

UNLEASHING LEAN'S POTENTIAL, ONE BEHAVIOR AT A TIME

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The benefits of lean are well known. For instance, it isn't uncommon for a lean enterprise to see lead times and floor-space needs drop, on-time deliveries rise, and inventory levels fall, just to name a few benefits. Executives from companies in all industries strive to achieve similar results. Some succeed, but others struggle. Why is that? What are the successful lean adopters doing that the struggling firms fail to realize?

The tools used in a lean implementation are widely known, but simply unlocking the lean "toolbox" isn't a sufficient plan of attack. Something more has to happen. As Ralph Linton, a renowned anthropologist, suggested nearly 50 years ago, "If we know what a society's culture

is...we can predict with a fairly high degree of probability whether the bulk of its members will welcome or resist a particular innovation." An organization's culture will ultimately determine whether lean will succeed or fail in the long term. Changing the culture is the responsibility of every individual in an organization from line workers to the CEO.

As you might expect, an organization's culture doesn't shift overnight; it changes one behavior at a time. Based on my interviews with dozens of individuals across two companies that have implemented lean, lean behavior develops as everyone understands his or her role and responsibilities in achieving success. Here's what you and your organization can take away from their lean efforts.

Lean Techniques Are Just Tools, not Drivers for Success

MedScan and MedTech are sister companies located in the southeastern United States. (I've changed the names of the real firms because their parent company was preparing to go public at the time this article was written.) MedTech supplies MedScan with detectors, the primary imaging technology used in MedScan's medical scanners. At the time of my interviews, both companies had been very successful with their lean efforts, which had begun in 2003. (Table 1 displays some of the gains attributable to the lean implementation.) In addition to the operating improvements, the lean efforts produced an estimated one-time savings of almost \$35 million and expected annual savings close to \$30 million. Mind you, the numbers don't lie—implementing lean really worked for these two companies. The purpose of the case study was to determine *why*.

Just as a house can't be built without tools, an organization can't become lean without the lean toolbox. (Table 2 lists several of its common tools and techniques.) The lean toolbox is necessary, but it isn't sufficient to sustain a successful lean transformation.

Over the years, numerous managers, executives, and others have toured lean plants and understood the toolbox, yet their organization failed to realize the benefits of lean. A changed mind-set and culture are vital. As Muhammad Ali once said, "The will must be greater than the skill." The will to transform your organization must be greater than the skills learned. If your organization is unwilling to change its mind-set and culture, a lean transformation becomes just another failed experiment.

A Lean Culture Develops if Everyone Is Involved

The output from each organizational layer shown in Figure 1 creates momentum for the next layer. The vision of lean, created and fueled by top management, provides energy to the organizational drivers to develop a philosophical understanding of lean. The end result is an organization's transformation to a lean culture where lean is no longer an "initiative"—it's a way of life.

Top management's responsibilities are to support and commit to the lean initiative. Without both, there's little

Figure 1: **LEAN SUCCESS LAYERS**



chance of success. Top management must provide vocal support for lean and commit the necessary resources. The output of that support and commitment is a lean vision communicated to everyone. In essence, top management is telling everyone that lean is important to the long-term success of the company, so make lean important in your job. The role and responsibilities for each organizational layer are listed in Table 3.

The top management of both MedTech and MedScan, specifically the owner, believed lean could benefit the companies. He knew something had to change. The current operating environment consisted of too much inventory and poor manufacturing capabilities. The companies targeted \$5 million to \$6 million for an expansion, but the owner felt lean might help lessen these capital expenditures. Additionally, the parent company was anticipating going public very soon, and the owner believed successful lean efforts would translate into a successful initial public offering (IPO).

To communicate his support for the lean initiative, the owner sent an open letter to all employees, stressing the need to continuously improve. The lean efforts also received a separate line item on the budget to translate that vocal support into the resources necessary to move forward with the implementation.

Table 1: IMPROVEMENTS FROM LEAN IMPLEMENTATION

	MEDSCAN	MEDTECH
Inventory reduction	50%	80%
On-time delivery	60% improvement	100% on time
Capacity improvement	100%	45%
Quality improvement	50% reduction in defects	98% first-pass yields

Inventory reduction: percent reduction of total cost of inventory.

First-pass yields: percent of total units that pass through the value stream on the first pass without being repaired, reworked, or scrapped.

Capacity improvement: percent increase in time available for production.

Table 2: LEAN “TOOLBOX” CONTENTS

LEAN PRODUCTION ELEMENT	DEFINITION
5S	Organization and daily maintenance of the work area.
Total Productive Maintenance	Operators are incorporated in the daily maintenance activity.
Setup Reduction	A concentrated effort to decrease the amount of time needed to prepare material and equipment for changing over from product to product.
Standard Work	The establishment of an optimal flow of work activities within a cell or on an assembly line.
Method Sheets	Guidelines or instructions that graphically depict standard operating procedures.
Quality Assurance	A collection of tools used to detect and eliminate defects.
Mistake-Proofing	The use of fixtures and tools to eliminate or reduce the possibility of errors.
Production to Takt Time	Pace of customer demand that is used to determine the required pace of production.
Flow Cells	The grouping of product families in close proximity of one another to eliminate unnecessary material movement.
Visual Controls	The use of visual signals to communicate information about the status of the production line.
One-Piece Flow	The ability to produce one part at a station at a time.
Mixed-Model Production	The ability to make several products on the same line in a random or sequence order.
Point-of-Use Storage	The preparation of work areas for the direct presentation of supplied materials.
Design for Manufacturing	The incorporation of manufacturing capabilities in the design phase of a product in order to make necessary engineering changes due to production capabilities before the new product reaches the production stage.
Complexity Reduction	The decreasing of parts or operations needed for a product by increasing component usage and simplifying the design.
Kanban/Pull Production	The communication system of the manufacturing environment. As materials are consumed at a downstream station, signals are sent back to previous steps in the production process to pull forward sufficient materials to replenish only those materials that have been consumed.
Kaizen Events	A focused improvement exercise during which a cross-functional team spends one to three days improving a production cell, line, or process.
Ergonomic Design	The design of processes to mimic natural human movements, postures, and environment.
Cross-Training	The training of the workforce to perform multiple tasks.

Table 3: LEAN ROLES AND RESPONSIBILITIES

ROLE	RESPONSIBILITIES	RESULT
Top Management	Support & Commit	Lean vision
Organizational Drivers	Drive & Promote	Philosophical understanding
Facilitators	Train & Force	Basic understanding
Lean Champions	Lead & Coordinate	Results-based understanding
Implementers	Implement & Maintain	Lean culture

**The Next Layer:
Organizational Drivers**

At MedScan and MedTech, the organizational drivers were mid- and upper-management personnel who promoted and drove the lean efforts. As Bill, MedTech plant manager, pointedly stated during the implementation, “We’re going to keep driving (lean) because we believe in it.” The organizational drivers’ responsibilities included promoting the lean effort and continually driving home the message that lean works. The end result of the drivers’ efforts was a philosophical understanding of lean: Everyone began to grasp what lean was all about and how the company’s fortunes—and their own—were tied to its successful implementation. For the employees, lean meant job protection. Many employees saw the lean effort as a way for both companies to remain competitive while ensuring they had continued employment.

Though the first two layers involved internal management at MedScan and MedTech, the next layer (the facilitator) was an outside consulting group. Management at both companies strongly believed that an outside consultant serving as the facilitator was instrumental in helping employees push through their initial resistance to change. The facilitator’s responsibilities included lean training at both companies and, if necessary, forcing action when faced with resistance.

For MedScan, resistance began almost immediately. Committing to flow the gantries (the frame housing the detectors and other components of the imaging device) was a significant barrier. From the first day of operations at MedScan, a gantry was placed on the production floor and wasn’t moved until it was completed. Individuals responsible for assembly and testing walked from gantry to gantry instead of the gantry moving down the production line.

Surely employees would prefer not to have to walk from station to station and let the work come to them instead? Nope. Resistance was immediate and vocal at the first hint that the gantries must flow. Several meetings

and training sessions were held where the consultant’s message fell on deaf ears—at all levels. The impasse was eventually overcome when MedScan’s management was finally convinced that they had to reconfigure the manufacturing process so that the gantries flowed. That realization came after the consultant, Rob, emphatically declared, “I’ve never seen lean work if you don’t flow.”

Once they were convinced that the gantries must flow, the lean team moved away from resisting and toward determining *how* the gantries would flow. The solution involved designing and manufacturing special handlers capable of moving the gantries. Ken, general manager at MedScan, believed the team would have continued to resist had Rob been an internal manager.

The facilitator also was responsible for training. Rob and his team trained more than 90% of the workforce at MedScan and MedTech. The level of training ranged from a five-hour lean-awareness workshop for employees who weren’t lean team members to multiday training for the lean teams. The belief was that if everyone had a basic understanding of lean, everyone would be on the same page as to what was occurring on the shop floor.

Champions and Implementers

The next two organizational layers shown in Figure 1—lean champions and implementers—consist of the day-to-day lean teams. Individuals in these layers at the two companies were the primary players in ensuring the basic understanding of lean transferred into results.

Lean champions were the first of these two layers. They led the lean effort and coordinated the work. There were 40 to 45 coworkers across both companies who completed lean champion training. Most of them were shift supervisors, but some line workers were given the opportunity to lead a lean team (for instance, the 5S lean champion, responsible for organizing and maintaining the work area).

The lean champions are charged with transforming the training into results. As with any new initiative, it’s

imperative to find some quick wins. That builds momentum to help extend the lean efforts to all phases of operations. One of the quick wins was creating “shadow boxes” for the tools needed on the production floor. Before shadow boxes, workers had to search through the toolbox to find what they needed. With shadow boxes, which allow the tools to be displayed openly, everything was located easily, saving time and headaches.

The heart of the lean efforts—the muscle, if you will—rests with the implementers, the line workers and support workers responsible for converting the existing system to a lean one. Once the implementers at MedScan and MedTech witnessed the initial results and bought into the lean system, their behaviors began to change. The end result was that lean became a way of life at both companies. As one line worker commented, “Half the time I wouldn’t remember we called it lean . . . it’s just common now.” They saw their jobs becoming easier and less stressful. Almost to a person, each implementer emphatically stated they’d never go back to the way it used to be pre-lean.

The implementers, along with the lean champions, were given ownership of the lean initiative and were expected to suggest improvements as a catalyst for maintaining lean efforts. Upper management repeatedly stated, “We want their ideas.” Employee suggestions were taken seriously, and most of them were implemented to some degree. For example, one suggestion resulted in the installation of a lazy Susan at a work site consisting of three workstations. This allowed everyone to remain at their station while the work was moved via the lazy Susan. While it wasn’t very expensive to implement that particular idea, some of the suggestions resulted in major (and rather expensive) changes. One of the most dramatic changes occurred at MedTech.

Project “Yellow Room”

At MedTech, one of the detector components was very sensitive to natural light and had to be stored in a special room using a nonnatural light. Someone working on the component had to go to the room, retrieve the component, work on it, recalibrate it, and then place it back in the room. Traveling back and forth to the room contributed to a large amount of nonproductive time every day. It also created the need for in-process inventories. An employee suggested converting the lighting throughout the whole facility to the nonnatural light used in the testing room.

Great idea! But would it work?

Several tests were conducted to ensure the components would remain calibrated during the entire production

process. They did, and, after a few more tests and analyses, the production floor lighting was converted to the nonnatural light. That suggestion saved a tremendous amount of time in the production process and reduced in-process inventories by \$250,000. Additionally, the initial costs were relatively small—in the neighborhood of \$10,000. Granted, it took some time getting used to the new lighting scheme, but, within a couple of months, employees had adapted comfortably.

Summing Up: The “Skinny” on Lean

Despite some initial pushback, MedScan and MedTech were able to succeed with their lean efforts because everyone came to understand their roles and responsibilities. The structure presented in Figure 1 provides the foundation to get the lean initiative off the ground, to continue the push down the road, and to sustain the effort long term.

Will your company develop the culture needed to unlock lean’s benefits? As we’ve seen, instituting the tools and techniques necessary to improve flow on the shop floor, allow pull by customers, and instill quality in your products isn’t sufficient to achieve long-term success with lean. Failure to cultivate a lean culture in your company threatens the success those tools and techniques can achieve. (James P. Womack and Daniel T. Jones’s seminal book, *Lean Thinking: Banish Waste and Create Wealth in Your Corporation*, is a must-read for anyone considering implementing lean principles.)

An environment in which everyone understands his or her role and responsibilities is the key to developing a lean culture. Once everyone takes his/her responsibilities seriously, behaviors begin to change. A lean culture begins to grow and provides the foundation for realizing the benefits of lean.

Finally, in case you were wondering, lean did indeed grease the skids for a successful IPO, as MedScan and MedTech went public and were subsequently acquired by an international producer of medical devices. Though the innovative technology developed at the companies was the primary reason for the acquisition, the lean initiative demonstrated that the technology could be produced efficiently, at competitive costs, while maintaining the highest quality and reliability. **SF**

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