FEATURE

PEGASUS COMMUNICATIONS
THE SYSTEMS THINKER®
BUILDING SHARED UNDERSTANDING
VOL. 22 NO. 3 APRIL 2011

"LEANING" INTO ORGANIZATIONAL LEARNING

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As a senior management team, we have always worked hard to create a true learning organization in our firm, Danfoss Socla, a specialized valve manufacturer based in Chalons sur Saône, France. Indeed, we attribute part of our enduring success to our efforts toward continuous learning. In 2002, our parent company asked us to participate in a corporate lean initiative, and we did so with great curiosity. Yet, after initially accomplishing positive results, we became disappointed with the project approach, not seeing how lean could potentially "transform" the firm. The lean tools and initiatives showed promise, but we failed to grasp how they fit with our vision of fostering a learning organization.

As a result, we started a dialogue with one of the authors (Michael), who had academic and practical experience in both the fields of learning organizations and lean transformation. We then decided to "reboot" our lean approach and frame it from a learning perspective, with smaller, more frequent projects involving more people from throughout the company. We also committed to work together more closely to discuss and reflect on the demands of lean implementation and its impact on the company.

The process has been taxing, to say the least, but rewarding both in terms of performance and process improvement. A year after we started, with the onset of the global economic crisis late in 2008, we hit the worst industrial crisis of living memory throughout 2009, and we struggled just as much as our competitors with a sudden 15 percent plunge in demand. Still, we believe that our lean work has helped us steer true in the storm, and as the dust settles, we have not lost too much ground on profitability and have increased our market share.

More surprising has been how much the lean approach has challenged our self-image as a learning organization. We thought we learned, but we were totally unprepared for the steepness of the learning curve involved with lean practice. Lean practice requires not just learning, but *learning how to learn*. The other surprise from the lean work is how far down the ranks the learning needs to occur. Everyone from the CEO to the janitor, every day, must go up their own learning curve.

In reflecting on these eventful years, we asked ourselves: What distinguished the second lean approach from the first? We now believe that lean has to be understood in terms of creating a learning organization, and vice versa. On the one hand, without a commitment to learning, lean can easily devolve into just another Taylorist project in which specialists "fix" the people. On the other hand, trying to build a learning organization without the rigor of the lean toolset may be hard to do. We now believe that to dramatically improve our business performance, we need both to understand the philosophy of the learning organization and to master lean practices through its principles and tools.

This is the insight we will share in this article. For each of the disciplines of organizational learning—personal mastery, mental models, systems thinking, team learning, and shared vision—we will show how we have used the lean tools to leverage those intentions into practical action. None of this work has been easy, and we realize now more than ever that a vast amount remains to be done. However, we are confident that blending both approaches is the key to enduring success.

Personal Mastery

Personal mastery is usually defined as a personal commitment to learning. The overall idea is that a workforce that can learn quicker than its competitors holds a competitive advantage. Two significant challenges exist in generalizing personal mastery throughout an organization. First, you can force people to do many things, but you can't force them to learn. The impulse to learn has to come from inside the individual. Second, most real learning is incidental and occurs serendipitously in the course of one's work rather than in a classroom.

As it turns out, lean practice has three specific ways to generalize a commitment to learning within an organization:

1. Select people carefully on the basis of their demonstrated will to learn. The importance of personal commitment to learning became painfully ob-

TEAM TIP

Design simple, visual ways to track your team's progress from current reality to vision.

Adapted with permission from "The Lean Leap: Lean as a Learning Accelerator" in *Reflections: The SoL Journal on Knowledge, Learning and Change,* Volume 10 Number 3.

vious in the course of our lean work. One of the aspects of lean is to *empower managers by teaching them to solve their own problems and make better day-to-day decisions.* To help them develop these skills, they are expected to complete standardized exercises with their teams (called "kaizen events"), in which they look at issues of ergonomics, quality, productivity, and flow through a set analytical framework and with given targets. The improvement results are nice to have, but they are not the main purpose, which is teaching managers to better understand—and thus better manage—their own processes.

As the rhythm of these exercises got established, it became apparent that some managers were interested in improving and some were not. This latter group was unable to take their teams to the next level of performance. Over time, this realization led to some reshuffling of the organization. It also shed light on the importance of commitment and ability to learn as the *number one* selection criteria for managerial positions.

You can't force anyone to learn, but you can create an environment in which the gap between where we are and where we need to be is updated real time and obvious at a glance.

2. Create and sustain an environment of creative tension. Lean has a specific practice for sustaining the creative tension that leads to "aha!" moments: the lean "challenge" is about expressing problems in terms of what we *need* to do rather than what we *can* do. For instance, in the past, we accepted that our on-time delivery rate fluctuated, and as long as it didn't become catastrophic, no one but the sales director really worried. The lean approach changed that attitude. We all agreed that to sustain our business model, we needed no less than 100 percent on-time delivery.

Several years later, we still haven't achieved our goal, but we have a much better understanding of how the delivery process works and what to do about it. We started tracking on-time delivery, committed to improve it, and refused any backsliding. Any backsliding triggered serious investigation and deep thinking. This single indicator became the source of many management debates about how to solve the problem and where to place resources.

Robert Fritz has long theorized that tension seeks resolution and that the main driver of innovation is the perceived gap between a vision and current reality. The lean practice of setting challenging targets and tracking progress through simple, handwritten charts on the shop floor is a practical way of reasserting the pull of creative tension on a daily basis. You can't force anyone to learn, but you can create an environment in which the gap between where we are and where we need to be is updated real time and obvious at a glance. On-time delivery is now visible real time on a large screen in the shipping area.

3. Build a work environment with specific learning opportunities in the course of day-to-day work. Learning is incidental; it occurs in the course of work when a specific event triggers an "aha!" experience as we connect the dots unexpectedly. How can this serendipitous process possibly be organized? This is probably where lean practice differs most widely—and most counterintuitively—from the normal industrial way of doing things. Lean processes are designed to *stop* when something goes wrong. If a bad part is identified, the process stops. If the requisite work to replenish what has been consumed is finished, the process stops. If an employee does not follow the standard method of doing things, the process stops. It doesn't stay stopped, but it does stop long enough for the worker to confirm what the issue is and immediately make a correction to get back to standard conditions. The next step is to start a root-cause investigation to figure out the source of the problem and fix it. Stopping the process when there is a problem creates many learning opportunities every day, some small (quickly corrected by training), some large (a source of process improvement).

We haven't yet figured out how to get operators to stop the process when they see something nonstandard—for one thing, establishing the standards is no easy challenge—but we are working consistently on confirming problems. We've also started creating visual signals to show that the process is out of normal conditions, such as red bins for suspect parts. These techniques develop ownership and spur learning in both operators and frontline managers.

Mental Models

In learning organization theory, mental models are the deep representations of reality that people hold. These assumptions about how the world works usually express themselves as espoused theories (what people say they believe and intend to follow) and theories-in-use (how people actually behave and their underlying assumptions). A learning organization seeks to come up with mechanisms to surface these mental models, evaluate them against reality, and change them when necessary.

Lean uses a different vocabulary, but essentially takes the same approach. The first step in the lean process is to clarify the problem you're trying to

solve. A problem is defined as the gap between a standard (espoused theory) and the current situation (theory-in-use). This gap is then explained as cause-effect relationships. In fact, lean practice is a relentless machine for explicating mental models and reducing the gap between espoused theory and theory-in-use. Habits are challenged. Pet theories are disproved. Deeply held beliefs are questioned routinely.

For instance, in our company, we believed that for people to be satisfied, we had to give them flexibility to deal with their life out of work. Consequently, workers were free to choose their work schedules as long as they completed the requisite number of weekly hours. As we established visual performance and process standards, it became obvious that such flexibility was detrimental to both efficiency and teamwork. Although convenient for workers, it did not contribute to their job satisfaction, as they couldn't develop team ownership and solidarity.

As we decided to tackle this issue, the management team decided to institute common work hours (start time, end time, and breaks) to create stable teams on the shop floor. This move generated strong protests from employees and their representatives. We learned that no problem can be solved by arbitrarily applying across-the-board solutions, particularly when it is not shared by all and when individual implications are not taken into account. We thought we had identified a global problem (which we had) and that we could implement a global solution (which we couldn't).

In the end, we still have the goal of creating stable teams and increasing communication, but we have chosen to compromise and attack the issue area by area, taking different circumstances into consideration. Although the shift is now more incremental, it is happening in a more positive manner than our first efforts. We prided ourselves on our learning capabilities, but in most cases, we tended to implement simplistic, across-the-board solutions. We learned to slice situations into different cases and treat each slice as unique.

Systems Thinking

Systems thinking is probably the aspect of organizational learning that most clearly parallels lean. In a nutshell, by giving us a way to view the business as a system rather than a set of coexisting parts, systems thinking helps us avoid boom and bust dynamics in our processes. In taking into account the interrelationships within the system, we can avoid optimizing locally at the expense of global performance. The just-in-time dimension of lean essentially puts systems thinking into practice throughout the supply chain.

Manufacturing companies that do not practice lean tend to use computer-based scheduling systems that tell each production cell what to do when. Lean uses "pull" (you only make what your customer has consumed) to establish customer-supplier links throughout the production process. Each production cell becomes responsible for maintaining its own inventory of finished parts and basically reproduces what has been consumed. Although this process requires detailed upstream planning (a lean practice called "leveling"), it stabilizes the production flow and makes relationships between units explicit.

The impact of establishing pull throughout the production process is twofold. First, because the links of cause and effect are clear, managers better understand how logistical decisions taken at the planning stage can affect the entire chain. In practical terms, for instance, we have been able to significantly improve the synergy between sales promotion campaigns and production capacity. The result is that we have enough products to respond to the increased demand created by a promotion without frustrating customers with unfilled orders or bloating our stocks with finished products we then have trouble selling.

Second, we have considerably tightened the links between processes. The lean challenge is that no work-in-progress (WIP) parts should transit through warehouse storage. All WIP is held at the station that produced it as in a supermarket, waiting to be pulled. Making the change to this new system required drastic reduction of batch sizes, but in doing so, we realized how important it is to be flexible if one's business model rests on quick delivery of a wide catalogue of parts.

Lean differs radically from traditional production models inasmuch as it focuses equally on producing parts and on the information that drives the scheduling of producing parts. In fact, lean modes of production rely on clearly separating each link of the chain and organizing the feedback mechanisms between them. In a lean system, four elements are specified in great detail:

1. **The link's output:** how much of what gets sent to whom and when
2. **The link's pathway:** who does what for whom
3. **The link's connections:** what triggers which exchanges
4. **The link's method:** how the work is done by whom

As our frontline managers learn to specify these four elements in detail and to manage variations, they also acquire a deeper understanding of how different aspects of the system interact: the relationship between scheduling and production, between maintenance and planning, between quality and sales, etc. Here again, learning does not occur

through formal training but through the process of trying to tighten the link and seeing firsthand how the system behaves.

Team Learning

The lean definition of teamwork is "resolving problems across functions." Because stable teams are the basis of lean organizations, what is known as "team learning" in the organizational learning framework plays an important role in lean. Individual employees develop knowledge more quickly if there are robust mechanisms for sharing knowledge and experiencing learning together. Furthermore, "teamwork" specifically addresses the issues of crossing organizational boundaries and facing difficult problems with an open mind.

One of the hardest truths we've had to confront in following lean precepts is how poor we were at actual teamwork. This revelation came as something of a shock, because we all get along really well in the company, and we thought we were good at working together—which is actually the case. Nonetheless, when lean forced us to try to solve specific issues as a team, we found that we were not better at doing so than anybody else.

Lean is never easy, because it forces you to see the practical consequences of your policies and choices.

For instance, as mentioned above, our lean initiative immediately stressed on-time delivery and quality. We were convinced that we had excellent quality, certainly better than our competitors. While generally true, when we asked the salespeople to systematically describe what complaints they heard about us from our customers, we learned that sales managers spent much of their time trying to cool off unhappy customers. This was a wake-up call, not just on the quality front, but on the fact that, as a management team, we had no shared awareness of the extent of the problem.

Quality problems are difficult to resolve for two main reasons. First, they tend to be non-repeatable, one-off situations that are hard to catch in normal operations; second, they often involve several links in the chain and can't be fixed from one department alone. In this respect, the lean approach taught us to create "platforms" for teamwork; that is, regular working sessions in which members of different functions meet to solve problems together.

For instance, we established quality "marketplaces" in each production shop. When an operator comes across a bad part (either a supplied part or a mistake he just made), he puts the part into a red container at his station, and he calls the team's coordinator. The coordinator conducts a quick analysis and tries to find the cause of the problem and fix it. She places the defective part in a central "marketplace" area. In this central place, defective parts are regrouped by defect types. A cross-functional management team inspects these groups of defective parts each week and focuses on one quality issue after the next. We've already seen spectacular improvements in areas such as paint and assembly—in some instances, reducing defectives by as much as 30 percent annually.

The hard lesson for us here was that getting along doesn't guarantee team learning. For team learning to happen, you have to structure specific platforms for teamwork, where groups regularly examine specific cross-functional issues. We are learning that unless we push the questioning process beyond what all parties easily agree on, we are not learning as a team.

Shared Vision

As you've probably gathered by now, lean is never easy, because it forces you to see the practical consequences of your policies and choices. At the executive level, we've shared a clear strategic vision for years. We make money by delivering quality products, on time, to our customers out of a large catalogue. Yet as we started exploring our operational processes in greater detail, we realized that in many areas, our business model wasn't supported by our actual practices. Worse, when we tried to persuade our frontline managers that they needed to urgently improve their quality and flexibility, we found that many of them resisted the idea as impractical, unfeasible, or both.

The lean tool for achieving shared vision is called the "North Star": clarifying the key dimensions we need to make progress on, so that we do not improve one dimension at the expense of others. The North Star is about formulating an ideal—such as 100 percent on-time delivery, zero defects, one-by-one production in sequence, 100 percent value-added work, low ergonomic risk, zero accidents, suggestions from every employee, and so forth—as well as the key dimensions we need to focus on to get to this vision.

The value of trying to reach these goals became clearly visible as we hit the 2008 crisis. During a period of total uncertainty and brutal retrenching of markets, we could see when we were being pulled away from our intended course. In many cases, we were unable to resist this momentum in the moment, but we did learn not to lose our focus and then to strive to come back on course. On the desire for on-time delivery, for instance, the necessity to reduce any temporary work because of the free-fall crash of demand also severely affected our capacity to deliver to our distributors within a day. After many internal debates, we decided that our commit-

ment to our customers was more important than short-term cost cutting, and while we maintained a zero temporary staff policy for the rest of the company, we softened our stance for the shipping department and hired the people necessary to continue to deliver. As we tackled these and other issues, we also discovered that our commitment to continuous improvement had a reassuring impact on the staff, who not only saw that management was not panicking but also that they themselves could contribute by continuing to make progress every day.

In defining our North Star, we discovered that our shared vision at the executive level was not shared at the frontline management and operator level. We realized that we have never attempted to express our strategic vision in operational terms that would make practical sense at the shop-floor level. The lean approach to shared vision is to express strategic intent in the form of clear problems (such as short production runs in machining, which involve quick tool changes and frequent set-ups, something machining operators are traditionally uneasy with) and to translate that intent on the shop floor by getting people to follow their own indicators and do regular improvement events to learn to fix their own problems. These two basic practices spur endless questions, and we've seen that as progress (or lack of) is discussed, the business vision is progressively shared all the way down to the operating level.

The Blind Spot: Embeddedness

We had been using learning organization concepts to structure our management style for many years—so what did working with lean teach us? To us, the main contribution that lean can make to the field of organizational learning is *embeddedness*: creating learning opportunities throughout the day-to-day production process at all levels. Lean embeds learning in the organization in three fundamental ways:

1. **Lean forces a high speed of learning:** The practice of establishing challenges by drawing a "line in the sand" (what we need to do as opposed to what we can do) considerably accelerates the need to learn.

2. **Lean creates many small learning opportunities in day-to-day work:** Rather than restricting improvement efforts to large issues needing large solutions, lean designs processes themselves as the source of learning.

3. **Lean links learning at the policy level to learning at the detailed work level:** The foundational precept of lean management is "go and see": go into the workplace to see facts at the source. By doing so, senior managers learn to see the consequences of their own policies and figure out what to focus on next.

These three processes explain how lean can act as a "learning accelerator." On the one hand, we have found that lean provides operational tools for embedding learning into everyday operations, making abstract intentions a day-to-day, hour-by-hour reality. On the other, we have also seen that applying lean techniques without the broader frame of establishing a learning organization is structurally disappointing beyond garnering the early low-hanging fruit. Without a relentless focus on individual and collective learning, lean tools can easily be reduced to traditional productivity methods with limited local success and the possibility of damaging the company's social context.

Conclusion

The conclusion we'd like to share is that the lean toolbox offers a pragmatic—and challenging—way to operationalize the intent of organizational learning. We learned from our first, less-than-successful attempt to implement lean that using lean practices without infusing them with the spirit of the learning organization delivers disappointing results. We believe this issue is a general challenge, as many companies adopting lean bemoan the fact that they fail to see transformation. Learning organization theory has much to contribute to the lean field by clarifying the purpose of the lean tools and spelling out for managers what the tools are supposed to achieve: making people before making products.

Old habits die hard, and maintaining the learning impetus day in and day out is by no means easy. The lean approach regularly forces us to confront our weaknesses, misunderstandings, and misalignments. Still, we believe the results are worth the effort, in terms of creating immediate gains, developing future capabilities, involving people in the company, and growing its human capital. We hope this testimony will encourage more managers to open the same door we did, and think deeply about how to merge the learning organization and lean approaches for sustainable competitive advantage. ◘

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