iSIXSIGMA MAGAZINE

From the September/October 2009 Issue ▪ Volume 5, Number 5

SKILL BUILDER

The Seven Wastes

BY RON PEREIRA

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Be Lean by identifying non-value-added activities

BY RON PEREIRA

One thing is certain: Waste is all around – at work, at home and everywhere in between. As applied to business, waste, or *muda* in Japanese, is any activity that adds no real value to the product or service being created or delivered.

The diligent ferreting out and elimination of waste in how work is performed is a fundamental tenet of Lean, the operational excellence strategy that was developed over many years and is widely used in business today. (See "A Brief History of Lean.")

Lean battles seven commonly recognized wastes: transportation, inventory, motion, waiting, overproduction, overprocessing and defects. Following are explanations of these wastes, with examples in manufacturing and transactional environments.

Transportation

The waste of transportation occurs any time goods or materials are moved. To be fair, some form of transportation will always be needed, but the act of simply moving things around the plant or office adds no real value to the product or service.

In manufacturing, the most common form of transportation waste occurs when material is transported across the plant with forklifts. Additionally, conveyor systems are nothing more than elaborate and space consuming transportation waste creators.

In a transactional environment, transportation waste occurs when documents or folders are transported around the office by person or internal courier.

Inventory

The waste of inventory is tricky because for producers of any type of goods or services some inventory is needed. But inventory must be carefully controlled.

To illustrate the point, imagine this situation: Bob has spent his life savings on soap that he hopes to sell for a profit. While this soap may indeed appear as an "asset" to his financial controller, Bob's kids are getting hungry and until he actually sells some of this soap, they will have to be content with peanut butter and noodles.

Motion

Motion is probably the most misunderstood waste of all. Often confused with the waste of transportation, the waste of motion is any movement of people that does not add value to the product or service. It is an extremely high productivity killer.

Examples of motion waste: Whenever assembly operators are forced to walk away from their work area, or must reach and strain for a tool. Also, the 39 times a day office workers are forced to get up from their desk and walk 32 paces to the shared printer (1,248 paces).

Introducing Tim Woods

Remembering the seven (or eight) wastes is not an easy task. Ask experienced Lean practitioners to rattle them off and many will start strong and then struggle to come up with the last few.

Mnemonic devices are a good way to remember the wastes. Several word combinations have been created over the years to aid in jogging the memory.

Here's one that includes the sometimes-added eighth waste of skills. Simply think of Tiger Woods' long-lost cousin – Tim Woods.

- **T**ransportation
- **I**nventory
- **M**otion
- **W**aiting
- **O**verproduction
- **O**verprocessing
- **D**efects
- **S**kills

Waiting

Anytime people are queued up, the waste of waiting is happening. For example, Bob flew overseas to sell some of his soap, only to arrive at customs where the line wrapped so far back he couldn't even see the end.

Waiting is another productivity killer and is a major source of frustration for customers. It doesn't matter if the waiting occurs in the manufacturing area, the doctor's office or the airport. Waiting stinks, so it should be eliminated altogether.

Overproduction

Often called the mother of all wastes, overproduction occurs when a company produces more than its customer (internal or external) needs. This often happens in manufacturing when, in order to absorb long changeovers, an operator produces 100 widgets even though the customer ordered 25. Overproduction is also seen in non-manufacturing environments, such as restaurants throwing away excess food, which can definitely impact the bottom line.

The reason this is the mother of all wastes is simple: The waste of overproduction gives birth to other wastes. Excess goods created by overproduction need to be moved around and stored (transportation and inventory), which takes people away from their work (motion). Overproduction even creates waiting, as it often delays production of products that customers actually want.

Overprocessing

Perhaps the hardest waste to see and understand is overprocessing – doing more than a customer asks for.

For example, while a customer may indeed admire a lovely gold-plated finish to a product, they simply want, and

are only willing to pay for, a bronze finish. In this case, a company is throwing away time and money by overprocessing with gold plating. Likewise, if a simple website explaining what a company has to offer will serve the purpose and convert leads into an acceptable level of sales, there is no need to spend $8,000 on the creation of the most amazing site ever seen.

Defects

Last, but certainly not the least of the seven traditional wastes, is the waste of defects. Formally defined, a *defect* is any work that is less than the level the customer has requested.

In manufacturing terms, defects occur when the product has something wrong with it, such as when an electronic device won't turn on because of a short in the circuit board. An example of a defect in a transactional environment: A procurement specialist, when entering a purchase order, might type "1,000" when they actually meant to type "100."

The Eighth Waste – Skills

Sometimes in focusing on the elimination of the seven wastes, companies forget about the aspect of Lean that is inherent in the philosophy as it was originally developed in Japan – respect for people. In other words, the recognition that a company's most important assets are its employees. To that end, Lean practitioners sometimes add an eighth waste to the list – skills.

This waste occurs when a company does not fully leverage the gifts and talents of its associates. In fact, employees may even decide to leave a company for the simple reason that they do not feel as though they are being listened to or valued, and, as such, they feel like a number in a sea of numbers.

Standing in the Circle

After a practitioner knows the wastes by heart (see "Introducing Tim Woods" for a trick to remember them), the wastes will jump out everywhere. One of the best ways to spot them is to "stand in the circle," a practice advocated by Taiichi Ohno, one of the chief architects of the famed Toyota Production System, which is steeped in the philosophy of the elimination of all waste.

Standing in the circle involves a piece of chalk, a circle drawn on a concrete floor and an employee left to stand in the circle for hours. Ohno would often return to check on what the person had learned through observing work processes. Woe to the manager who answered "No problems here, sir!" as they were sure to spend more time in the circle until they identified some areas for improvement.

While the concept seems extremely simple – and it is – it is equally powerful. Practitioners may be amazed at how many opportunities to eliminate waste can be identified simply by standing still and observing for 30 minutes. ◆

Ron Pereira is a member of the iSixSigma Editorial Advisory Board. He covers Lean topics in his LSS Academy blog and recently released a free overview video on "Dealing with the 7 Deadly Wastes."

A Brief History of Lean

Many people and developments have been instrumental in shaping Lean. Key moments are described here.

1913 The first moving assembly line was built at Ford Motor Co. in Highland Park, Mich., USA. A chassis was pulled slowly across the factory floor.

1924 Sakichi Toyoda invented the world's first automatic loom, which could change shuttles without stopping operation. Years earlier he had invented a device that automatically stopped a loom if a thread broke, preventing waste. The concept of *jidoka* – automation with a human touch – was born.

1927 Kiichiro Toyoda, Sakichi's son and the founder (and second president) of Toyota Motor Co., introduced a flow production method using a chain conveyor into the assembly line of a textile plant and later into the body production line at the car company, which was established in 1937.

1949 Taiichi Ohno, who later became an executive vice president at Toyota, was put in charge of a machining shop and experimented with setting up the equipment in various ways to produce needed items in a timely manner. After visits to Detroit, he created the basic framework for just-in-time and empowered production workers to stop the assembly line if there was a problem.

1950 Eiji Toyoda, Sakichi's nephew, traveled to the United States to study Ford's production methods and returned with ideas about how to redesign and innovate on Toyota's processes. Eiji later became chairman of Toyota Motor Corp.

1956 Ohno, who with Eiji's support became one of the chief architects of the Toyota Production System, visited U.S. auto plants and supermarkets, where he conceived the kanban idea of using visual controls.

1978 Ohno wrote the book, *Toyota Production System: Beyond Large-Scale Production.*

1987 John Krafcik, a researcher in the Massachusetts Institute of Technology (MIT) International Motor Vehicle Program (IMVP), proposes a label of "Lean" for the combination of methods pioneered at Toyota. A few years later, *The Machine that Changed the World: The Story of Lean Production* was published, the culmination of MIT's five-year IMVP study.

1988 Ohno's book was translated into English.

TODAY Lean is widely applied in manufacturing and transactional environments across many industries in private, public and government sectors.

SOURCES: TOYOTA MOTOR CORP., FORD MOTOR CO., LEAN ENTERPRISE INSTITUTE