Qualityinfo

Volume 25, Issue 07 *Fortnightly, Free soft copy* **1st July 2023**

ISO 9001:2015 and the Seven Wastes

We have an 'opportunity' with ISO 9001:2015 to address more than product quality. Joseph Juran once warned that ISO 9001 standardizes mediocrity, and users often discover that it does not deliver outstanding or world-class results. This is not because of any inherent problems with the standard, but rather the manner in which organizations use it. If their goal is solely to "get the certificate" to satisfy their customers, the outcome is similar to that of a student who crams for an exam solely to pass the test and get credit for the course. The student may indeed pass the course and learn a few things, but he or she will get far less from the course than one who studies the material to learn and internalize useful skills. The former attitude toward ISO 9001 makes it a costly and time-consuming master, while the latter makes it into a valuable servant. Stephen R. Covey's "Law of the Farm," in his book, *First Things First* (Simon & Schuster, 1994), is highly instructive here.

Although ISO 9001 traditionally focused only on avoidance of poor product or service quality, more recent versions have included "improvement," and ISO 9001:2015 adds clause 6.1, which requires "actions to address risks and opportunities." While we generally think in terms of ISO 9001 as being focused on product or service quality (as that is what is delivered to the customer) and the processes that contribute to such, the new idea of addressing "opportunities" does open up the possibility of going beyond simply thinking about defects or poor quality. While we are looking at our processes and how to address poor quality in order to meet the requirements of ISO 9001, we can, at the same time, look at other wastes in our system.

Poor quality is but one of seven wastes

The fact is that poor quality, the traditional focus of ISO 9001, is only one of the seven Toyota production system wastes. Poor quality is also unlikely to be the most costly of the Seven Wastes (defects, overproduction, transportation, waiting, inventory, motion, processing). ISO 9001 users need to recognize that:

- The other six wastes are largely *asymptomatic*. Unlike poor quality (defects, in the parlance of the Seven Wastes) that usually makes its presence known very quickly, the other six wastes rarely do anything overt to let us know of their existence.

- They can therefore become built into the system, where *their occurrence rate is 100 percent* because people are accustomed to living with them or working around them. The same employees who inspect lots diligently under sampling plans that involve fractional percent acceptable quality levels (AQLs) often do not realize that aspects of their jobs may waste 50 percent or more of their labor.

- The other six wastes *are often far more costly* than poor quality.

Consider for example the trade of brick laying as practiced for thousands of years. Frank Gilbreth discovered in the early 20th century that "the way we've always done it" wasted 64 percent of the masons' labor, and wasted it 100 percent of the time because this was how the job was designed. The original method required the worker to bend over to pick up each brick, which doubtlessly sent him home every night with aching muscles and mediocre pay to show for his work. Even though brick laying is a skilled trade, nobody can pay a mason to do the equivalent of 125 toe touches per hour.

As Frederick Winslow Taylor explained very clearly, "Think of the waste of effort that has gone on through all these years, with each bricklayer lowering his body, weighing, say, 150 pounds, down two feet and raising it up again every time a brick (weighing about 5 pounds) is laid in the wall! And this each bricklayer did about one thousand times a day."

Gilbreth's introduction of a non-stooping scaffold that delivered the bricks at waist level allowed masons to lay 350 bricks per hour, and with far less physical effort. The 225 bricks that could have been laid every hour, but were not laid because of the deficient job design, come to roughly 64 percent of 350. Henry Ford, who grew up on a farm, observed jobs that wasted up to 95 percent of people's work.

"I believe that the average farmer puts to a really useful purpose only about 5 per cent of the energy that he spends.... A farmer doing his chores will walk up and down a rickety ladder a dozen times. He will carry water for years instead of putting in a few lengths of pipe. His whole idea, when there is extra work to do, is to hire extra men. He thinks of putting money into improvements as an expense. Farm products at their lowest prices are dearer than they ought to be. Farm profits at their highest are lower than they ought to be. It is waste motion—waste effort—that makes farm prices high and profits low."

Waste motion is, however, but one of the TPS's other six wastes. Two others are inventory and overproduction, which are inevitably interrelated. If the organization produces more work than it actually needs, this will inflate inventory. A strong argument can be made, in fact, that both these wastes can be rolled up into cycle time, which is the waste of the time of things. Inventory is, per Little's Law, directly proportional to throughput (units per unit time) multiplied by cycle

time (time the work spends in the process). Throughput is good, while cycle time is clearly bad. Inventory may be the result and/or the cause of wasted cycle time. As with labor, 90 percent or more of cycle time can easily be waste. Masaaki Imai described the basic concept as follows. “There is far too much *muda* between the value-adding moments. We should seek to realize a series of processes in which we can concentrate on each value-adding process—Bang! Bang! Bang!—and eliminate intervening downtime.” Stamping machines and punch presses make literal “bangs” when they transform it, and this split second represents the value-adding moment. Everything else, including transportation, handling, and setup, is nonvalue-adding. It goes without saying, of course, that time spent in storerooms and warehouses, and also on container ships (i.e., floating warehouses), is waste.

Henry Ford, in fact, used inventory as a visual control that announced a stoppage in his assembly lines. Work was expected to be under transformation by one or more tools or in very rapid transit via conveyor belt or work slide from one tool to another. The accumulation of any inventory between work stations, therefore, announced a stoppage and got rapid attention. Work that is idle on a hand truck, storage shelf, or even in a *kanban* container, is similarly an open symptom of wasted cycle time rather than something the workforce should take for granted.

ISO 9001 does not address directly the issue of wasted material and energy, either, and even ISO 14001 does not explicitly address material waste that does not harm the environment. As an example, a machining process that makes parts by grinding 85 percent of the stock into scrap metal is not an environmental issue because the scrap is sent back for recycling. The logic of essentially making one billet out of six into parts and recycling the other five, however, must be questioned seriously if alternatives are available. Ford preferred to fabricate small parts and weld them together rather than cast large pieces and machine away substantial amounts of metal for this very reason. Additive manufacturing offers similar advantages today.

Modify your QMS to eliminate all waste

Organizations can build elimination of all the TPS’s wastes into their ISO 9001-compliant quality management systems through the inclusion of Henry Ford’s four simple performance metrics into their objectives—the same objectives that are subject to their management review processes.

These are:

- Waste of the time of things (non value-adding cycle time)
- Waste of the time of people (waste motion that does not generate value)
- Waste of materials

- Waste of energy

All of the TPS's Seven Wastes can be expressed in terms of one or more of these wastes. As an example, "waste of the time of things" is automatically reflected by inventory per Little's Law, and it may also be a symptom of overproduction. Poor quality wastes time, material, and/or energy to replace the nonconforming work, and so on.

The last two performance metrics support ISO 14001 and ISO 50001 because material that is not wasted cannot become an environmental problem, while avoidance of energy waste speaks for itself. Shigeo Shingo, for example, once had to deal with unwanted discharges of paint solvents into water that found its way into Japanese rice paddies. He found that most of the problem was due to paint overspray, and asked the plant manager whether his objective was to paint the parts or the air. Spray nozzles that directed the paint solely onto the parts not only reduced the plant's expenditure for paint; they also eliminated the environmental problem.[7] It is this kind of thinking that makes ISO 9001, 14001, and 50001 profitable.

Sho dan, the Japanese word for a first degree black belt martial artist, does not mean "expert"; it means "first step." Compliance with ISO 9001's requirements means similarly "first step" rather than "world class." It is a necessary and vital foundation with which the organization not only ensures quality but also holds the gains from improvement activities, but it cannot deliver these improvement activities unless the organization treats the standard as the servant rather than the master. ISO 9001 users that treat the standard as a framework for continual improvement realize far greater benefits than those that treat it as something with which they must comply to get a certificate to show their customers.

Published by : D. L. Shah Trust, **Room No. 16, 1st Floor, Gool Mansion, Homji Street, Mumbai 400 001** **email: dlshahtrust@yahoo.co.in** **Ph: 022-22672041** **Subscription: Free on request (soft copy only)**	**Edited by : Hari K Taneja, Trustee, D. L. Shah Trust** **email: dlshahtrust@gmail.com** **Phone: 022-2309 6529** **Subscription: Free on request (soft copy only)**