

TECHNICALLY speaking

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Increasing Competitiveness via Continuous Improvement

In today's economy, everyone is searching for ways to sustain or increase profitability without expensive investment in capital equipment or other apparent fixes. And yet, the answer is there, right before your eyes. You may not have the right prescription for your "glasses," but I hope you will after considering the concepts presented herein.

The good news is, your glasses won't cost anything but time. Regardless of your rank in the organization, your education, your years of industry experience, etc., you can make big leaps in operational excellence by finding and improving the "small" things.

You might be expecting me to talk about *muda*, or waste, but this topic has been covered repeatedly. Unfortunately, there is more important territory to cover: the concepts of *muri* (overburden) and *mura* (unevenness). These will help to hone your glasses' prescription in a humane and efficient way.

I learned the importance of these terms during a 20-year career at Toyota; researching, training, and implementing the Toyota Production System (TPS). At one point I held the position of manufacturing manager. We frequently had visitors from Japan who would come through the area and make suggestions for improvement. As I showed some examples we had implemented on the floor to reduce *muri* and *mura*, the Japanese visitors laughed. I asked what was funny to them. A very knowledgeable TPS advisor said that he thought the concepts of *muri*

and *mura* were dead. So, I was happy to learn it was grateful laughter. Let me introduce these to you in more detail:

Muri: Any type of overburden for employees, either mental or physical.

It also applies to machines that are being asked to do more than they are normally capable of doing.

Let's start with *muri* first because that is how we go about making improvements. Can you imagine why this comes first? Look again at the aforementioned definition. If we can lessen the burden on employees, they will be motivated to help with your overall improvement efforts. What questions do you have about this concept? Take a minute to jot some down (without reading ahead). Seriously. I think I can predict some of them:

Question 1: Which employees? Floor workers? Administrative staff?

Answer: Everybody in the entire company and your supply chain.

Question 2: How can I tell what overburden is? (What appears difficult for one person looks easy for others.)

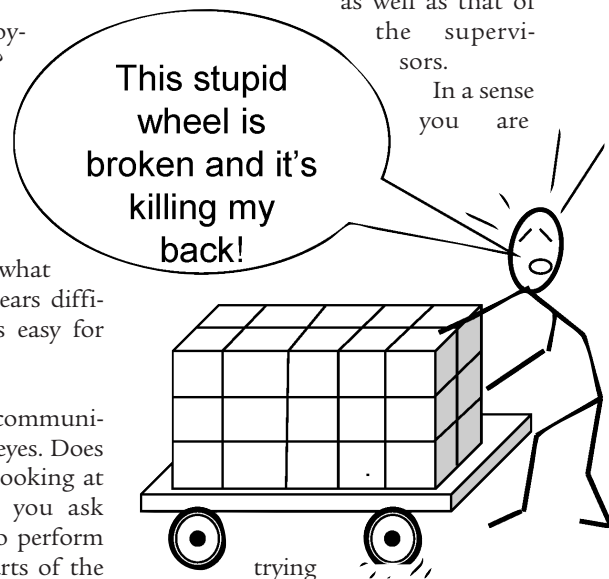
Answer: Observation and communication. Develop your own eyes. Does the job (process) you are looking at seem reasonable? Would you ask members of your family to perform that job? If not, which parts of the

process do you think would be difficult for them? Do you have any standards for the process—weight, time to complete, lighting, noise, etc.? Ask the people doing the job what aspects of it are physically taxing? Do they have any ideas about what could be done to make the job easier? Talk with the supervisors—ask them the same questions.

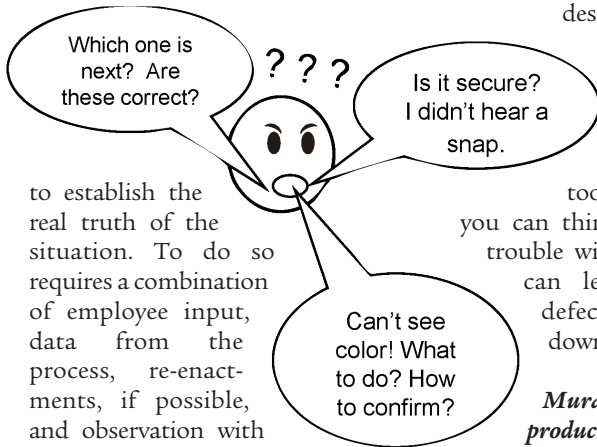
Question 3: What do you mean by mental overburden? (I don't know anyone who isn't stressed out.)

Answer: Mental overburden means: overloading the job with decisions under time pressure, leaving the employee on their own when abnormal things happen that they are not quite sure how to handle; putting them in a position to have to guess if the work is OK or not, scraping or reworking their products without any feedback about what is wrong; and providing conflicting information or none at all. Again, get their input as well as that of the supervisors.

In a sense you are



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to establish the real truth of the situation. To do so requires a combination of employee input, data from the process, re-enactments, if possible, and observation with an open mind. It is very similar to what scientists do to prove a hypothesis or how detectives go about solving crimes. The common element of these examples is that you have to be curious and methodical about how things work in your organization, both when things are normal and when abnormalities occur.

Note: Sometimes extra effort is required to recognize abnormalities because the abnormal has become normal to the people working in the area.

Question 4: How can a machine suffer from overburden?

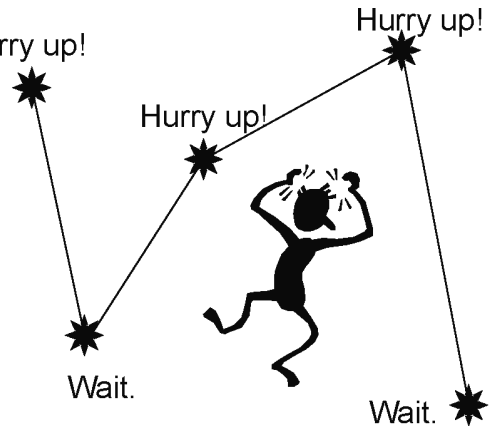
Answer: Machines become overbur-

dened when we exceed the original parameters or specifications set by the machine designers. Examples would include running them too much, too fast, or with material that is too heavy. I am sure you can think of more. The trouble with this is that it can lead to injuries, defects, and breakdowns.

Mura: Unevenness in your production system, which leads to muri for the employees.

Unevenness happens when volumes move up and down temporarily. This is created by changes in the production schedule, previous processes “pushing” material at the next process, or perhaps empty containers stacking up at processes. This often comes when there are major machine breakdowns, quality problems, and large production lots (resulting in work in process being haphazardly scattered around the work site). Of course, customer orders are also a culprit, but you need to challenge to reduce muri that is within your own control first. Then, you can show customers your improvements and how

Hurry up!



Wait.

Wait.

much bigger they could be if you work together.

HOW TO GET STARTED

There isn't one right way to get started. A suggestion would be to set aside at least an hour and place yourself in a good position to watch one process. Of course, you will want to select one where it is relatively easy to observe without interrupting or intimidating the employee. Also, you should take a moment to explain to the employee what you are doing: looking for muri, or overburden, to him/her. Tell them you would also like to get their input for a few minutes during a break, lunch, or even after the shift.

As you watch the process, look for clues to muri (you need these because

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employees adapt to confusion and extra effort so that sometimes muri looks smooth for them). Some clues to look for on the physical side are: arm muscles tightening, hands gripping tightly, hands or other parts of the body used as tools (examples: hold the part against the stomach while working with it, using the body, especially hands, to strike the part).

For mental muri, it is relatively easy to find by watching the employees' eyes. The eyes are generally a mirror of what a person is thinking. If their eyes keep darting back to a machine they have already loaded and started, it means they don't trust the machine for some reason. Try to find out the reason. Also, watch for facial expressions. Are they frowning? Do they squint to see something? These are all signs of muri.

Next, you have to do something with your list. You probably will want to prioritize it by getting quick input from employees on the process and support personnel. Then you must *do* things to eliminate muri. Please don't take time to have things fabricated in the maintenance area. Many trials will be required, and you can do just about anything with three

simple tools: cardboard, tape, and string. Mock it up and put it in place, with the employees participating. Whatever you do, don't forget to follow-up to see if it is working or not. Did the other shift remove the trial improvement? That means you forgot to communicate with them. It is hard to recover from this because the shifts other than first often think they are not as well respected as the other shifts. No communication with them on improvements to the process is just reinforcing that mindset.

Once you have some experience and success with muri, you can start to focus on mura. You can use the same observation technique. Understanding what is happening to cause the fluctuations of mura helps push you in the direction of what is wrong with the big-picture production system and, subsequently, what is causing this unevenness within the process.

I hope you have improved "vision" with this overview, but the truth is that things won't actually be much better until you gather the courage* to observe the work site and actually try some things to improve your competitiveness. If you are interested in learning more about these continuous improvement concepts, please visit the

Greater Boston Manufacturing Partnership website at www.gbmp.org

*This is required because you will be letting your employees know that you don't have all the answers and that you need them on your side to take the company to the next level of strength.

BIO

Lesla Nichols is the continuous improvement manager for the Greater Boston Manufacturing Partnership. Nichols joined GBMP after 20 years with Toyota North America. Some of her principal responsibilities at Toyota included successful creation of new and modified methods for effective implementation of the Toyota Production System (TPS) at North American Toyota plants and certain suppliers. This work included standardized work, problem solving, and short- and long-term Kaizen for work site leaders. In addition, she specialized in at-the-work site support and coaching, utilizing her experience gained as a production manager within Toyota's Georgetown, Ky., powertrain plant.

Prior to joining Toyota, Nichols served as a U.S. Senate staffer and has been a senior public relations advisor to political campaigns and major manufacturers. She holds both a B.A. and M.A., focusing on international business. Nichols can be reached via e-mail at lnichols86@yahoo.com.

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