this waste. The future state map is then developed for a system with lean tools applied to it. VSM is a pencil and paper visualization tool that shows the flow of material and information as a product makes its way through the value stream. VSM serves as a starting point to help management, engineers, suppliers, and customers recognize waste and its sources. This paper demonstrates the implementation of lean philosophy through layout modification.

Keyword :-5s Tools, Lean construction, Value Stream Mapping (VSM), Reduce waste, Productivity, Efficiency of work place.

INTRODUCTION

Modern management in the company is not only the quality management system based on the ISO series 9000:2000 standards, but pursuit to the continuous improvement, so this is the philosophy of the Total Quality Management. In the frames of implementation of the Total Quality Management on the operating level more and more popular becomes the idea of so called 5S.

The 5S method begins each programme of improvement. It is the tool for helping the analysis of processes running on the workplace. The 5S is the methodology of creation and maintaining well organized, clean, high effective and high quality workplace. Its result is the effective organization of the workplace, reduction of work's environment, elimination of losses connected with failures and breaks, improvement of the quality and safety of work.

5s is the list of five Japanese words: seiri, seiton, seiso, seiketsu and shitsuke. 5s is a workplace organization technique. it helps create and maintain the efficiency and effectiveness of a work area. it help in increase in productivity.

The philosophy of the 5S has its roots in Japan. Name 5S is the acronym of five Japanese words of the following meanings:

1. Seiri (sort)

Sort means separate all items from the workplace that are not needed and needed for current production (parts, tools, equipment etc).

2. Seiton (set in order)

Set in order means arrange items so they are easy to use, and labeling them so they are easy to find.

3. Seiso (shine)

Shine means cleaning for inspection .Daily cleaning and inspection to understand work conditions.

4. Seiketsu (standardize)

Standardization happens when the first three 5's are properly implemented and maintained. It means developing common methods for consistency.

5. Shitsuke (sustain)

It is not a single separate activity. It use to measure progress and plan for continuous improvement. Determine 5s level of achievement. Analyze results of routine checks.

They all start with the letter "S". The list describes how to organize a work space for efficiency and effectiveness by identifying and storing the items used, maintaining the area and items, and sustaining the new order. The decision-making process usually comes from a dialogue about standardization, which builds understanding among employees of how they should do the work. In some quarters, 5S has become 6S, the sixth element being safety. Other than a specific stand-alone methodology, 5S is frequently viewed as an element of a broader construct known as visual control, visual workplace, or visual factory. Under those (and similar) terminologies, Western companies were applying underlying concepts of 5S before publication, in English, of the formal 5S methodology. Lean construction is a "way to design production systems to minimize waste of materials, time, and effort in order to generate the maximum possible amount of value".

Value stream maps should imitate what actually happens rather than what is supposed to happen so that opportunities for improvement can be identified. Value Stream Mapping is often used in process cycle time improvement projects since it demonstrates exactly how a process operates with detailed timing of step-by-step activities. It is also used for process analysis and improvement by identifying and eliminating time spent on non value-added activities. The lean movement started in the automotive industry (Womack et al., 1990) and has since been widely applied in discrete manufacturing. However, extensions to the (semi-) process industry have been much slower. Companies in several industries are implementing lean practices to keep pace with the competition and achieve better results. In this article, we will focus on how companies can improve their inventory turnover performance through the use of lean practices.

The main purpose of LM is to satisfy customer needs on the highest possible level through the elimination of waste. Some sources of waste are overproduction, faulty products, sub-optimized processes, unnecessary waiting, movement or transportation, and excess inventory. In factories using lean manufacturing, large machines characteristic of batch-and-queue processes (typically referred to as "monuments") are often no longer aligned with lean work cells and are not needed or desired. Instead, smaller more flexible machines are typically organized into work cells dedicated to the production of a family of products. Workers then operate the machines in the cell to minimize the cycle time for a family of products, minimize inventory, and maximize value. VSM is an activity improvement technique to visualize an entire production process, representing information and material flow, to improve the production process by identifying waste and its sources.



Fig -1: 5S Activity Cycle

PROBLEM STATEMENT

The major problem in implementing 5S in construction industry is illiterate, unskilled labors & also the attitude of labours towards work. Cleanliness is also major problem at construction site. Also due to lack of communication between supervisors & labours the implementing of 5s methodology is becomes difficult. At construction site waste generation is more, due to negligence of managers, supervisors towards works, also transfer the responsibility to the subordinates.

All the work are depends upon labours. So, it affects the implementation of 5s. Small construction site are not interested in implementing 5s & other managements tools due to less work involved & also requirement of manpower for implementation is more which increase cost of total project.

OBJECTIVE

- To study the concept of lean construction & how is it being implied in the local construction industry.
- The implementation of useful tools for creating an effective work environment without bothersome and useless influences.
- To identify the level of knowledge on lean concept among professionals involved in Industrialized , Building System (IBS) and Conventional type of construction.
- To identify and compare the potential barriers in implementation of lean construction in IBS and Conventional type of construction.
- To observed proper practices & continuously improve them.
- To eliminate the wastes.

ADVANTAGES

Following are the various advantages of using 5's tools in construction,

- Quality of work improved
- Minimum waste generation
- Better safety
- Productivity enhanced
- Provide immediate result
- Greater customer satisfaction

OBSERVATION TABLE

Following are the example of work sampling of plastering work (actual site observations)

Sr .No.	TIME		DESCRIPTION OF WORK	QTY. OF WORK	REMARK
	Start	End			
			PLASTERING		<i>floor No.06</i>
1	10.00	12.15	(wall 1) A	10.12 m ²	
2	12.30	1.00	(wall 1) B	2.42 m ²	
3	1.00	2.00	lunch		
4	2.15	3.38	(wall 3)	5.72 m ²	
5	3.52	5.10	(wall 4)	3.5 m ²	

Table -1: Observation sheet of plastering work

Sr. No	Transportation of material (Mason)	Working (Mason)	Mixing (Mason)	Wastage of Time
1	1 (Wall -1)	2 (Wall -1)	1 (Wall -1)	Taking among themselves
2	1 (Wall 2)	2 (Wall 2)	1 (Wall -2)	Extra time required for finding material water lifting upper floor
3	1 (Wall 3)	2 (Wall 3)		One worker is join to another work

Table -2: Observation sheet of labour for plastering work

CONCLUSIONS

The conclusion of this paper that we have introduce a new technique of waste management in construction industry. This technique is new in civil industry . This technique is efficient than existing technique that are presently use in construction sector. Work sampling result are showing considerable figure as compare to standard daily productivity. This kind of situation can help perform efficient working. Managers can easily identify useful and wasted productive time along with the root cause. Time motion study to remove any kind of waste, and creation of overall better work environment for everyone through 5S.

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