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## **IMPLEMENTATION OF THE 5S SYSTEM AS A FACTOR FOR IMPROVING THE QUALITY MANAGEMENT**

**Abstract:** This paper will explain the methods and techniques of lean concept which uses to increase the efficiency of all processes in the company. Then will explain the steps of the implementation. Special emphasis will be given to the implementation of 5S system and elimination of losses in the company. Also, the paper will show the results of the level of implementation this method in international and domestic production companies.

**Keywords:** 5S system, lean, production, quality

### **1. INTRODUCTION**

Lean is a business model that delivers far superior performance for customers, employees, shareholders and society at large. Whilst this entails delivering to the customer exactly what is required, it also involves freeing up capacity to deliver more value from existing resources with fewer additional costs [1]. The benefits from Lean are not always obvious [2]. In the last two decades a saturation of performance measurement systems dwelling both on qualitative and quantitative perspectives have emerged [3]. To reliably measure organizational performance, there is a need to adopt a more holistic and comprehensive approach to performance assessment [4].

Womack et al. [5], the basis of a lean enterprise are dynamic, multi-skilled groups. The main part of work and responsibility has been moved to these groups. It is not enough just to create such groups in current formal organization, but responsibility and power have to be moved to those groups also in practice, manifesting support and trust. According to Hilling [6], the second success factor for manufacturing enterprises after leadership

is the product and especially its manufacturability.

Industrial Engineering and Management is a multidisciplinary science that deals with the integration of machines and workers in production systems with one hand, while the other deals with the management of such systems. Management of production systems is very demanding and unpredictable to a certain percentage. Entire company behaves analogously to the human body. Many processes running at the same time with one goal-survival (companies aim, in addition to survival and profit-making). In order to manage production company proceeded successfully, it is necessary to integrate production systems and the people who work at the company. It's a big challenge, because the system requires a thorough understanding and ability to predict the behavior of macro-enterprises. To manage effective manufacturing company, it is necessary to analyze the more information that is generated and based on the findings continuously improve all processes [7].

Lean concept originated in the Toyota Company, which is a very representative example of successful Japanese

companies. The way of Toyota company since the end of World War II until today represents the all specific quality of Japanese companies. Through analysis of lean concept recognizes the uniqueness of all the recent Japanese philosophy and culture, which needed to "lean" concept for the living. Although very simple in theory, these postulates are very difficult to achieve in practice [8].

## **2. BASIC TECHNIQUE OF 5S SYSTEM**

As pointed out, lean production is based on a constant search for losses and its elimination. Value is defined from the customer's point of view. Therefore, all the methods and techniques of lean production aimed at the removal of various types of losses. Some of the key lean tools are just in time, kanban, kaizen, but this paper will focus on the analysis of the 5S system.

5S - a set of rules for organizing the work of each worker. The goal is that every job is organized in such a way so as to be maximally effective and speed up the work of the employee. Since the "lean" originated from Japan, five words in the letter S coming from the Japanese language and they are: "Seiri" - sort, "Seiso" - set in order, "Seiton" - shine, "Seiketsu" - standardized, "Shitsuke" - sustain.

- 1) Sort - Sort and distribute tools. Sort by the tools that are frequently used are placed within easy reach, and those that are not used often.
- 2) Set in order - Set in order things that are important to them is easy access. The goal is to minimize the number of moves that a worker has to perform during operation.
- 3) Shine - To minimize problems with dirt, it is necessary to regularly cleaning machines and jobs. In some industrial processes, dust is one of the causes of bad products or

contaminations were inflicted color. To help identify dust lean factory floors, often painted in bright colors and enhance the light sources within the plant.

- 4) Standardize - previous rules (sort, set in order and shine) should be standardized and printed procedures. There is a need after some period to choose the best ways to practice sort, set in order and cleaning and abide by them.
- 5) Sustain - Maintain 5S culture among employees. Maintain training and make the 5S becomes part of the corporate identity.

## **3. ANALYSIS OF 5S SYSTEM IN PRODUCTION COMPANIES**

This part of paper will show at which level of application of 5S system is at companies which engaged in the production of winches. It will show analysis which the authors of paper have done when they were at one production company in Serbia and in the USA, in April and in September 2012.

Research was conducted using program for the tables, "Ms Office Excel" and consists of a series of questions that closer define the level of implementation of 5S system. Completing the questionnaire was directly accessed at workplace in the workshop. It was doing in such a way that any activity in the questionnaire was assessed from 0 to 5.

### **3.1 Analysis of current status 5S system in international company**

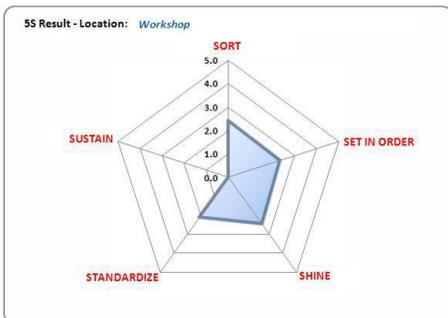
After completing the questionnaire in company in the USA, authors processed the received data, and the average mark for "sort", on interval from 0 to 5 is 2.4.



**Figure 1. Work desk in international company**

Based on this (analytic results and figure 1), it can be concluded that it does not pay enough attention to the classification of necessary and unnecessary equipment and tools.

The other four steps have also done at same way as "sort". Average mark for "set in order" to international company is 2.3, for "shine" is 2.5, for "standardize" is 2.1 and for "sustain" is 0, because the company has not been implemented 5S system, so it did not do anything on last step - "sustain".



**Figure 2. Graphic of total results of company from USA**

On figure 2, we can see graphically presented results of all of 5 steps of 5S system in international company.

### 3.2 Analysis of current status 5S system in domestic company

At same way as in the USA, research has done and in Serbian company.

Estimating the current situation, the authors of paper have come to the conclusion that all steps of 5S system did not implement yet, so the level which can see at figure 3 is also average, 2.6 for "sort", 2.4 for "set in order", for "shine" is 2.3, "standardize" is 1.8 and for "sustain" is also 0, as in company from USA because the company has not been implemented 5S system.



**Figure 3. Graphic of total results of company from Serbia**

### 3.3 Analysis of results

In the survey described in the previous two sections, the questionnaire contains questions in the field of 5S system. Evaluations in questionnaire are at volume form 0 (insufficiently) to 5 (extraordinarily). Reviewing and comparing the results obtained both plants, we reach the following values:

**Table 1. Review of obtained results**

	International company	Domestic company
Sort	2.4	2.6
Set in order	2.3	2.4
Shine	2.5	2.3
Standardize	2.1	1.8
Sustain	0	0
Average score	1.9	1.8

Based on research conducted in two production companies, and analysis of the current situation, there are results which show an almost equal level of 5S system implementation. If the overall grade is average (1.9 for "International company" and 1.8 for "Domestic company"), taking into account the interval score (0-5), it can be concluded that in these companies were not organized 5S activities. Main reason for this is that all activities boils down to one or two individuals, which also leads to the conclusion that in these factories for now there are not enough opportunities for improvement.

#### **4. RECOMENDATIONS FOR IMPLEMENTATION OF 5S SYSTEM**

5S system is a cost effective system that aims to clean and organize the work place, in order to improve the level of productivity and efficiency of a company and raise morale and employee satisfaction.

One of the keys to successful 5S system is the full support of management. How to on relatively inexpensive way to implement 5S is necessity of changing the working habits of employees and management.

The first thing it must do in order to effectively introduce the 5S system in a company is to educate all employees. Purchasing handbooks, seminars and training, will approach the matter to workers, and thereby raise their awareness of the importance of such a system operating.

Some of the tools that can assist in the introduction of the system:

- 1) Educational material for 5S. Drawings and examples as a reminder to employees.

- 2) Billboard for 5S. There can stand educational materials, as well as examples of good and bad systems.
- 3) Awards for individuals, groups or teams for their efforts in sustainability and the introduction of the system.
- 4) 5S is a team-oriented system. Each employee allowed presenting their own plans for improvement. No one knows better how to get the job done by someone who works on it.

Before starting with the implementation of the 5S system, management should establish a team of 5S. The team should also be trained. It is necessary for analyzing the state of the company, the way employees work, as far as equipment, tools and materials away from the workplace, whether they are in an ergonomically appropriate position, etc. Only after a detailed analysis, start working on a plan for the implementation of 5S system.

#### **5. CONCLUSION**

This paper is based on the lean philosophy with an emphasis on 5S system, both in the theoretical foundations, and through practical work in an international and domestic company.

Described on the basis of theory and practical work, it can conclude that large companies pay much attention to "lean" concept, both because productivity, and the satisfaction of their employees. It may be concluded that companies which analyzed are still a lot of work and effort to bring this concept to the level of the creator of the concept of operations, Toyota.

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