History of Lean

Any of the seemingly boundless number of managers and executives currently in the midst of a lean manufacturing initiative will likely tell you that it's the best thing since sliced bread--a system designed specifically to reduce the manufacturing enterprise to its bare bones, all the while increasing efficiency in a journey toward skyrocketing profits. In fact, if you don't hear the word "journey," you're probably not talking to someone with real lean experience.

Indeed, lean manufacturing does represent a journey--one aimed at a destination that is all but impossible to reach. Sound vague enough? Not unlike several other quality systems, lean manufacturing has been around for years--decades even--but still remains a mystery to many who haven't been involved with such an initiative. Some might know that it aims at reducing waste or increasing efficiency, but not as many can provide you much more than these superficial definitions, leaving lean something of a cross between a program du jour and a glittering generality. At least one organization, however, is attempting to provide the quality industry--always a fan of the objective--the type of definition it can appreciate: a standard.

Retro lean

Ask U.S. manufacturers about the origins of lean and you'll probably receive a bunch of Toyotas mixed in with a few Fords. Both answers could be considered correct. More than 50 years ago, Toyota Motor Co.'s Eiji Toyoda visited a number of U.S. automobile manufacturing plants. Years later he told Time magazine: "When I went to Detroit in 1950, we were producing 40 cars a day. Ford was making 8,000 units. The gap was enormous."

Nevertheless, Toyoda returned to Japan determined to mimic U.S. automakers' startling production numbers, but do so more efficiently. Together with Toyota's Shigeo Shingo and Taiichi Ohno, Toyoda developed a system whose objective was minimizing any consumption of resources that added no value to the finished product. That system became known as the Toyota Production System, the earliest form of lean manufacturing.

The meaning of lean

There are nearly as many definitions of lean as there are lean practitioners and consultants. Nonetheless, a few basic principles are common to most, if not all, definitions. In short, the aim of any lean initiative is to eliminate waste.

Muda, Japanese for waste, can come in many forms--all of which either add nothing to the finished product or nothing for which the customer is willing to pay. A few examples follow:

- **Transportation**. Any required transportation of products or parts adds nothing from the customer's perspective. Therefore, it should be minimized or eliminated. It's

common for plant redesign or reorganization to be among the first steps in a lean effort.

- Overproduction . This occurs when a part or product is manufactured before it's needed--either before a customer has ordered it or before it can begin the next process in the production system. This results in a backlog of material that must be stored, which adds unnecessary expense and inefficiency. A truly lean enterprise isn't dependent upon speculative market forecasting for determining production runs.

- **Work in progress**. WIP can be caused by overproduction, poor scheduling or long and uneven cycle times. Lean companies ensure that each manufacturing process takes roughly the same amount of time by adjusting the processes themselves or the resources dedicated to each. Additionally, suppliers must be held accountable for reliable delivery of their shipments.

Also inherent to a lean production system is the idea of continuous improvement. The lean executive recognizes waste in any form as a singular enemy, the fighting of which is his or her primary responsibility. Because every process includes some waste, the elimination of all waste is an unattainable goal. On the other hand, lean optimists recognize that this truth means the benefits of a lean system--if diligently pursued--are inexhaustible, too.

Standard lean

If there's a problem with lean, it's that the term is used by so many to refer to dozens of different systems--though most share the same fundamentals. In order to right the resulting confusion of this dilemma, one organization has drafted a standard to define and guide the implementation of lean initiatives for those in its industry. The organization is the Society of Automotive Engineers, and the document is J4000.

"Now automotive and manufacturing companies will have a common definition of 'lean' and a yardstick to measure their lean status, as well as a methodology to compare their operations with the most successful lean operating systems," explains Roy Trent, the director of SAE's Best Manufacturing Practices Automotive Manufacturing Initiative. According to Trent, the standard, Identification and Measurement of Best Practice in Implementation of Lean Operation (SAE J4000), can be used to identify and measure implementation of lean operations in manufacturing companies and may even be useful to automotive suppliers in meeting the continuous improvement program requirements in QS-9000 and ISO/TS 16949.

J4000 covers six lean implementation areas: management/trust, people, information, supplier/organization/customer chain, product and process/flow. It also lists 52 components that provide measurable points of reference for successful lean implementation.

The new standard is the result of SAE's ongoing Best Manufacturing Practices survey program. Last year, lean operation was chosen as the focus of the first AMI survey, after the vice presidents of manufacturing for six major automakers cited lean

manufacturing as the most important success factor in the competitiveness of the auto industry for the next several years.

J4000 evolved from the template created for and used in the survey, which evaluated operations at companies recognized as lean models: Donnelly Corp., Freudenberg-NOK, Johnson Controls Inc., Lockheed Martin Corp., Raytheon Co. and The Timken Co. These companies, both from within and outside the automotive industry, were selected based on input from automotive executives, industry analysts and academics, as well as independent research.

To assist users in interpreting and applying the standard, SAE has also developed SAE J4001, Implementation of Lean Operation Users Manual, and a research report documenting examples of current best practices titled Best Practices in the Implementation of Lean Operation Among Manufacturers. This comprehensive and objective study spanned 12 months and involved lean experts from automakers and academia.

SAE is also currently developing a number of other resources, including lean assessor training and lean assessor certification, to support the standard document. SAE J4000 is available for $59. For more information, contact SAE at (877) 606-7323 or e-mail: publications@sae.org .

Sigma lean

Despite SAE's and others attempts to define and standardize lean, there's a host of lean-based initiatives beginning to pop up that combine other buzzwords. These include "Lean Six Sigma," "Total Lean Manufacturing" and the like.

There's no quality topic more popular than Six Sigma, which focuses on driving defects to a nearly nonexistent level. Because the two systems share so many characteristics and goals, a number of consultants have designed hybrid implementation and training programs, offering the best of both.

Six Sigma and lean both aim to eliminate waste from the supply chain. Both help companies to develop robust products and processes. Both require the deep involvement of top executives but are also dedicated to the notion that the best solutions come from the workers. And both are driven by customer requirements.

Perhaps the greatest difference between the two is that Six Sigma emphasizes management's responsibility to make decisions based on quantifiable and reliable facts, not educated guesses. Though the same could be said for lean, the system's kaizen events promote "open minded" thinking--sometimes even from those outside the department or process under scrutiny--about how to attack the sole enemy: waste.

Leaning toward lean?

It's undeniable that the implementation of lean production systems has saved companies millions of dollars for several decades now. That being said, top management should heed this warning: No quality management system is one-size-

fits-all. There are no magic bullets, and lean isn't right for every enterprise. Most notably, the principles of lean are typically only applied to manufacturing enterprises.

If you're interested in implementing a lean system, there's no shortage of consultants from which to choose. Before you do so, however, you may want to first do some research on your own so that you know what to expect. For example, some consultants tell their clients that lean implementation can take between two and 10 years.

If you do decide to implement lean, there are several things you can do to increase your chances of success:

- **Prepare and motivate your employees**. Your people will ultimately determine whether implementation is suc-cessful. It's important to prepare them for the new focus on--if not obsession with--continuous improvement and waste reduction as well as provide them with the training to be vital participants of such efforts.

- **Communicate**. Work diligently to share information and encourage low-level empowerment, a pillar of any lean system. Those on the shop floor should be able to affect the process, as it is they who are most familiar with it.

- **Take risks**. Because a critical lean technique involves tearing down and reconstructing failing or underperforming processes, it's important to impart an atmosphere tolerant of experimentation--whether successful or not.

- **Be realistic**. During implementation, put rigid performance goals on hold.

Measure results, not the number of completed activities. Remember, lean aims at long-term improvements, not quick fixes.

If the term "bare bones" scares you, consider the implications of your primary competitor using lean to trim fat during these volatile economic times while your organization continues along the same path it's currently on. Lean initiatives can increase on-time delivery rates, reduce variation, simplify scheduling, improve the accuracy of market forecasts, ensure quicker market response, foster workplace culture transformation, trim lead time and promote a more efficient use of resources--all helping you to do more with less.