

## the skinny on lean

**The prophets of lean turned the manufacturing world on its ear. Now they want to do the same for distribution—with just a roll of masking tape and a stopwatch.**

WALK INTO **MENLO WORLDWIDE'S BROWNSTOWN TOWNSHIP, MICH., DISTRIBUTION CENTER**, and your first impression might be that it's a warehouse that hasn't quite caught up to the times. There are no signs of automation, inventory sits on racks, and the facility is eerily quiet. Watch the workers for a moment, and you realize they're getting picking instructions from paper pick lists, not headsets or digital scanners. Frenetic it is not.



But look a little closer, and you'll realize that the layout is meticulously organized, with the location of every cart and barrel plotted down to the last centimeter. And talk to the men and women who run the facility, which Menlo Worldwide operates for Bobcat, Detroit Diesel and General Motors, and you'll discover that the site is a virtual distribution machine—swiftly and efficiently supplying service parts to GM dealers; packaging and delivering parts on a just-in-time basis to GM distribution centers; and kitting, sequencing and delivering parts (also on a JIT basis) to a Detroit Diesel assembly plant.

What you are seeing is Menlo Worldwide's version of a lean warehouse, based on a template for warehouse design developed by Toyota, the company that originated what's now known as lean manufacturing.

The story of what Toyota did to revolutionize automotive manufacturing was first told in the 1990 book *The Machine That Changed the World* by James P. Womack, Daniel T. Jones and Daniel Roos. The title referred not to Toyota's automobiles, but the Toyota Production System, a system designed to "provide best quality [and] lowest cost, and [to] shorten lead time through the elimination of waste," according to a lexicon developed by the Lean Enterprise Institute.

In the years since, the gospel of lean has spread beyond the production line to broader applications in the retail and service industries: auto repair, airlines and computer support, to name a few. And it's not just about manufacturing anymore. In their latest book, *Lean Solutions*, published last year, Womack and Jones outline how lean principles apply to logistics and distribution as well.

### The meaning of lean

Just what does "lean" mean when it comes to logistics and distribution? Different companies have different answers, and that's OK—part of the lean credo is that lean practices must fit the particular company. Menlo Worldwide's version will be different from, say, IBM's.

To understand more about lean and how it applies to distribution, I asked Womack for a brief education on the topic. On the surface, the concept is simple. "All lean is about is creating more value with less of everything," Womack says. "You try to get more with less."

The concept may be simple, but what about the implementation? Womack is reassuring on that count. It's not rocket science, he says. "It's not even model airplane science."

Womack may be understating the case just a bit. Going lean may not require abstract thinking, but it does take perseverance and attention to detail.

### **five easy steps**

In *Lean Thinking*, James Womack and Daniel Jones suggest the following five-step process as a guide to implementing lean principles:

- Identify what your customers expect and determine what value you add to the process. For distribution and logistics, that usually means greater velocity. What it doesn't mean is a lot of handling. Distribution people assume all the handling they do adds value, but customers don't see it that way. "No customer asks if a product has been touched a lot," Womack says. "Most people just want their product. All those touches from a customer standpoint are irrelevant. From an end customer standpoint, less logistics is better."
- Plot the value stream. Identify all the steps involved in moving goods through the system. Womack and Jones encourage the use of value-stream mapping—literally diagramming all the steps in the distribution process, from order to delivery. That diagram may help you spot activities that add no value so that you can eliminate them.
- Make the process flow. Dismantle any roadblocks that prevent the free flow of materials through the facility.
- Pull from the customer. The lean system is a pull system, drawing materials and merchandise into the distribution network based on what customers want (not on hazy forecasts).
- Pursue perfection. Root out any remaining waste. Then do it again, and again, and again.

That becomes evident when Womack describes his experience watching Toyota introduce lean principles to a warehouse in the Boston area in the mid '90s. Like any traditional warehouse, the facility was struggling to maintain tight control, he explains. "Toyota looked at [the facility] and said it [was] grossly under-managed," he recalls. "The [site] had a kind of Wild West spirit. Toyota wanted to stamp all that out.

Toyota, in fact, had very different ideas about how the operation should be run. In its plants and warehouses, Toyota wants operations to be completely methodical, Womack explains. "Everything needs to be visible and run on tightly organized loops of work so that every few minutes, say a 10- to 12-minute picking cycle, every worker gets the same amount of work," he says. "People are working at a steady pace."

### **Details, details**

It's important to note that applying lean principles is not a matter of pushing people harder or automating the operation. It's about designing good processes. Many of the steps would strike a DC manager as plain common sense—for instance, keeping fast-moving items close to the end of pick aisles to limit travel time. What distinguishes Toyota's lean model from other waste-reduction programs is the level of detail and its fixation with accurate location information. "Toyota obsesses with it to get darn near 100-percent storage accuracy," Womack says. "The worst kind of waste is 'treasure hunting.'" Another key characteristic of the Toyota system is frequent reordering. That may seem antithetical to managers who've spent their careers trying to reduce transportation costs, but Womack insists it has paid major benefits for Toyota and others.

Toyota arranges pickups from suppliers as often as four times a day. Suppliers have detailed instructions on how to ship the goods. Toyota DCs ship to dealers every day, based on orders the dealers placed the previous night (except in the case of special orders). Toyota then places orders with its suppliers based on what ships out of the DC.

"The idea is rapid, frequent replenishment," Womack says. True, the system cannot work for every part—some come from Japan. But it works for enough parts to make it pay off handsomely, if it's done correctly. Any flaws in processes show up quickly when inventory levels are based on short cycle times.

Lean principles can be applied to any industry. For example, in *Lean Solutions*, Womack and Jones profile the successful lean distribution program run by Tesco, the giant United Kingdom-based grocer. Under the direction of its supply chain director, Graham Booth, Tesco and its soft drink supplier, Britvic, designed a process whereby Britvic bypasses its own DC and delivers beverages directly to Tesco's facility, which is now set up as a cross-dock operation. From there, trucks fan out to deliver the soft drinks (on store-ready dollies) to Tesco's stores several times a day. The same trucks that deliver the dollies pick up empties, return them to suppliers, and pick up full dollies to bring to the Tesco DC to start the cycle again.

Results have been impressive. Britvic uses Tesco's point-of-sale data to determine exactly what is needed for replenishment, which means orders are based on actual sales, not hazy forecasts. Tesco has realized substantial inventory savings as a result. Then there's the 75-percent reduction in cycle times. Moving a product from the Britvic filling line to the end customer takes just five days, down from 20. Encouraged by its success, Tesco has now applied the techniques to more than half its fast-moving products, Jones and Womack report.

### **Everything in its place**

The pursuit of perfection and obsessive attention to detail that characterize Toyota's lean model are reflected in Menlo Worldwide's 278,000-square-foot Brownstown facility, known as the Great Lakes Lean Logistics Center (GLLLC). Look around, and you'll notice process maps on the wall of a room off the main warehouse. You'll see taped outlines on the floor and walls to indicate the precise location of every cart, every tool, every barrel—often with photos showing what goes where. While leading a tour of the facility, Meaghan Diem, a Menlo Worldwide logistics manager, nudges a barrel back between its taped lines. "Some people think this is organization overkill," she says, "but it makes it almost impossible not to make it right."

Menlo Worldwide's experience with its automotive warehouses bears out Womack's contention that implementing lean processes need not be expensive. "We're seeing zero-cost startups," says Jeffrey Rivera, director of automotive warehousing for the company. Rivera, who is based in the company's Auburn Hills, Mich., office, is largely responsible for implementing lean processes in Menlo Worldwide's facilities. (The Brownstown Township warehouse, which opened in 2003, was the first to go lean.) Those startups, he notes, tend to take only a few days.

Womack says that in the ideal lean system, suppliers would be close by, but he acknowledges that's not always possible today. The Menlo facility is a case in point: Many incoming parts arrive via ocean liner at U.S. West Coast ports, where they're loaded onto stack trains for the cross-country trek. Others are sourced in North America. As for outbound freight, the GM parts distribution operation sends shipments out to more than 4,500 dealers.

Out on the floor, hourly workers are packing shipments for delivery to GM dealers or DCs. Small teams are packing and palletizing parts that will head out the door later in the evening, following a process the workers themselves designed (oftentimes using a table they also designed). The teams plan their work based on paper work orders, pulled down from Menlo's homegrown Supplier Inventory Management System.

Most picking activity at the Brownstown facility is based on a 20-minute work cycle. Managers assign each worker a task that should take 20 minutes (they base their task time estimates on experience and testing). That might mean one or two large parts for one worker, and 15 small parts for another. Diem, who works on lean implementation at Menlo facilities around the world, says the idea is to create a stable, predictable workflow. "We don't have control over what's coming in or going out, but we can level the processes," she says, adding that workers appreciate knowing the plan for the workday at its outset.

One of the steps Menlo Worldwide has taken to prevent disruptions to its workflow is to cross train workers. In time, they become familiar with nearly every process on the warehouse floor. For example, Marcus Price, a team leader currently assigned to the warehouse's Detroit Diesel operations, says he has worked in

receiving, inventory and shipping on the GM side of the warehouse as well as in the Detroit Diesel part of the operation.

### **All on board**

Menlo Worldwide realized from the outset that the lean program's success depended on engaging the hourly employees. Without their cooperation, the effort would be doomed, says Rivera, who worked as a consultant before joining Menlo Worldwide. "I worked with a lot of companies who were trying to implement the latest thing," he says. "You knew they were going to fail. They didn't have the cultural buy-in. We learned the importance of building from the ground up. Now, we have an army of eyes for waste."

The eyes he refers to belong to the floor workers, who are encouraged to speak up when they see ways to improve processes (much like the Toyota system, where any worker can shut down a production line if something is amiss). Price says that 75 percent of the ideas for process improvement come from employees on the warehouse floor. Their ideas have proved essential to Menlo Worldwide's efforts to fulfill its commitment to deliver ongoing cost savings to General Motors.

Though it encourages employees to offer ideas on an impromptu basis, Menlo Worldwide also solicits suggestions through a more formal process: its continuous improvement program. On a regular basis, the company assembles kaizen teams—teams formed to root out waste and inefficiency. Rivera reports that employees at every level participate in these teams, which may also include an engineer and a customer. The teams spend three to five days collecting data, identifying targets—called SMART targets—and preparing an implementation plan. Consistent with the Toyota protocol, their plan must fit on a single sheet of A3 paper. (That's an international standard for paper about 11.7 by 16.5 inches, or more precisely, 297 by 420 millimeters.)

As with any productivity program, there's always the danger that enthusiasm will wane and performance will slacken. To keep performance from backsliding, Menlo Worldwide relies on incentives. All staff members participate in the incentive program, says Robert Blevins, operations manager at the GLLLC. The plan is set up so that their compensation is partially determined by performance against specific KPIs (key performance indicators).

The efforts to keep employees engaged and to reward them for their efforts have brought an unexpected benefit for Menlo Worldwide. Blevins reports that the turnover rate at the facility is less than 2 percent. "People like to work here," he says.

### **Do it yourself**

The lean program's results speak for themselves. Menlo Worldwide reports that warehouse productivity improved 32 percent between January and November last year, measured by gains in lines per hour. Defects, measured as the error rate, dropped by a whopping 44 percent. The on-time percentage for shipments was north of 99 percent in every one of those months, hitting 100 percent in eight of 11 months. And those involved think they can do more. "We're a long way from getting there," says Rivera.

The GLLLC has been a proving ground for lean practices at Menlo Worldwide, and the company intends to spread the word—and the lessons it has learned from its automotive business—across its operations. The third-party service provider, a \$1.3 billion operating company of CNF Inc., also serves clients in the high-tech, retail, chemical/industrial and consumer packaged goods industries.

Though Menlo had the benefit of inhouse expertise, Womack insists that going lean doesn't require a swarm of consultants; a single champion will do. "You only need one guy," he says. "Compared to fixing complicated factories, rethinking logistics and distribution is something you can do quickly and spend little. Toyota did it for almost no cost. It is not some deal where you need to hire an expensive consultant. You could almost do it all yourself."

## **the business of lean**

As interest in all things lean spreads, so does the demand for resources. In less than two decades, the movement has spawned Web sites, training courses, audio cassettes, consulting services, videos, workshops, Webcasts, and an institute and academy, not to mention white papers, articles and books.

Though the lean movement has led to lucrative second careers in consulting for many retired Toyota executives, the messiahs of lean are James P. Womack and Daniel Jones. Womack and Jones, along with Daniel Roos, wrote *The Machine That Changed the World*, the 1990 book that brought the concept to the nation's attention. They have continued to explore the subject in subsequent books, publishing *Lean Thinking* in 1996, *Seeing the Whole: Mapping the Extended Value Stream* in 2002, and *Lean Solutions* last year.

Today, Womack serves as president of the non-profit Lean Enterprise Institute ([www.lean.org](http://www.lean.org)), which he founded in 1997. Based in suburban Boston, the institute is a training, research and publishing organization dedicated to spreading the message of lean. (Womack emphasizes that the institute is an educational organization, not a consultancy. He asks readers interested in finding a consultant to look elsewhere.) Jones is founder and chairman of the Lean Enterprise Academy ([www.leanuk.org](http://www.leanuk.org)), a parallel organization based in the United Kingdom.