



6S - SIX STEPS TO INCREASE WORK EFFICIENCY

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Abstract

The paper contains definition of 6S methodology and brief analysis of its individual steps. It explains that this methodology is not only big cleaning, but it is one of the basic pillars of lean philosophy with aim of work efficiency increase. The paper describes practical implementation of this methodology, with real example of 6S standard. In conclusion summarizes some practical benefits reached through implementation of 6S methodology.

Key words

6S, sort, set in order, shine, standardize, sustain, safety, efficiency, lean, visualization, waste elimination.

Introduction

There exists countless number of methods, tools, approaches and concepts to optimize processes and increase their efficiency. Many of them are well known and some are really very simple. In my paper I would like to point out / remind just one such a method. Its name is 6S. This methodology is often overlooked without unnoticed. Perhaps it is because of its simplicity and clarity, or not known / not understood its true meaning. But after implementation of 6S methodology you can often get more than would expect.

Definition of 6S methodology

6S is methodology for increase of work efficiency, improvement of work organization and also working environment itself. All above mentioned 6S achieves especially by elimination of all possible wastes in the workplace.

Waste is everything that does not add value to product or service. It usually increases price that customer is not willing to pay. And that is the reason why it is necessary to remove or eliminate waste as much as possible. In lean terminology waste is called Muda. We can recognize 8 basic types of waste: overproduction, defects, waiting, inappropriate processing, unnecessary inventories, unnecessary / excess motion, transporting and bad / not utilized human potential.

Title 6S came into being by connection of: "6" that is amount of individual steps and "S" that is first letter of all individual steps names of this methodology (Figure 1). 6S methodology can be found also under names like 5S, 5U, 6U and possibly some others. It depends on the country which took over and modified it.

Analysis of individual steps of 6S methodology

This part more detailed analyzes individual steps (Figure 1) of debated methodology, what they should do and what benefits should bring.





Individual steps			••••••••••••••••••••••••••••••••••••••
$1^{st} S$	Seiri	Sort	Separovať
$2^{nd} S$	Seiton	Set in order	Systematizovať
$3^{rd} S$	Seiso	Shine	Stále čistiť
4^{th} S	Seiketsu	Standardize	Štandardizovať
5 th S	Shitsuke	Sustain	Sebadisciplinovanosť
6 th S	Sekyuritī	Safety	Stále klásť dôraz na
			bezpečnosť

Figure 1 Individual steps of 6S methodology

1st S - Sort

Main idea of this step is necessity to distinguish necessary items from unnecessary. The best way how to separate mentioned items is to watch what is happening in the workplace and also cooperate with employees from that workplace. Necessary items then have to be divided into minimally 2 groups. First are required very frequently (on a daily base) to perform operation in the workplace. They have to be located directly in the workplace. Second are also required, but they are not used so often. They have to be repositioned, but easily accessible if needed. All unnecessary (unused and useless) items have to be removed. One my advice is to do a bazaar, what by other words means, that you offer your unnecessary items to the other departments. It is for cost saving, because someone can need what you do not. But, if passes some in advance defined time and no one has taken and used yours offered things, then physically liquidate them, because you do not want to pay money for storage of unnecessary items.

Benefits of this step are for example: more empty space, lower cost of storage, removing unnecessary material, reduction of time loss.

2^{nd} S – Set in order

Main ideas of this step is to determine and stabilize location for each item from 1st S and to ensure finding of all items in their places. That means that items have to be easily, well arranged and their locations clearly labeled and always available. Of course in this point is important to use lean thinking and for example items locate so, as to minimize movements, apply ergonomics rules and so on. Arrangement of items in the workplace is suitable to support with standard of workplace layout, as well as with colour marking lines on the floor.

Benefits of this step are for example: save searching time for items, better survey, easier orientation, faster and easier job trainings, easier and faster work, avoiding nervosity and apathy.

3rd S – Shine

Main idea of this step is to make a cleaning as a part of daily activities. Here is important to define what, when and how often clean, who will do it, which tools will be used and so on. In deeper meaning, to clean means to check. But of course, better than cleaning is do not do the mess, but this is not possible to assure in all situations.

Benefits of this step are for example: good feeling from clean working environment, good impression on visitors of company, easier maintenance, prevention of accidents and illnesses.

4th S - Standardize

Main idea of this step is to summarize and standardize every important thing happened in first three steps. There is created visual standard with all basic rules of the workplace.





There exist a lot of types and examples how the standard should look. I always recommend to adapt visual standard to the needs of each company. Good is also to use photographs in standards. Because of more than 80 % of the information is received by eyesight, visualization is very important support tool for not only this step but for the whole methodology. It is always better to see something once, than three times to hear about it. If you want to be the world's leader in the business, you have to have a look of world class.

Benefits of this step are for example: simply, clearly and concretely defined rules for all.

5th S - Sustain

Main idea of this step is to ensure strict observance of all defined rules and procedures. This step is the hardest part in implementation of this methodology to the practice. It is really difficult to teach and train people to something different, something new. It costs a lot of effort, but effect can be excellent.

The most important point in this step is discipline of everyone. Employees have to follow all rules. Managers and leaders have to be the best examples in rules following and regularly check the status. Support tool for this step is audit.

Benefits of this step are for example: monitoring of defined principles, faster response to the occurrence of the problem, ensure long term sustainability.

6th S - Safety

Main idea of this step is that every improvement made in the workplace may not jeopardize employees. From prevention is important accesability and clear identification of all safety equipments. And goal is to work and to behave so, that you prevent dangerous situations with number of accidents as lowest as possible.

This step was before included in others steps, but because of importance health and safety at work, it was excluded to the separate sixth point.

Benefit of this step is for example: safer working environment.

We could summarize that above discussed steps without doubt support improvement of company culture and people's attitudes, waste elimination, continuous process improvement and ultimately save cost of company. One important point how to better achieve all this mentioned is involvement of everybody – from top managers to "common" employees in the shopfloor. It is important because all these people best know their workplaces. So based on cooperation, discipline and conscientiousness of everybody and lean background we can create very good, improved conditions for our work.

Practical implementation of 6S methodology

Let me describe one simple example of practical implementation of 6S methodology. As an example I can use network cables, which are nowadays used almost everywhere - from homes, administration officies to production areas (for example on testing). If we have a small quantity of cables it is very easy. We can put them somewhere to the box or hang on rack. But when we have for example more than 100 pieces of cables with different length (let say from 0,5 to 30 meters) and in a different situations we need a different length, it starts to be a little bit complicated. Of course we can still put them to the box, but mixed quantities of cables mean no survey and time consuming finding of cable with correct length. If we want to pull them out, the cables can be broken and damaged. We see that the box is already not a good solution in this situation. So we can hang cables on the rack. We solve some issues, but still





there miss some system. Even if we divide them by length, what is a good idea, without some other actions and rules, the status on the rack will not sustain. This situation from practice we can see in Figure 2. There miss a system. And cables are mixed by different lengths and also different types.



Figure 2 Initial status of network cables arrangement

Overall procedure should be as follows. First of all, we have to collect all cables. Check them if they are OK. If some of them are wrong, we have to repair them. Those which are not reparable or not applicable we just throw out. Then cables which are OK have to be cleaned and divided to the groups based on their different lengths. Based on quantities of cables in each group and amount of groups, we define amount of hooks for each cable group. To every group of cables we assign one colour. Afterwards, we prepare schematic layout of cables according to their lengths and colour combinations (Figure 3). We then have to find / purchase coloured adhesive tapes and racks with sufficient amount of hooks.



Figure 3 Schematic layout of cables according to their lengths and colour combinations





Then we can start to implement proposed system into practice. Firstly, we have to find right place where to construct rack(s). In this point we should follow lean thinking way to prevent creation of others potential wastes. Then we clean place where rack will be built and on that place construct rack(s). Based on schematic layout we mark every hook and every cable by right tape. Hooks can be also marked be number of length of cable. Then just hang on cables on hooks, make photographs, prepare the visual 6S standard in which can be incorporated besides schematic of cables hanging other important points concerning manipulation and maintenance of cables. We can put there some photo examples how to hang / do not hang cables, what to do when cables are damaged and so on. One my advice is, if you have other types of cables in which you can use the same system of visualization and hanging, you can put them to the same 6S standard. Please see practical example of 6S standard for optic and network cables racks (Figure 6 and Figure 7). Good is to publish this 6S standard to the shopfloor next to racks. In conclusion of implementation is important to train all concerned employees. During the training is good to take the employees next to the rack and ask them to hang some cables to the rack. Training in the practice is the best one.

What has not been mentioned is that 6S is applicable not only in productions (Figure 4), but also in services and administration offices (Figure 5). Many times 6S solutions are low cost so you do not need to invest a huge amount of money to the improvement.



Figure 4 6S examples for hand tools and equipment



Figure 5 6S example in the office







Figure 6 6S Standard example – page 1







Figure 7 6S Standard example – page 2

Practical benefits from 6S methodology implementation

Without many words, please see some practical results from 6S methodology implementation collected from literature [1-10]:

• reduction of required tools from 350 to 20,





- reduction of working place by 20 40%,
- reduction of searching time by 50%,
- reduction of assembly operation time by 30%,
- reduction of start-up time by 10 15%,
- reduction of inventories in the workplace by 80%,
- saving of 190 km of walking per year by optimized layout of workplace,
- saving of 3 500 m^2 by remove of excess stock, tools and equipments,
- saving of 187 000 \$ yearly costs by searching of brooms,
- identification of 750 000 \$ in excess stock,
- quality improvement by 10 20%.

Conclusion

Unfortunately, I often meet with people who think that 6S is not helpful tool, because it ensures only tidiness and sometimes maybe waste throw out. But, as you can also see in the text above, this is not true. Often problem is that people neither do not want to try this methodology, nor to explain it. And in such a way people lose their easy opportunity to move forward which can be ensured by simple, fast and effective method such as 6S.

Key words

6S, sort, set in order, shine, standardize, sustain, safety, efficiency, lean, visualization, waste elimination.

Literature

[1] BOSENBERG, D. - METZEN, H.: Lean manažment. Náskok pomocou štíhlych konceptov. Slovo, Ivanka pri Dunaji 1997, ISBN 80-85711-16-8,

[2] GREGOR, M. - KOŠTURIAK, J.: Just - in - Time. Výrobná filozofia pre dobrý management. Elita, Bratislava 1994, ISBN 80-85323-64-8,

[3] GREGOR, M. - KOŠTURIAK, J. - KRIŠŤÁK, J.: Meranie a zvyšovanie produktivity. Jozef Blaha, Žilina 1998, ISBN 80-966996-9-5,

[4] HIROYUKI, H.: 5 Pillars of the Visual Workplace. The Sourcebook for 5S Implementation. Productivity Press, New York 1995, ISBN 1-56327-047-1,

[5] IMAI, M.: Kaizen. Metóda, jak zavést úspornejší a flexibilnejší výrobu v podniku. Computer Press, Brno 2008, ISBN 978-80-251-1621-0,

[6] IPA Slovakia: IPA slovník [online], Žilina 2012, Available on the internet: http://www.ipaslovakia.sk/sk/ipa-slovnik/5s,

[7] KOŠTURIAK, J. - GREGOR, M. - MIČIETA, B. - MATUSZEK, J.: Projektovanie výrobných systémov pre 21. storočie. EDIS, Žilina 2000, ISBN 80-7100-553-3,

[8] LIKER, K. J.: The Toyota Way. 14 Management Principles from the World's Greatest Manufacturer. McGraw-Hill, 2004, ISBN 978-80-7261-173-7,

[9] MIČIETA, B.: Prosperujúci podnik. Postupy podporujúce zvyšovanie produktivity a konkurenčnej schopnosti podnikov. Slovenské centrum produktivity, Žilina 2000, ISBN 80-968324-0-9,

[10] MOULDING, E.: 5S A Visual Control System for the Workplace. AuthorHouse, Milton Keynes 2010, ISBN 978-1-4490-2977-7.

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