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Landscape Forms Cultivates Lean to Fuel Growth Goals

Executive support, experimental spirit feed improvement-minded culture

By Tonya Vinas

Necessity isn't the mother of just invention. It's also the mother of adoption. That was the case at Landscape Forms a decade ago when its low-volume, high-mix product line drove the privately owned Kalamazoo, MI., producer of outdoor furniture to adopt cellular manufacturing. With single-item orders 80% of the time and billings of \$10,000 or less 78% of the time, the company decided the best way to add new products without having to constantly reconfigure production was with cells using single-piece flow.

The plan worked well, but managers suspected lean had more to offer and could help them reach a goal of doubling revenues every five to six years with minimal investment.

“Cells and single-piece flow happened because it made sense for us to grow in a scalable way,” said Becky Fulgoni, vice president for people and manufacturing. “That part stuck, but it sort of stalled at that point. When I got here in 2000, my role was to create a culture, and part of that was working with the manufacturing group because that’s where most of the people were.”

About Landscape Forms

- Founded in 1969 by a landscape architect
- Designs, sells, and manufacturers furniture for public sites
- 250 employees (including 25 sales representatives)
- One location in Kalamazoo, MI; operates four days a week, one shift per day, 10 hours per shift. (Exception: Finishing Department runs on two shifts daily)
- Doubles top-line every five to six years.
- Profitable every year but its first

Since 2000, Landscape Forms has advanced its adoption of lean principles and tools to a sophisticated level beyond manufacturing that has fueled profitability and revenue growth through process efficiency, accelerated product development, and customer responsiveness. On the production floor, cell leaders schedule work, adjust to daily takt time changes, and configure assets (operators and machinery) based on demand; and in offices, accountants regularly experiment with financial statements and reports to find better ways of conveying lean-focused information to plant floor managers and top executives. The engineering staff has reorganized to

be more continuous-improvement focused as well, and works closely with a team of the most experienced production employees to create new and specialized products.

Although the company has always had a culture of entrepreneurship and experimentation -- which helped with the lean transition -- leaders faced obstacles. Managers had to convince top executives to kill an expensive scheduling system prior to implementation, and employees resisted change at times. Fulgoni remembers early kaizen events when operators slumped in their chairs, arms crossed, not wanting to participate. Now, she says jokingly, “We can’t shut these people up.”

Kal Kalkowski, manufacturing systems manager, said this is because top leaders took risks and allowed a wide distribution of decision-making, so employees saw meaningful change immediately and were better able to grasp the potential of lean to directly benefit them.

“Now, when people know we are getting ready for a kaizen event, they know it is going to make a difference,” Kalkowski said. “That mentality feeds a feeling of ‘*When’s the next event? Can I be in on the next event?*’”

Contributors to Success

In 2004, company leaders heard a speech by author and researcher Jeffery Liker. In his book *The Toyota Way*, Liker, a University of Michigan professor, describes the Toyota Production System through in-depth descriptions of 14 essential elements.

“We realized that we hadn’t taken on all 14, and that leveling our load was a foundation piece,” Fulgoni said. “There were a lot of lean tools that we weren’t going to be able to use until we did that.”

The company never implemented a newly purchased \$250,000 system for the challenge of scheduling, which was huge considering their elements of demand:

- Products include benches, tables, umbrellas, and trashcans in specified design families. New design families are introduced up to six times a year. Products have a standard size, but customers can specify custom sizes.
- Customers can order from more than 10 standard product colors or more than 100 different custom-color matches.
- Almost all products ship to an off-site vendor for e-coating before painting. The plant regularly ships two to three loads daily to the vendor, four days a week (five if needed). This introduces a constraint of two days of travel and processing into flow.
- The number of orders can range from 15 to 55 a day and can come from anywhere in the world. Ship dates vary depending upon the status of the projects requiring the furniture.
- Shipments double in the middle months of the year. Demand charts like a classic bell curve.

“The scheduling system they purchased was capacity based, with labor reporting and all that good stuff,” Kalkowski said. “It was very inflexible, and it certainly didn’t allow the cellular managers on the floor to manage their own work, which is critical. We decided to table it until we found something better.”

Halting implementation of the expensive scheduling system was not an easy decision for executives, especially because managers did not have any concrete suggestions on a replacement. But the executives agreed to shelve the system. Fulgoni and Kalkowski said this decision gave them and others a crucial boost of confidence that they were doing the right thing and could experiment without drastic repercussions if early attempts failed.

“It was very hard to talk to people about why the scheduling system was wrong,” Fulgoni said. “When we said, ‘*We just know we can’t go there,*’ we hadn’t created a new schedule yet. So to have the executive team go with it was a big leap of faith. Now, it’s easier to articulate.”

A cross-functional team met for several days putting their ideas on a white board and talking through what would work and what wouldn’t. Some days, they would walk in, look at yesterday’s work on the board, erase it, and start from scratch. Ultimately, the team created an Excel-based scheduling system run by a homegrown algorithm that the company uses still today.

“It basically says ‘*Here are your customer orders for each cell,*’ ” Kalkowski explained. “ We’ll soften or level over each cell on the days that are available before the ship date. It tells the cell leaders what their orders are and what their daily *takt* is going to be -- and we change *takt* each day. That, plus experience in how they can move their people and machines around to adjust to *takt* has been very powerful in leveling our schedule, and we’ve been able to extend it back to our suppliers.”

All products require some mix of fabrication, assembly, e-coating, painting, packaging, and shipping. Together, the production cells comprise the company’s Operations value stream. Other value streams include Distribution, and Studio 431 (custom products).

Cells are designated as *modular furniture*; *launch* (new products and variations on existing); *benches, table/chair/umbrella*; and *trashcans*. Each order has a designation of “ship whenever,” “do not ship before [specific date],” or “ship by [specific date].” The cell leaders use this information to decide what the cell will work on that day; and, if possible, they schedule orders with like paint specifications together to improve flow and reduce paint waste. During slower times, cell members can move to busier cells because they are cross-trained; or, cell leaders schedule continuous-improvement training or events.

Reinventing the production schedule was one of the first jobs Kalkowski attacked when the company hired him in 2005 to reignite its lean initiatives. This accomplishment made other fruitful changes possible.

“The first thing I saw was lots of inventory,” he said. “Yes, there was cellular manufacturing, but we were just stuck on what to do next, and how to move forward. We did a couple of kaizen events to introduce the tools. But with the new scheduling system, we were able to do some concrete value-stream mapping and decide where the pacesetter point of our system was going to be.”

To reduce raw materials inventory, the plant implemented cell-based supermarkets using kanban cards. Two delivery carts supply each cell on an hour-by-hour basis based on kanban card signals. Material handlers monitor the number and type of cards on the floor based on what is scheduled for the shift. (Some inventory is managed onsite by vendors, and they, too, rely on kanban cards to signal stocking quantities). The color red on a card or bin signals supplies that are charged to a specific value stream, while the color blue designates supplies that are recorded as common expenses.

Both buyer/planners and engineers (product development, CAD, and manufacturing) work on “core teams” to coordinate raw material purchasing, new product/process development, and continuous improvement for each product. Manufacturing engineers have responsibility for plant-floor tooling, creation of standard work, and quality. They also assist cells in problem solving and contribute to new product development. Specifically, manufacturing engineers dedicate two-thirds of their time to developing new products and one-third to improvements in order to further the company’s aggressive growth goals. (Twenty-five percent of sales in the past two years came from products launched in the past five years. The goal is to increase new-product sales to 30%.)

Embracing Lean Financial Management

In 2006, Landscape Forms deepened its commitment to lean principles by embracing lean financial management. The financial team grasped onto both aspects of the practices -- using metrics that support lean principles and strategies (*accounting for lean*); and simplifying business processes (*lean accounting*).

The first action CFO Conrad Sutter and Controller Peggy Neale took for *accounting for lean* was to create a [plain-English P&L](#), which in lean financial management replaces the [traditional profit-and-loss statements](#) that most companies use. The cheeky moniker comes from the empowerment principle of lean management. Non-financial professionals generally don’t understand the meaning behind numbers on a traditional P&Ls, a truism that prevents them from taking action to correct problems and be fully responsible for value streams.

“We wanted to put something together so that we at least had something to talk about,” Neale explained. “So we showed this to the management team, discussed it, and decided to use two separate statements [traditional and plain-English] through the end of the year.”

Today the company uses only the plain-English P&L. Costs are grouped as material, conversion, and failure costs. This reflects the principles of lean management, which emphasizes waste elimination (process controls) rather than manipulation of labor, machinery, and other assets (internal controls) to minimize costs. The P&L statements have simplified financial information (for instance, cost variances no longer need to be tracked), and accountants no longer need to interpret the statements for the non-accountants at the company. Anyone with a basic understanding of profit and loss can understand the words and numbers on the statement, and the numbers accurately reflect what is happening within the company. As Neale says, prior to using the plain-English P&L, “We would go through hours of mathematical gymnastics just to come up with bad estimates.”

The financial team also introduced a [value-stream income statement](#) with a [balanced score card](#) that measures three groups of metrics -- operational, capacity, and financial. Managers use this and a high-level scorecard to track performance and continuous improvement on an ongoing basis.

The simplified statements contributed to the financial team's achievement in reaching a one-day monthly closing, but the team streamlined their internal processes in other ways through kaizen. They are using electronic document storage and archiving, purchase cards instead of purchase orders in many cases, electronic vendor invoices, and electronic funds transfers. These improvements decreased the number of accounts payable checks issued by 75%, and revealed a more much more current view of finances.

More importantly, lean financial management has broadened participation in lean and contributed to elevating it to the enterprise-wide culture level as opposed to just cellular manufacturing and inventory reduction. The financial team has embraced its new role as supporters rather than scorekeepers and is confident it can ramp up processes during growth without adding assets. Finance and accounting processes now mirror manufacturing processes, a powerful combination because it provides a true picture of the *creation of or lack of creation of* value within a value stream. It doesn't allow for gaming of inventory, costs, or cash — traditional practices that can mask waste.

“The two worlds are definitely coming together by default,” Kalkowski said. “We are getting tighter and tighter and tighter. We are starting to track [inventory] turns more consciously down to the product level so that we can get to a 30-day window of inventory. And we are a lot better at not losing track of things because everything is so visual and obvious.”

Says Neale, “It has been a very collaborative process, and we have a willingness from both groups not to be afraid because if things don't work the way we planned, we have the power to change them.”

Ready for Take-Off

Excitement and confidence permeate Landscape Forms' staff. Engineers, cell leaders, machine operators, and others proudly show off their scheduling systems and boards, standard work instruction sheets, visual-information cues, and of course, high-quality finished goods.

Kalkowski said one of the keys to building that excitement was demonstrating immediate change and communicating what the change would mean and what it wouldn't mean. The first plant-floor kaizen he led, for instance, halved the space of a cell. He clearly explained that the reduction wasn't about eliminating jobs or work; rather, it was in preparation for growth. The second kaizen, which again halved a cell's space, was what really convinced people of the power of lean, he said.

A quarterly bonus for employees based on company performance also motivates staff, as does a commitment to skills development. Fulgoni said the company has leveled orientation and training. Orientation -- which emphasizes “change is a given” -- spans 90 days for new

employees, and cross-training occurs whenever scheduling permits but on an ongoing and individualized basis. A hefty database of company-wide skill sets supports this.

“We’re ready for that next big hurdle,” Kalkowski said. “We plan to triple sales before we have to add any bricks and mortar. So we challenge the status quo. It’s not even questioned any more.”

Box Score for the Lean Transformation at Landscape Forms

- Conversion costs reduced 14%
- Inventory turns up 400%
- Failure costs reduced 80%
- Sales per employee from \$154,000 to \$250,000
- Two, one-day physical inventories per year, working toward one
- Static plant footprint while sales doubled
- Paint-machine changeover reduced from 30 minutes to 10 minutes
- Order-to-delivery lead time from four weeks to two weeks; moving toward four to 10 days
- Since 2005, the number of employee suggestions has doubled each year

For More Information

The Wall Street Journal and *Winning Workplaces*, a nonprofit clearinghouse for workplace best practices, named Landscape Forms one of the best small workplaces in the U.S. in 2008. Learn more about the company and the award [here](#).

[Lean Enterprise Institute](#) -- Founded in 1997 by management expert [James P. Womack](#), Ph.D., LEI is a nonprofit education, publishing, conference, and research organization with a mission to advance lean thinking around the world. LEI runs monthly regional workshops on basic and more advanced lean tools. These include [Creating Continuous Flow](#) (cell design), [Creating Level Pull](#), and a workshop for implementing lean principles in a job shop, called [Made to Order Lean: Excelling in a High-Mix, Low-Volume Environment](#).

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Glossary

(Adapted from the [Lean Lexicon](#))

Leveling (Heijunka)

Leveling the type and quantity of production over a fixed period of time. This enables production to efficiently meet customer demands while avoiding batching and results in minimum inventories, capital costs, manpower, and production lead time through the whole value stream.

Takt Time

The available production time divided by customer demand. For example, if a widget factory operates 480 minutes per day and customers demand 240 widgets per day, takt time is two minutes. Similarly, if customers want two new products per month, takt time is two weeks. The purpose of takt time is to precisely match production with demand. It provides the heartbeat of a lean production system.

Takt time first was used as a production management tool in the German aircraft industry in the 1930s. (Takt is German for a precise interval of time such as a musical meter.) It was the interval at which aircraft were moved ahead to the next production station. The concept was widely utilized within Toyota in the 1950s and was in widespread use throughout the Toyota supply base by the late 1960s. Toyota typically reviews the takt time for a process every month, with a tweaking review every 10 days.