

## Introduction

Ever take a good look around your office, especially after some hectic period of work? If it gets like mine, it can look like a cyclone hit it. Drafts of materials stacked on each other. Edited copy on the floor around my desk. Project reference materials stacked up on my spare table, along with journal articles I put off reading because I didn't have time to read them when they came in. The focus for most of us is on getting the work in-hand done and that can mean we let good organization go. Unfortunately, this can become a habit and, when the work space is shared, it can become a significant hindrance to working efficiently and, sometimes, safely.

One contribution of the Lean approach to business improvement has been a set of tools that anyone can leverage to improve workplaces and work processes. One of these tools, 6S (originally labeled 5S; see Exhibit 1), addresses just the situation I described. Most people may think of it as relating to manufacturing workplaces, but it is just as applicable to office settings. As with all Lean tools, 6S is about eliminating waste and maximizing value-added work. To this end, 6S uses its process to create and maintain an organized, clean, safe, and efficient setting that enables the highest level of value-added performance. This means eliminating search, travel, transporting materials, inventory, and hazards. It achieves its ends by introducing organization and orderliness, eliminating unneeded materials, and establishing self-discipline. In a sense, it transfers some principles of "time management" from the "virtual space of your work schedule" to the physical space of your office or shop area.

### Exhibit 1. The Origins of 6S

What we call "6S" derives from "5S" the method of workplace organization and visual controls developed by Hiroyuki Hirano (*5 Pillars of the Visual Workplace*, Portland, OR: Productivity Press, 1990). The five "Ss" refer to five Japanese words—*seiri*, *seiton*, *seiso*, *seiketsu*, and *shitsuke*. *Seiri* means to separate needed and unneeded materials and to remove the latter. *Seiton* means to neatly arrange and identify needed materials for ease of use. *Seiso* means to conduct a cleanup campaign. *Seiketsu* means to do *seiri*, *seiton*, and *seiso* at frequent intervals and to standardize your 5S procedures. *Shitsuke* means to form the habit of always following the first four Ss.

The origin of 5S seems rooted in the works of two American pioneers who were scrupulously studied by Japanese managers. These were Frederick W. Taylor's *Scientific Management* (1911) and Henry Ford (1922). Indeed, Ford's CANDO program (Cleaning up, Arranging, Neatness, Discipline, Ongoing Improvement), which builds on Taylor's work, appears as the obvious origin for 5S.

Here are our labels for the 6Ss and their meaning.

- **Sort** - Distinguish between what is needed and not needed and remove the latter.
- **Stabilize** - Enforce a place for everything and everything in its place.
- **Shine** - Clean up the workplace and look for ways to keep it clean.
- **Standardize** - Maintain and monitor adherence to the first three Ss.
- **Sustain** - Follow the rules to keep the workplace 6S-right—"maintain the gain."

## An Introduction to 6S - Don Roll

- **Safety** - Eliminate hazards. (We added this sixth "S" so we could maintain the focus on Safety within our Lean events and embed safe conditions into all our improvements.)

There are a number of great reasons for using 6S. It is a natural for building teams who share a common work area. For one thing, every team member benefits from it and for another, it fits common sense. Everyone has had the experience of losing work, misplacing documents and spending frustrating and wasteful time looking for them, tripping on objects left in the working place, etc. As a consequence, 6S is a tool whose value is readily grasped. Everyone can get their arms around the concept of "a place for everything and everything is in its place." Another great quality of 6S is that it is doubly enabling. It enables people to be free of aggravations that hinder their work and it is a wonderful way to involve people in improving their own work settings. That enables greater employee empowerment. Finally, the visual impact of a 6S event makes the improvement it produces impossible to miss and this creates a real sense of achievement and pride that can form the beginning of a more significant cultural transition (see Exhibit 2, next page).

### Caution

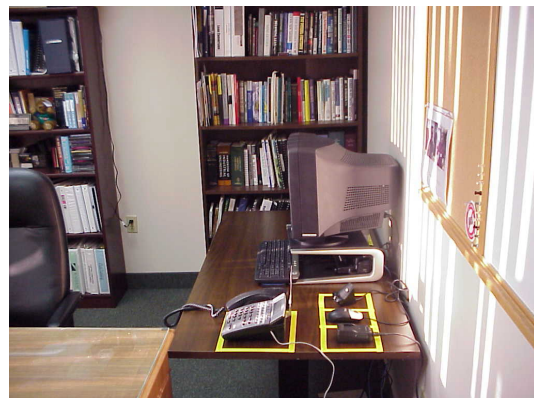
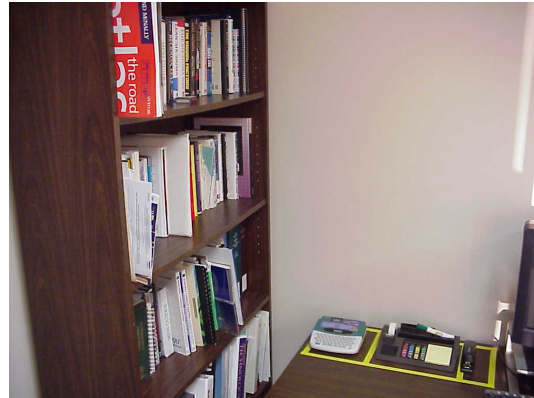
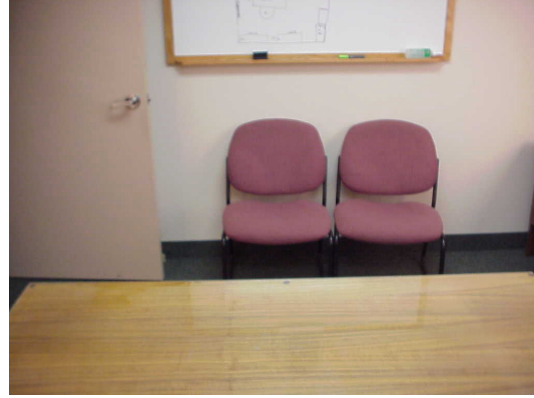
Do not be misled by the before and after photos that everyone doing 6S produces. They are valuable portrayals of measurable improvements, but they rivet attention to the workplace and, in that sense, they can mislead. 6S may appear to focus on a *workplace*—sorting, straightening, etc. the area in which people work, but this is not correct. The root focus of 6S is the *work process* that is executed in the workplace. The reason is this. All Lean is about producing products that are fully value adding to a customer. Only processes that are themselves absolutely value adding (meaning 100% *devoid* of waste) can produce such products. While detecting disorganization in a workplace may be obvious, it is not obvious what, in a concrete sense, good organization is. Should tool X go by work station A or B? Where should we place the copier in this office to reduce travel and transport? In the center of the workplace? You can't answer these questions in a way that eliminates waste unless you understand the work process that people implement in that space and the job each person does. Also, what information should be posted and where? Again, you can't answer either of these questions if you do not understand the work process people are implementing. So, the root focus for 6S is the work process, not the workplace. In office workplaces, where it is common for one area to service many work processes, this is especially critical. It is quite possible to optimize a workplace for one work process while making it even more problematic for others using the same space. So an important initial step to applying 6S is to identify the work process you are to benefit and every other work process using the space you will 6S. Your solutions must serve them all.

Exhibits 2. 6S's Impact Is Easy to Understand<sup>1</sup>

Before

After

Office Example



<sup>1</sup> Thanks to Frank Butz and Tony Manorek for the use of these photos. Keep up the good work guys!

You should also recognize a related point. 6S will need to be recycled, if your company is truly committed to continuous improvement using, for example, Kaizen. That is because you will modify the work process over time, meaning that your 6S solutions will also require adjustment.

### Using 6S

We use a three phase approach to doing 6S. We get ready for the event, do it, and then follow-up to make sure our improvements sustain. We adopted steps and materials from the Kaizen method documented in the *Kaizen Desk Reference Standard*, with the written permission of the copyright owner (Vital Enterprises).

#### Getting Ready

To get ready for the event, we meet with the manager of the work area to identify what he or she wants the event to achieve. You need to know the manager's idea of how the work process in the target work area needs to improve and what business benefits that improvement should produce. With this information, we describe a scope for the proposed event. I do not draft a formal strawperson mission and goals, but I do form an idea of what these should be. One change I am considering is adopting the practice of documenting the strawperson mission, goals, and "do's and don'ts" as is recommended in the *Kaizen Desk Reference Standard*. I can use the electronic form in the Kaizen Tool Kit, and this should make confirming the manager's expectations for the event easier to do and provide a surer result. Up until now, however, I have not done this.

#### Exhibit 3. Getting Ready Steps

1. Get the customer's expectations.
2. Build a scope document.
3. Define a strawperson mission, goals, and "do's and don'ts" for the event.
4. Assess whether doing the event makes sense.
5. Get the people and the setting ready for the event.

Once I confirm the manager's expectations, we identify the people who will be on the 6S team and talk with them to assess what they understand about 6S, add to that understanding, and get their judgments about how effectively the workplace currently supports getting their jobs done. The team is made up of people working in the setting that we will 6S. Sometimes, that's everyone. Other times, the setting is large or there may be shift workers. If I can get to visit the work site, I do. There is no substitute for direct observation and meeting people face-to-face. If not, I use the information from the manager and from my conversations with workers to evaluate whether doing the event makes sense. I need to be sure I can use 6S to accomplish the purposes the manager has expressed and provide the improvements that employees feel will be meaningful. I also need to make sure that there is a good business case for the event. Events take time. Large events will take as much as five days. I need to see the possibility that 6S will take out enough waste (travel, transport, excess materials, etc.) to justify its cost. Once I make the judgment, I share it with the manager and the workers and start the preparation for the event.

First, I want to communicate to the proposed team what our schedule will be and provide them some pre-event materials to read (e.g., the scope of the event). I also enlist them in getting ideas from their fellow workers about what workplace improvements would make getting the work done more efficient. I also let them know that we will post a pre-event flyer in the workplace announcing the event, naming the team members, and directing workers to them for more information and for sharing their ideas. My last preparation step is to make sure the logistics for the event are in place. Depending on the type of work area—shop or office—we have a variety of materials we need for the team to do their job (e.g., clear tape, clipboards, colored tape, digital camera, double-sided tape, graph paper, wheels for measuring travel distances, safety equipment). We also need easels and flip chart paper and wall space for recording the team's findings and ideas and for displaying its mission, goals, and results.

### Doing the Event

I open the meeting by welcoming everyone, re-introducing myself, and saying what our mission is for the 6S event. I make sure everyone knows each other or we make introductions. Next I like to use an ice-breaker activity to begin building the team. A good one is having the people share what they like and don't like about their work area. I remind them to include both their own ideas and those that other workers in the area shared with them. We summarize the workers' thinking, list their concerns and ideas on flip chart paper, post them, and refer back to them during the meeting. We use these ideas as part of the information to analyze in detecting waste due to workplace disorganization and the lack of visual information.

#### Exhibit 4. Doing Steps

1. Open the event.
2. Prepare the team.
3. Get the facts.
4. Assess waste.
5. Generate improvement ideas.
6. Select the best ideas.
7. Make improvements.
8. Measure results.

#### Prepare the Team

Next, I do a brief introduction to 6S, explaining what it is, how it is done, and showing some "before" and "after" pictures of other work areas where we have done 6S. We make sure to use pictures that mirror the setting of the workers with whom we are speaking; otherwise, they will not have as much value. We also make sure to relate the purpose and benefits of 6S to the issues the team has raised about its own work area.

This leads naturally to a review of the scope for the event. I support the team in analyzing the scope and any other materials so we can form a strawperson mission and goals. From the scope document itself, we draw the "do's and don'ts" for the event. The mission, goals, and "do's and don'ts" are tentative because we have not done a walk through to directly observe where the workplace is at with respect to 6S standards. With our tentative direction set, I review the day's agenda. Finally, the team members build a set of ground rules for how they will work together and we review

the *Working With Others* skills<sup>1</sup>, which are essential to sharing and building on each other's ideas. Then, we get to work.

### Get the Facts

The team's first job is data collection. We have several tasks to complete—do a workplace layout, take "before" pictures of the workplace, make observations of waste in the workplace, complete a 6S evaluation of the workplace, and interview workers in the area. We assign one team member to do the workplace layout and another to do the pictures using the digital camera we bring to the event. For both these roles, we use the guides supplied in the Kaizen Tool Kit that accompanies the *Kaizen Desk Reference Standard*. You can find them in the book as well (*Kaizen Desk Reference Standard*, pages 294 and 303-304).

We teach the team members about waste associated with workplace organization and give them an exercise that confirms their ability to detect waste (see Exhibit 5 for an explanation of the role waste detection plays in 6S).

#### Exhibit 5. Why Introduce the Concept of Waste?

Some people may say, "It's just obvious how messy or not a place is. Why make things more complicated by bringing in this notion of waste?" That's a good question because it is true that disorganization is obvious. Why do more than is necessary to fix it? Well, most businesses look at the bottom line benefits they will receive when evaluating what they will invest in.

While disorganization is obvious, what is not so obvious is how it measurably affects businesses performance. Here is where detecting and measuring waste helps. Waste is the link between disorganization and operating measures. Travel and transport, for example, eat up time. Time costs money in many ways (labor cost, longer cycle time). Observe that waste, measure it, and you can estimate the cost of that waste *and the price the company pays for disorganization*.

An even more fundamental reason for including the detection of waste in a 6S event is that eliminating all waste is one of the pillars of Lean. Although it may be impossible to imagine, if a disorganized workplace produced no waste in the process of satisfying customers requirements, then its disorganization would be irrelevant from a Lean perspective.

(For more discussion of the relationship between waste, operating performance, and final business results see pages 244-247 and 255-256 of the *Kaizen Desk Reference Standard*.)

Next, we introduce the team to the 6S Evaluation form (Exhibit 6). Every team member is given a copy of the scale and asked to evaluate the workplace after we complete a walk through. We then prepare the team to do the walk through during which team members make observations and speak with workers to get their ideas. The team does the interviews using a modified version of the interview guides in the *Kaizen Desk Reference Standard* (pages 233–236) (again, with the written permission of the copyright holder).

<sup>1</sup>J.S. Byron and P.A. Bierley (2003). *Working With Others*. Hope, ME: Lowrey Press.

Exhibit 6. 6S Evaluation Form

| 6S Area: [Name the work area]       |   | Item Score   |       |  |
|-------------------------------------|---|--|-------|--|
|                                     |   | Before   | After |  |
| <b>Sort</b><br>(Organization)       | <b>Distinguish between what is needed &amp; not needed</b>              |  |       |  |
|                                     | Have all unnecessary items been removed?                                |  |       |  |
|                                     | Are walkways, work areas, locations clearly identified?                 |  |       |  |
|                                     | Does a procedure exist for removing unneeded items?                     |  |       |  |
| <b>Stabilize</b><br>(Orderliness)   | <b>A place for everything and everything in its place</b>               |  |       |  |
|                                     | Is there a place for everything?  |  |       |  |
|                                     | Is everything in its place?   |  |       |  |
|                                     | Are locations obvious and easy to identify?                             |  |       |  |
| <b>Shine</b><br>(Cleanliness)       | <b>Cleaning and looking for ways to keep it clean</b>                   |  |       |  |
|                                     | Are work areas, equipment, tools, desks clean and free of debris, etc.? |  |       |  |
|                                     | Are cleaning materials available and accessible?                        |  |       |  |
|                                     | Are all aisle markings, location indicators, etc., clean & unbroken?    |  |       |  |
|                                     | Cleaning schedules exist and are posted?                                |  |       |  |
| <b>Standardize</b><br>(Adherence)   | <b>Maintain &amp; Monitor for adherence</b>                             |  |       |  |
|                                     | Is all necessary information visible?                                   |  |       |  |
|                                     | Are all standards known and visible?                                    |  |       |  |
|                                     | Are all visual displays current and up to date?                         |  |       |  |
|                                     | Is there adherence to existing standards?                               |  |       |  |
| <b>Sustain</b><br>(Self-Discipline) | <b>Following the rules to sustain</b>                                   |  |       |  |
|                                     | Are procedures being followed?  |  |       |  |
|                                     | Does an on-going audit and feedback system exist?                       |  |       |  |
|                                     | Does a system exist to respond to audit feedback?                       |  |       |  |
| <b>Safety</b><br>(Zero incidents)   | <b>Maintaining a safe work place</b>                                    |  |       |  |
|                                     | Is a green tag system in place?   |  |       |  |
|                                     | Are appropriate controls in place to identify safety equipment?         |  |       |  |
|                                     | Is all safety equipment unobstructed and accessible?                    |  |       |  |
|                                     |   | Total Score  |       |  |
| <b>Evaluators Name:</b>             |   | <b>Scoring:</b><br>0= No problems<br>1= One to Two problems<br>2= More than Two problems |       |  |

### **Assess Waste**

After the walk through, we pool the observations of waste that derive from how the workplace is organized and document them in the same form we use in doing Kaizen events (*Kaizen Desk Reference Standard*, pages 237–238). The Kaizen Tool Kit provides an electronic version of this form into which we type our observations. Before we move on, the team members complete a 6S Evaluation form for the workplace. Each person fills out his or her own form. Then, I build one for the whole team, getting each member's judgments and averaging the ratings across team members. If there are differences in ratings, we discuss the differences. We always rely on the documented observations to make our final judgment.

We next summarize our findings and use these to test whether the mission and goals for the event are valid, given the facts in the workplace. We adjust either as needed. Before we consider how to eliminate the waste we observed by applying 6S methods, we make measurements of the waste we observed. For example, we may measure the distanced traveled by workers during the work process or the time spent in searching for tools or materials or we may estimate the amount of scrap in a workplace or the amount of paper wasted in an office operation. These measures allow us to calibrate which type of waste most affect the operational performance of the work process we want to improve. Again, we find that the guides provided in the *Kaizen Desk Reference Standard* (and in its Tool Kit) are useful for our measurement purposes (see Task D2. Evaluate the Target Work Process, pages 267-309).

### **Make Improvements and Measure Results**

Now we get to the best part of the event. The team takes each goal, looks at the observations associated with it, and generates ideas to eliminate the waste and improve workplace organization and the display of important information. These actions fall within one of the 6S's. For example, the team may propose removing unnecessary items in the work area (*Sort*); arrange necessary items in an orderly manner that places them nearest to their points of use (*Stabilize*); re-paint signs that are faded, walls where paint has failed, replace broken chairs (*Shine and Safety*); and write job aids to remind workers of tasks to do to keep the workplace enabling of their work (*Sustain*). (See Exhibit 7, next page, for other examples of 6S improvements.)

Once we select the actions to implement, we verify that the actions we have selected will actually accomplish the event's goals. All improvements have value, but the priority is given to those that will accomplish the purposes for which the event was scheduled.

We build an action plan to guide doing an action when it is complex or needs coordinated action by several team members (see Action Plan Template in the Kaizen Tool Kit, version 1.3). The team members make the changes and then we recycle the measurements and other data gathering tasks they completed before we made changes. We always do after pictures and a 6S Evaluation. If we have attempted to reduce travel and transport, we will redo measurements of distance traveled during



the performance of the work process. Similarly, the team members will do other measurements needed to judge whether the goals of the events are accomplished.

| Exhibit 7. Other Examples of Improvement Actions  |   |   |
|---|---|---|
| Shop  | Office  |   |
|   | Physical  | Virtual <sup>1</sup>  |
| <ul style="list-style-type: none"> <li>■ Implement red tag system<sup>2</sup></li> <li>■ Implement a green tag system<sup>3</sup></li> <li>■ Implement color codes<sup>4</sup> and standards</li> <li>■ Introduce simple materials Kanban<sup>5</sup></li> <li>■ Create visual work instructions</li> <li>■ Improve workplace layout/reclaim wasted space</li> <li>■ Create and implement sustaining system with audits</li> <li>■ Implement relevant visual metrics</li> </ul> | <ul style="list-style-type: none"> <li>■ Implement red tag system</li> <li>■ Implement a green tag system</li> <li>■ Improve workplace layout</li> <li>■ Introduce point of use<sup>6</sup> concepts</li> <li>■ Eliminate ergonomic hazards</li> <li>■ Enhance visual communication methods</li> <li>■ Alternative storage scenarios</li> </ul> | <ul style="list-style-type: none"> <li>■ Virtual red tag system</li> <li>■ Improve file/folder hierarchy</li> <li>■ Improve disk storage space and speed of retrieval of electronic files</li> <li>■ Create standards for file management and creation</li> <li>■ Improve or create job aids to eliminate search and defects</li> </ul> |

<sup>1</sup>Virtual refers to electronic information and the media on which information is stored—computer disk drives, back-up media, etc.

<sup>2</sup>Red Tag System - A method for identifying information and things in the work area that are not needed for performing day-to-day the work. Each red-tagged item is dated and moved to a central holding area. If the item is not used after a certain period of time (maybe between 1 to 6 months), it is then disposed of. A red tag system is an excellent way to free up valuable floor space and eliminate such things as broken tools, obsolete jigs and fixtures, scrap and excess raw material in shop settings and unneeded documents, file cabinets, old correspondence, and office supplies or equipment in office and service settings. Virtual red tagging create a space on a disk drive as the holding area for electronic files and folders, but otherwise operates in the same manner.

<sup>3</sup>Green Tag System - A method for ensuring a safe workplace. It identifies, corrects, or removes unsafe equipment or prescribes cautions for the use of equipment that is safe to use only when specified cautions are followed. The system prescribes that each piece of equipment is inspected for compliance with safety standards with regard to its construction and current condition. The system uses Green, Yellow, and Red tags. A Green tag means the equipment passed inspection and is safe for use. The Yellow tag means that the equipment is safe to use if certain requirements are followed. The Red tag means the equipment is unsafe to use and should be removed from the workplace either for discard or repair.

<sup>4</sup>Applies selected colors to identify specific functions or meanings in a workplace. The assignment of colors to functions is standardized across an organization. For example, we may assign the color yellow to indicate a Kanban area or some other function like parking area for transient equipment or storage area for materials or tools. In a shop setting, we might use the color white on the floor to identify personnel walkways.

<sup>5</sup>Signal cards (or other visual signaling) used to pull product (product Kanbans) through a production system or materials from inventory (materials Kanban). Makes visual the demand for either product or materials. In a Kanban using cards, when a component is used a card is passed upstream and only then will upstream operations receive the authority to begin production of a replacement component or replenishment of needed materials. from inventory (materials Kanban).

<sup>6</sup>Places information visually where it is vital to adding value to the product or service being produced.

## Following Up

The team closes out the event by doing a presentation of what it accomplished and what it will do to sustain the improvements it made. This presentation is made to all the workers in the area and other interested groups, including of course the manager who requested the event. We build the presentation using the event's mission, goals, and "do's and don'ts." This anchors us in what we were to achieve. We use our before facts (pictures, 6S Evaluation, measurements, and observations of waste) to describe the

problems that existed. Then we share the team's action list, tell about what happened as we made improvements, and end with the post-event facts (pictures, 6S Evaluation, measurements, and observations of waste). It works out easily because we have all the information developed and organized by the time we get to the end of the event.

### A Few Tips

Be sure to credit the workers in the work area who were not able to be on the team itself. The event would not have produced its results if they had not contributed their information and ideas. Especially credit any improvement ideas that came from them and identify clearly who provided the ideas. Everyone needs to be recognized for the help they provided. There is the "6s team"—and you want to make sure you credit its work—but, there is the larger team of which it is a part. Also, don't leave out the manager who initiated the event. Without his or her initiative, the event and its good results would never have been achieved. Finally, emphasize the importance of sustaining the event's gains. Consider using a leave-behind measure that visually displays the improvements that were made and records the day to day sustaining of both the improvement actions and the benefits they produced. Check out the discussion and examples of leave-behind measures in the *Kaizen Desk Reference Standard* (pages 173-174, 341-342, 349, 385).

### The Pay Off

While Workplace Organization and Visual Controls (WOVC) events are usually very hard work, most participants express great pleasure in having participated. The physical change is truly significant, they have been allowed to positively impact their own workplace with their own ideas, and the area is more pleasant to work in after their efforts. Many times this participation has served as a springboard for additional efforts not only for the individual, but for the organization as well. Setting the stage with pure WOVC events is great for paving the way for other continuous improvement activities an organization may be contemplating.

### Postscript: The Virtual Office<sup>2</sup>

Especially in the office environments, we live in two worlds—one physical (rooms, desks or work stations, papers, equipment) and the other virtual (electronic files, folders, forms). To be effective, 6S needs to go to the virtual workplace as well as the physical workplace. Here, we have lots of history and prior practice to draw on that actually predates Lean. For example, former President Jimmy Carter promoted and signed into law the Paperwork Reduction Act in 1980. The law authorized the Bureau of the Budget (now the Office of Management and Budget) to coordinate Federal reporting services, eliminate duplication and reduce the cost of such services, and minimize the burdens of furnishing information to Federal agencies. One by-product of this effort was the development of an information policy and an information management function. This function was responsible for systematically analyzing an organization's information requirements,

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<sup>2</sup>Thanks to Dr. Raphael L. Vitalo for the information in this section. He has worked in both information resource management and database design for enterprise information systems.

identifying what information was needed and what was unneeded, establishing standards for each needed information item, and using this knowledge to eliminate stored information and the paper forms or electronic input screens that collected it.

As electronic information systems proliferated, a similar problem emerged. In large organizations, separate automation products using non-standardized development practices built multiple applications and databases that held the same information but stored it in inconsistent formats and using different data definitions. This redundant and non-standard information spells waste on many levels—storage space, processing overhead, duplicative database maintenance overhead, and lost opportunity to leverage corporate information assets are just a few examples. One movement that emerged was to develop a corporatewide information architecture wherein each element of needed information is defined in a single way with respect to its meaning and its data characteristics (data type, format, size, acceptable values, sourcing, etc.). This straightening and sorting of virtual space was concretized in a data dictionary that served the enterprise. Alas, none of these developments have sustained with rigor, as you might rapidly discover if you investigate both the variety of non-interfacing databases in you own company that store the same information (customers, products, orders, financial information, etc.). However, the tools these disciplines used are available for our learning and use within a 6S context and their importance and utility only grows.

Safety, as applied to working in virtual space, has two other relevancies. One relates to ergonomics and the other to the security of the information one creates and stores and to communications one executes electronically. As to ergonomics, there are features of computer systems such electronic emissions and the characteristics of monitors (e.g., blue light exposure) that can have harmful effects. They represent hazards. As to security, safety addresses issues of protecting access to one's system and data, ensuring the security of on-line communications, and protecting against viruses and exploits intended to compromise your system.

Thus, the opportunities for applying 6S to the virtual office are wide open!

### References

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