

# 5S – We are doing it wrong

## READ ABOUT:

5S and why we are doing it wrong

The secrets you need to learn to improve your lean transformation

Associate Professor at NTNU, *Torbjørn Netland* takes a closer look at each of the five S-words, and finds many of us might have missed the point in part one of his two part investigation.



**F**ive short Japanese words, each beginning with an “S”. The majority of employees in the industrial sector, and increasingly in the public sector, have heard about the 5S’s. The problem? The vast majority of companies trying to implement 5S fail, and do so repeatedly. Many mistake it as a concept for cleaning and tidying up, a boring but necessary activity for any professional business.

The 5S’s are seiri, seiton, seiso, seiketsu, and shitsuke. Done right, 5S creates an effective and attractive workplace. It



“The vast majority of companies trying to implement 5S fail, and do so repeatedly”

supports visual control, eases communication, and helps continuous improvement. The indirect effects are higher safety, better product quality, reduced delivery times, reduced process costs, improved worker satisfaction, better environmental performance, and generally improved productivity. Then why do most organisations struggle with 5S? Consider this conversation:

- Seiri, seition, and seiso are important in order maintain the factory, right?

- Yes, keeping the factory in condition of seiketsu is essential for factory management.

The conversation took place in 1965. The person who asked was Shiego Shingo, and the one responding was Taiichi Ohno. It was reported in a manuscript I received from Mr. Kouichi Kimura, a consultant in Japanese production methods. Sharing his life-long experiences, Kimura-san sent me a manuscript of more than 100 pages—only about 5S. In contrast, the usual description of 5S used in industry is a single PowerPoint slide with the approximate English translation “sort”, “straighten”, “shine”, “standardise”, and “sustain”, or similar (see figure one). Could it be important aspects of 5S have been lost in translation?

#### Figure one: 5S lost in translation

There are several English translations of the 5Ss using words starting with “S”. A review of practice and the literature identifies the following attempts:

**Seiri** = sort / separate /structure / scrap

**Seiton** = straighten / set-in-order/ stabilise / simplify / systemise

**Seiso** = shine / scrub / sweep / sanitise / spic and span

**Seiketsu** = standardise / stabilise / schedule

**Shitsuke** = sustain / standardise / self-discipline

Other alternative translations of 5S include “clear out, configure, clean, conform, and custom” (5C) and “cleanup, arrange, neatness, discipline, and ongoing improvement” (CANDO). However, none of these attempts give an accurate translation of the Japanese 5S’s.

#### Figure two: The research

To write this article, I studied the reference material of Kimura-san, reviewed other books and articles on workplace management and 5S, and reached out to four trusted Japanese colleagues: Dr. Kodo Yokozawa works at the Manufacturing Management Research Center of the University of Tokyo, Dr. Ryusuke Kosuge is an associate professor of operations management at Ritsumeikan University, Oita, (prev. assistant professor at the European Institute of Japanese Studies of Stockholm School of Economics), Dr. Hajime Mizuyama is an associate professor of production and operations management at Aoyama Gakuin University, Tokyo, and Mrs. Mieko Igarashi is a PhD candidate of purchasing management at NTNU in Trondheim, Norway.

#### THE FIRST AND SECOND Ss: SEIRI AND SEITON

The first two S’s — seiri (整理) and seiton (整頓) — belong together. The first kanji character (整), which is shared by both words, is a symbol for order. The two second kanji letters (理 and 頓) mean “law / logic / reason” and “settle down / root / arrange” respectively, and modify the meaning of the first symbol. Apparently, Japanese people do not differentiate between Seiri and Seiton in every-day life. One of my Japanese colleagues told me:

*Regarding Seiri and Seiton, we have been taught these two words since we were in elementary school. These two words were almost always used together. These two words were posted in the class room. We used to keep our text books and other writing tools in our desk. We were always asked by the teachers to keep them in order. Then the teachers always asked us to “Seiri-Seiton”.*

Seiri is usually translated to sort. It is about sorting things in an area, deciding what is needed for getting the job done and what is not. Seiton is usually translated to “set-in-order”

“ The concepts of sorting and setting-in-order do not have their origin in Japan. Cavemen were sorting food and firewood thousands of years ago. ”

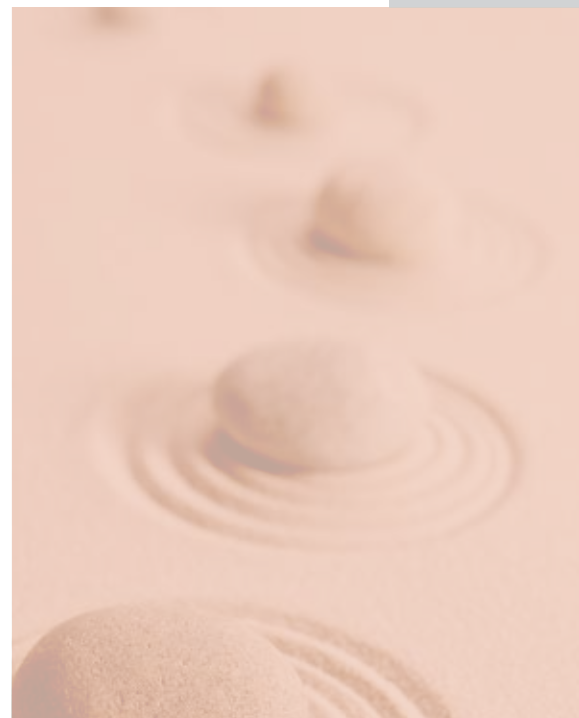
or to “straighten”. It also includes the sequencing and visual labelling of locations. An intuitive and usual slogan is “a place for everything and everything in its place”. An important objective of seiton is to reduce the non-value adding activity of searching for items, tools, and documents. The core meaning of seiri-seiton is to keep only what you soon need close to you, in an orderly, designated place. Such workplace organisation is the foundation of 5S.

The concepts of sorting and setting-in-order do not have their origin in Japan. Cavemen were sorting food and firewood thousands of years ago. When we think of it, the first two S's are really common sense. Three good examples of how excellent seiri-seiton can be in our daily lives are the carpenter's tool belt, the organisation of a dental chair, and the chefs' mise en place (a French term for organising ingredients and utensil for quick access before cooking). In everyday work, the process of putting things back to the right place after you have used them is katazuke, which translates to what all children know as tidying up.

### HOW TO DO IT

Seiri and seiton should be a daily routine, but from time to time companies need to update the standards due to changing conditions. It implies sorting and physically moving items, using standardised labelling and containers. Toyota reportedly organises monthly katazuke campaigns for seiri-seiton. Other firms recommend having a major katazuke event once every six months. The 3Rs are helpful in this regard: The items you need are kept (retain), and the items you do not need get stored for later use (return) or thrown away (rid).

Proper seiri needs a pre-defined standard that sets out the rules for what to retain, return and rid, respectively. What is needed in an area is dependent on time and how frequently it is used, seiri (sorting) is not as easy as one might think. Should you keep the items you need for the next month, next week, next day, or next hour? how many of each item should be kept? Of course, it depends on your volumes, takt times, and product characteristics, but, as a rule of thumb, a two-to-four week time horizon seems



legitimate for deciding what to keep close. In addition, how frequently the item is used must be considered to decide how many of each item should be kept. Unnecessary items in an area can be marked with dated red tags and returned or got rid of if not used before a certain date. Alternatively, a red-tag holding area can be dedicated.

Visual signs, shadow boards and coloured tape can mark off areas and min-max levels for items; what, where and how much. This way it becomes immediately visible to everyone if something is not in its place and according to standard. Keep the retained items close to where they are used; within arm's length distance from the point-of-use is ideal for high-runners. Watch out for ergonomics, and provide lifting aid technology or automation if needed. Keep items used together close to each other. Use standardised right-sized boxes and material carriers, and make spaces that are larger than their containers so handling is easy and efficient. These simple tips will take you closer to seiri-seiton.

Check out part two in October's edition.

A photograph of a Zen garden with several smooth, rounded stones arranged in a line on a bed of sand. Each stone has concentric ripples in the sand around it, creating a sense of depth and focus.

# 5S- We are doing it wrong part 2




In the second part of his two part investigation NTNU associate professor *Torbjørn Netland*, continues to cast an eye over 5S, tells us where we are going wrong and how we can do better.

## THE THIRD AND FOURTH SS: SEISO & SEIKETSU

The two next Ss — Seiso (清掃) and Seiketsu (清潔) — also share their first kanji character, 清, which connotes pure, clear, and/or fresh, and is associated with water. The latter kanji in Seiso, 掃, means “sweep”. The second kanji in Seiketsu, 潔, is a very positive character describing something pure, clean, holy, and/or free of dust and germs. Clearly both of them are related to cleaning. Seiso literally means “cleaning” and Seiketsu is a general term referring to “maintaining cleanliness” (as in good hygiene) and is a very usual expression in Japan

In Japanese primary, secondary and high schools, it is a very common practice that students have daily cleaning time, for example 30 minutes. They clean not only their classrooms, but also shared areas such as the corridors, toilets, entrance, etc. A more common Japanese word for Seiso is “Souji” (掃除). It is one of the fundamental Japanese

A simple grey arrow pointing to the right, located at the bottom of the text block.

customs. An illustrative example: In the 2014 Soccer World Cup in Brazil, the media broadcast pictures of Japanese soccer fans tidying up their seats and sitting areas after the games.

Sticking to the letter S, the English translation of Seiso is often “sweep”, “scrub” or “shine”, even though “cleaning” would arguably be closer. Note that Seiso is not just about brushing and washing, it aims to keep machines, equipment and facilities in a functional, visual and well-maintained state. Because “dust attracts dusts” and “litter stimulates littering”, the absence of Seiso quickly results in an impaired factory.

Seiketsu is often translated to standardise which means maintaining a standard. This might result in wrong interpretations: Seiketsu is not the activity of making work standards (another important element of lean production), but rather the activity of sustaining all the three first Ss. Seiketsu is the ideal status after you have sorted, set-in-order, and cleaned up. In one sense it means creating and maintaining standards for Seiri, Seiton, and Seiso. Seiketsu is the foundation for improvement, well-being of the employees, and effective production. One of my Japanese colleagues, who moved to Europe a few years ago, provides an illustrative example:

*At my kid's school, the kids rarely have opportunities to clean the shared area. Instead, the school hires a janitor for cleaning, and the parents do a big cleaning event twice a year. In Japan, we always think that it is much better to let pupils clean by themselves so that they use the areas with more care and find improvements for a better school environment. To have and keep “Seiketsu” should be a goal in the school.*

## HOW TO DO IT

The cleaning activities of Seiso can typically be carried out at the end of every shift. Five or ten minutes are sufficient. The obvious drawback is that such cleaning routines often mean five or ten minutes of lost production. Therefore,

we should strive to do the cleaning while machines are running. Not cleaning at all is equivalent to never brushing your teeth. It is simply a bad idea. Note that Seiso also includes other activities that help implement the “visual factory”, such as installing sky lights, painting the factory walls in light colours, and replace non-transparent covers with transparent ones. Making the factory more beautiful is important too, but not the main objective of Seiso.

Seiketsu can be achieved by applying a combination of reactive and preventive actions. Reactive actions include practices like regular Gemba walks and scheduled 5S audits with the purpose of identifying areas for Seiri, Seiton and Seiso. These practices are very usual, but require a routine and sustained commitment by the management in order to be effective in the long run (which is why we need the fifth and final S). Weekly or monthly 5S audits are maybe the most used (and misused) lean tools. An obvious risk is that it favors compliance over understanding.

Examples of preventive Seiketsu actions are installing ventilators, air filters, door mats, surface treatment of concrete floors, and so on. The best preventive actions are those that eliminate the cause of unnecessary items, disorder, and dirt altogether. For example, areas where dust enters the factory can be sealed permanently. Also, appropriate wardrobe and canteen facilities may be good preventive actions. Clearly, Seiketsu cannot be achieved by one-off Katazuke campaigns alone, but requires “Kaizen” (continuous improvement activities).

## THE FIFTH S: SHITSUKE

The fifth S, Shitsuke (躰), is different from the first four Ss that Shingo and Ohno discussed in Toyota (4S). According to Japanese colleagues, Shitsuke is a rather strange word to use in a professional business setting, because it is usually reserved for raising children or pets. Shitsuke can be translated to “discipline”, “educated” or “following the rules”. Shitsuke implies a set of rules that somebody is taught. For 5S, the set of rule is 4S. The kanji character (躰) can be split into two parts: 身 and 美. 身 means body and 美 means beauty. In this

sense, Shitsuke is the process of training the (mental) body to become beautiful – which refers to developing a healthy and disciplined organisational culture.

The usual English translation of Shitsuke, “sustain”, can be misleading: Shitsuke is not about sustaining the first four Ss per se (remember that Seiketsu is the process of sustaining Seiri, Seiton and Seiso), but rather a fundamental culture-building process that makes sure people see the purpose of and are motivated to act on the rules of 4S. It fosters self-motivated discipline in the members of the organisation. Shitsuke should manifest itself in deeds and habits, such as, for example, washing hands, using safety equipment and proper working clothes, respecting the work time, prioritising the team over self, following standard operating procedures, and contributing with creativity to improve the standard. Only recently we have started to understand the power of Shitsuke in the lean production literature (see, for example, the books *The Toyota Way to Lean leadership* by Jeffrey Liker and Gary Convis, and *Toyota Kata* by Mike Rother).

## HOW TO DO IT

Admittedly, Shitsuke appears paternalistic—but the intention is good. In the Japanese system, the operator is taught by the foreman, the foreman by the line manager, the line manager by the production manager and so on. The relationship between a subordinate (Kohai) and a senior (Senpai, or sometimes “Sensei”, which means teacher is not “do what I tell you” or “tell me what to do and I’ll do it”, but rather a coaching relationship aiming to provide guidance from someone with experience to someone without. In particular, the role of the foreman is essential for the success of 5S. It is the job of the foreman to provide regular on-the-job-training for his/her operators. The shop-floor operators should implement and sustain 4S through Shitsuke.

Just as for the other Ss, there are practical methods that can assist the Shitsuke process too. On-the-job and class room training are obvious activities. Others include information billboards and slogans, daily team meetings on the shop-floor,

regular newsletters, town hall meetings, “gemba” walks by senior management, showing performance indicators on team boards, offer rewards and recognition, and perform checklists of adherence to standards. But none of this will be successful if the management style is that of “command and conquer”.

Managers need to lead by example to develop the right culture. There is no quick fix in creating discipline towards a 5S culture. On a day-to-day basis, managers must be visible, enthusiastic, and supportive. Teams should be empowered with budgets and time set aside for 5S activities. Everyone in the organization should be trained and developed. An effective way to do this is the “train the trainer” system, where the responsibility of 5S gets disseminated in the organization. Building a good 5S culture takes years.

## CONCLUSION

5S is extremely popular in industry. It is often celebrated as the first “tool” to implement in a lean journey. Unfortunately, countless firms never make it beyond the first Ss, and then they regress to no S. As this discussion of 5S shows, 5S is not a tool, but rather a full concept that builds a foundation for any professional business. Introducing the two first Ss, Seiri-Seiton, result in an orderly, effective and logical workplace. Adding the third S, Seiso, makes the workplace clean, functional and attractive. These three Ss are good housekeeping practices and create “visual control”, which is a wanted result of any 5S project. The fourth S, Seiketsu, is about sustaining the result. And the fifth S, Shitsuke, is about building discipline in the organisation towards the idea and standards of 5S.

Let’s face it, remembering five Japanese words (even remembering five sequenced words of your native language) is a challenging task. It is much better to understand the underlying idea of the concept. Not forcing a translation of 5S into words starting with S, I find the following suggestion to be more correct (see Imai, 1986, and Hirano, 1996, for similar translations):

- Seiri – Sort items to retain, return and rid

- Seiton – Organise items in the workplace
- Seiso – Clean the workplace
- Seiketsu – Maintain Seiri, Seiton and Seiso
- Shitsuke – Discipline the organisation

Individual perceptions of 5S differ widely. Very often it is wrongly perceived as a mere tool for tidying up and cleaning. These are indeed essential elements of Seiton and Seiso, but do not capture Ohno’s and Shingo’s original idea of 5S. We can hardly blame anyone for this limited understanding of 5S. First, there are different translations of the concept—some more correct than others. Even best-selling books on lean production get 5S wrong, most often misinterpreting Seiketsu and Shitsuke. Second, 5S is not a very intuitive concept; Seiketsu is integral for Seiri, Seiton and Seiso, and Shitsuke is integral to Seiketsu and a higher-level characteristic of the organisational culture. Third, because companies usually do not understand Shitsuke, the other Ss can never be sustained. This leads to cyclical restarts of incomplete 5S projects. Fourth, 5S itself has a direct cost, but doesn’t save a penny; the benefits are plentiful,

but indirect and hard to measure. Fifth, 5S is not sexy; it makes people start daydreaming of the weekend. We all know that a certain level of industrial housekeeping is needed, but can we ever succeed with 5S?

Here is my conclusion:

Try not to make 5S a goal in itself. It could probably be a good idea to never introduce (or re-introduce) 5S as a “tool” for your company. Focus instead on the leadership part, building the right discipline and culture in your organisation towards the objective of 5S:

*Create, maintain, and improve an efficient workplace organisation with high levels of visual control.*

Good luck with getting 5S right!

整理

Seiri

整頓

Seiton

清掃

Seiso

清潔

Seiketsu

躰

Shitsuke

## RECOMMENDED READING:

If you want to study the concept of 5S further, I recommend you the following books:

Imai, M. (1986). *Kaizen, the key to Japan’s competitive success*. Random House Business Division.

Ohno, T. (1988). *Workplace management*. Productivity Press.

Osada, T. (1991). *The 5S’s: five keys to a total quality environment*. Asian Productivity Organization.

Hirano, H., & Talbot, B. (1995). *5 Pillars of the Visual Workplace*. Taylor & Francis.

Hirano, H. (1996). *5S for Operators: 5 Pillars of the Visual Workplace*. Productivity Press.

Kimura, K. (2014). *Untitled manuscript about 5S*. Unpublished manuscript.

To learn more about Shitsuke (the fifth S) see the following books:

Liker, J., & Convis, G. L. (2011). *The Toyota Way to lean leadership*. McGraw-Hill.

Rother, M. (2010). *Toyota kata: managing people for continuous improvement and superior results*. New York: McGraw-Hill Professional.