

Creating and Sustaining a Lean Culture of Continuous Process Improvement

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Lean is the automobile manufacturing production system of the Toyota Motor Corporation that many businesses have been trying to reproduce for over 30 years.^{1,2} To desire the benefits of Lean requires direct extrapolation or some parallel of Toyota's manufacturing-based production methods of efficiency and process improvement to different work environments. This is not as easy as it may seem, especially in health care. Most imitators of Lean use a top-down directed approach to projects by using selected improvement and work design tools often wielded by quality professionals or consultants. I believe this misses the critical element of Toyota's success, namely creating a workplace culture that is educated, engaged, trusted, structured, and incentivized to participate in the work at all levels of a Lean enterprise. Therefore, a successful Lean culture of continuous improvement is a work environment in which the leader can walk away and empowered employees can sustain themselves in pursuing higher quality targets by implementing continuous process improvements. As Henry Ford once said, "Quality is doing it right when no one is looking."³ Sounds like a manager's dream, doesn't it?

Jeffrey Liker, PhD, cautions that over 90% of those who attempt Lean fail (personal communication, 2009). But why? Because success in Lean derives from the culture of Toyota, which is founded in the management principles of W. Edwards Deming and the personal philosophy of the company's founders, the Toyoda family.^{4,5} One comes up short without mirroring that cultural base, consisting of a philosophy, a supportive management system, and intelligent approaches to engaging employees to continuously define and eliminate wastes inherent in non-value processes. One is then left with making sporadic process improvements usually at

management's direction. This contrasts with Toyota's culture, which is dedicated to developing human talent throughout the organization to participate in continuously improving the enterprise. Ergo, success is defined not just by performance or financial metrics but by an engaged workforce producing thousands of process improvements and continually striving for higher targets of quality.

If culture is the key, getting started shows good intent but it is said that culture change takes about a decade to establish. Do not be frustrated. Lean success takes time, so to consider Lean as a short-term solution to an acute management crisis would be misguided. In the Henry Ford Health System (Detroit, MI), we have been focused for the past 8 years on transforming our laboratory culture to foster continuous improvement. We have done this by adapting the philosophies of Henry Ford, W. Edwards Deming, and Toyota to evolve a health care version of a Lean culture. This adaptation to health care has been sustained over time and proven to empower our employees to own the quality of their work.⁴⁻¹⁰ I would like to share with you what we have learned in pursuing our vision of a functional culture of continuous improvement across a large system of medical laboratories in the Henry Ford Health System.

Culture

So what is culture? How do you change the culture? But moreover, how do you sustain it? Culture in its most simplified definition is how people are incentivized to behave and the way people think, talk, work, and act every day. Corporate culture is based on a philosophy and supported by

a management system and structures that allow the desired behaviors to take place consistently.

Deming's 14 management principles form the basis for leaders to create a continuous improvement culture as exemplified by Toyota in its Lean production system.⁴ Toyota's tenets, as defined by Deming, provide the philosophical and management basis for pursuing, supporting, and nurturing quality by designing systems that foster doing things right the first time. According to Deming's quality chain reaction, when quality is the driving force of the culture, it will increase efficiency and productivity, decrease costs, and in turn, allow the company to lower prices, attract a higher market share, increase profits, and improve customer satisfaction.⁴ At the core of that philosophy is recognizing the customer as a priority and developing people as the most important resource to achieve that quality by enabling continuous improvement (kaizen) throughout the enterprise. This philosophy must be supported by an appropriate management system that empowers the workforce to pursue higher targets of quality while identifying defects (errors) blamelessly and then effectively using technical tools of process improvement to redesign more efficient, waste-free work.

The philosophy and management principles of Deming foster respect for people and human development, and allow for a culture of respected, empowered, and accountable employees who are recognized for their expertise and knowledge. People development is extremely important as a differentiator of Lean success. This defines the Toyota culture wherein employees (1) are in charge of their own jobs, (2) design their own standardized work, and (3) are authorized to make changes to improve the work.⁵ In a Lean culture, quality is based on the pillars of respect for and development of people who are responsible for the continuous improvement.

This is the basis for creating a culture of continuous improvement and change that sees quality as more than a desirable outcome but as the foundation of a business strategy to remain competitive. The success of this strategy is obvious when comparing organizations in which continuous improvement is at their core. As one measure of business success, the Superfactory 20, a list of the top 20 Lean public companies, has repeatedly showed superior performance and share holder value compared with the 500 companies comprising the Standard and Poor stock market index.¹¹

The Leader, Constancy of Purpose, and Culture Change

Deming's philosophy of work and leadership can be summarized as follows: "Management's job is to 'work on the system' to achieve continual product and process improvement." His fifth management principle calls for

"constantly and forever improving systems of production and services."⁴

It is the role of leaders to create this constancy of purpose toward improving work product and service outcomes at all levels as the basis of a culture of continuous improvement. This would have both an external as well as an internal customer focus because we are all customers and suppliers of each other's work products and services. Leaders must reinforce a cultural transformation in the workers' perception of their work roles. This requires leaders to create structures for empowered workers to be accountable and successful, and to communicate, support, reward, and model this culture of engaged workers who are charged with identifying and resolving defects and eliminating waste. Leaders must be engaged and lead from "the shop floor" to use the manufacturing analogy. It is from this perspective that opportunities for improvement become evident daily at a very granular level. This leader engagement in Lean is more than just walking around to ask how things are going but actively engaging and empowering the worker continuously.

We do not make cars in health care, we make people well and we work differently in a very complex environment of simultaneous hand-offs, multiple interactions, and enormous variability. We do not have a "shop floor" but we do have work as seen by those closest to it at the level of the "bench" and the "bed." Lessons from Lean must therefore be extrapolated to very different work conditions and professional relationships. This is hard work and requires understanding the best from others' work systems, innovating, and adapting those successes to transform our health care culture.

Changing the Way People Work

The structures we create and the support we provide to sustain worker-involved change is critical to its success. Dr. Jeffrey Liker has framed the key issues for leaders intent on truly changing culture as making an investment in their workforce that will result in "a business transformation that puts customers first and does this through developing people. People who do the work have to improve the work."¹² He notes that a different understanding of Lean is evolving in which "As we are progressing on the 'Lean journey,' companies are maturing from process-improvement toolkits to lean value-stream management, to employee engagement in problem solving, to aligned culture focused by self-aware leadership on the right business problems. The companies I teach are begging for guidance on leadership. They have had enough discussion of tools. They understand that path is a dead end. It is the right time for this discussion, but how do you have the discussion?"

Many are initially focused on the so-called tools of improvement but Liker explains that "...There are tools, but

they are not tools for ‘improving the process.’ They are tools for making problems visible and for helping people think about how to solve those problems. Whether it is a kanban or standardized work or 5S, these are tools to set a standard and make the deviation from the standard visible to the work group. Then the work group must develop problem-solving skills to identify the root cause and solve the real problem.” “...Any solution is an experiment that is ‘right half the time.’ If the tools do not change the way people who do the work think about their own processes, the tools are a failure. If leaders do not understand how to use the tools to unleash the creativity and motivation of people, they are not leaders—they are just administering a bureaucratic process.”¹²

It is common for leaders to speak of change in the same sentence as changing culture. But our own experience with culture change these past 8 years in the Henry Ford Production System across all Henry Ford Health System laboratories of 5 hospitals and nearly 800 employees has taught us repeatedly that culture is a desirable but secondary outcome to changing the structure and process that enable and expect employees to work differently. The investment of time and resources in training our people to work collaboratively in the structures that we create enables a continuous push for incremental improvements. This is how leaders incentivize people to behave and ultimately defines our culture. Dr Liker has shared with us that “people development takes 10 times longer than process improvement” (personal communication, 2009). So do not expect miracles overnight from a Lean culture. It takes time to train and form functional problem-solving teams. It is one small step after another that takes you toward the goal. But you must never stop striving. This is the routine of continuous improvement.

Structures to Promote Teams That Solve Problems

Deming encouraged leaders to “Start as soon as possible to construct with deliberate speed an organization to guide continual improvement of quality.”¹⁴ We have learned that Lean success is sustained only when leaders and managers develop the environment, structures, and aligned incentives to foster an educated and trained workforce that is empowered to work horizontally along the path of workflow so that a perfect work product can be produced consistently. Breaking down barriers between departments is Deming’s ninth principle. This is one of the keys to obtaining collaborations with small, granular process improvements at the level of the work that the employees truly own. A Lean culture is successful when workers are informed by metrics of work variation and empowered to make change, in concert with their leader, using the scientific method of data-driven plan-do-check-act

(PDCA). Transforming this culture of work and the structures designed to foster continuous process improvement by the workers is the responsibility of the leader. To begin a Lean journey without thinking through this structural element is toying with failure. Don’t do it.

In a true Lean management culture you do not have to have all the answers anymore. Your people do. The answers you provide are the overarching goals, priorities, organizational structure, reporting relationships, accountability, pace of change, removal of barriers, provision of resources, communication outside the department, and the recognition, reward, and incentive to work in the new order. This approach to work as a leader allows you to continuously tap the creativity of the workforce.

Without a structure there will be potential chaos with so many anxious to use their newfound empowerment. Its one thing to tell someone they are empowered but quite something else to provide a structure to ensure that they act as such by respecting the existing order. This empowerment may range from serving as a leader of a defined work team, representing team members in a customer-supplier meeting, or serving as a team member who consistently signals defective work and its causes through workplace whiteboards.

We have made extensive use of whiteboards as simple tools to help the individual worker and the team communicate within and between work cells, connect work cells horizontally across the path of workflow (or value stream), and make the workplace visual for those doing the work as well as those managing the reliability, consistency, and stability of the work ■ **Figure 1■**. Whiteboards are only fully functional as visual workplace tools when leaders create the enlightened culture that encourages blameless identification of mistakes and provides an organizational structure and reporting relationships that incentivize empowered workers to contribute to daily defect resolution. Through an empowering structure that continually informs the workforce about the quality of their work and charges them with improving it, employees more readily assimilate the mantra of “never accept, make or pass a defect.” This is one core essence of Lean—a continual improvement loop with a shop floor focus by employees who know the nature of their work best.

Structures That Transform and Support a Lean Culture

Your new role as leader is that of cultural transformer. The strategic planning process of top management should be structured to obtain agreement and definition of the quality mission and goals, establish team leader and team member training in process improvement, identify quality targets, and support learning at the shop floor level by the workforce. In

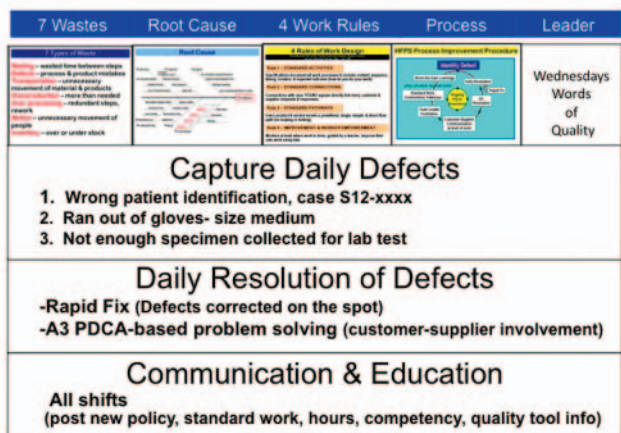


Figure 1 Whiteboards provide a visual structure for workers to participate in the daily identification of defective work product or service.

Toyota’s structure, the team leader is responsible for immediate patch fixes on the shop floor and more sustained process redesign through data-based PDCA change. The team member, who is often on the automated line, is responsible for calling attention to the defects encountered or stopping the line so they can be fixed.

One of the opportunities that has most impressed us as a means of moving toward the ideal condition is Toyota’s fourth “rule in use” as defined by Steven Spear, which states that any improvement must be made in accordance with the scientific method, under the guidance of a teacher, at the lowest possible level in the organization.¹³ That is to say that changes or pilot “experiments” using PDCA are suggested and carried out by those actually doing the work. This approach also facilitates worker buy-in (empowerment) to change and increases compliance with the new work standard. From our own experiences at Henry Ford, we know that when workers contribute to the change, they are more likely to experience ownership. Change then, is not made by but facilitated by the

teacher who is defined as an internal expert, knowledgeable and experienced in the area taught. This also promotes worker accountability.

In health care, we do not have a shop floor or an automated model line producing cars. But we do have analogous opportunities for highly educated and trained workers, not just team leaders, to become engaged in the process of improvement at the level of the work—at the bedside, the clinic, the laboratory bench, the radiology suite, the emergency room, the intensive care unit, the operating room, the kitchen, etc.

Figure 2 depicts the Henry Ford Production System model used for transforming work with a defined quality organizational structure with team leaders and teams that are responsible for work cells. We define a work cell as a semi-autonomous and multiskilled work team that contributes to a task, service, or product that is used by or serves another group in the workplace. If there is no designated team leader for a work cell, make sure that there is one. The designation of a team leader for process improvement does not require Human Resource Department permission. I view this role as an expansion of the job description usually listed as “other duties as assigned.” In an effective Lean culture that “other” box can and should become very large. This team leader is key to driving and facilitating the team-based approach to process improvements at the level of the actual work.

From this structure, opportunity for customer-supplier meetings are fostered for teams to improve processes horizontally as the work flows across existing silos of control. Structure also enables us to more effectively succeed with key Deming management principles 6 through 9, which call for managers and team members to behave differently when encountering problems that they can now resolve in a blameless manner. These principles call for instituting modern methods of training on the job, instituting modern methods of supervision and leadership, driving out fear, and breaking down barriers between departments.

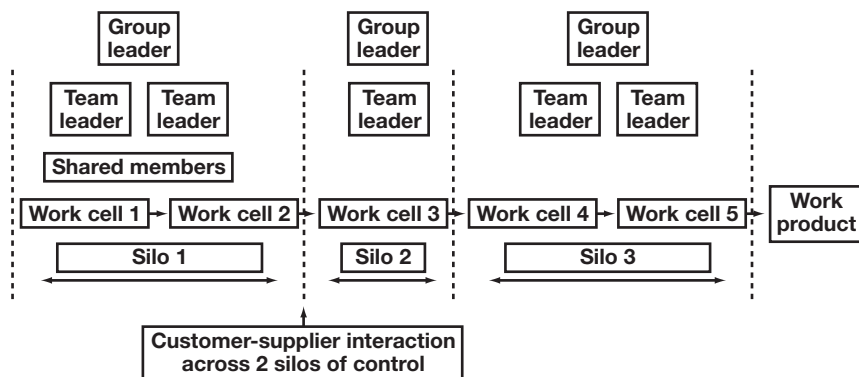


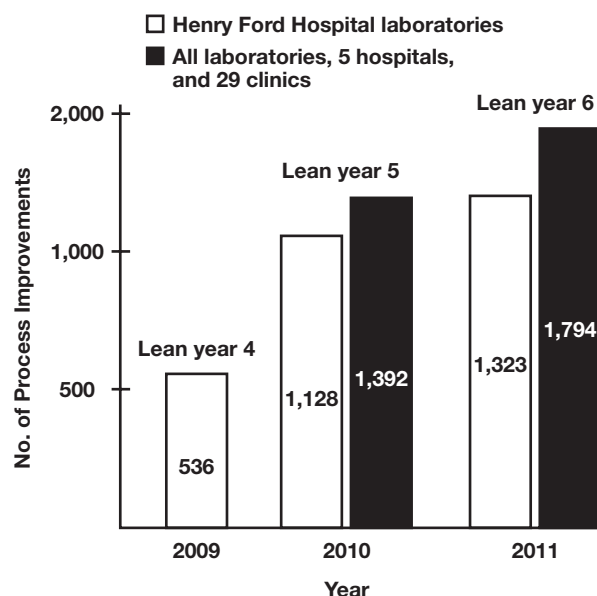
Figure 2 Organizational chart for a quality system structure that facilitates worker-driven continuous improvements at the level of the work, along the path of workflow.

Spreading Learning and Coaching Through “Share the Gain”

To showcase the numerous improvements made by an empowered workforce, and to allow them to understand their importance in the organization, it is important to design a reinforcing and sustaining venue for them to share process improvement lessons with their peers. We hold monthly “Share the Gain” meetings as catalysts to set the pace of change, to educate, and to document measures of success in the new culture of continuous improvement. In 2009, after 4 years of leading and working “Lean,” we assessed total team-based process improvements by laboratory division and hospital. We documented 536 process improvements in the Henry Ford Hospital ■ **Figure 3** ■. The following year, this same workforce produced a 110% increase in quality activity with 1,128 process improvements in the laboratories of Henry Ford Hospital alone. In 2010, after 5 years of working “Lean,” more than half the Share the Gain presentations from the Henry Ford Hospital laboratories were given by the workers themselves, with the remainder contributed by the team leaders and managers. The Lean transformation was extended in 2010 to 2 additional community hospital laboratories and an additional 29 outpatient clinic laboratories, resulting in nearly 1,400 total process improvements that year. By 2011, with all 5 hospitals and medical centers participating, nearly 1,800 process improvements were generated by an empowered workforce of 780 laboratory employees throughout the laboratory service line. These Share the Gain public presentations, with reinforcement of improvement methods and work principles, are a continual learning mechanism that has greatly assisted in sustaining a change in the culture of work and worker involvement in that change.

We have set the pace for change by expecting one process improvement presented per month per team. These need not be completed improvements but can include progress updates of interventions in process or even process improvement attempts that failed. These 1-hour monthly meetings showcase 8 to 10 work cell team presentations in the larger laboratory divisions. Each work cell serves as a “host” of the event on a rotating basis. The smaller community hospitals find it more convenient to hold their meetings within their main laboratory. We encourage attendees to participate in question and answer sessions to reinforce the work principles, rules, and tools applied. Presenters are shop floor workers who are given individual artistic freedom in presentation. This forum allows the workers to not only share their improvements but to receive praise from their peers and be recognized and rewarded by leaders who attend the meetings.

In this era of dwindling ability of leaders to provide economic incentives, it should be noted that employees greatly appreciate this form of recognition of their contribution to the group’s success. As a leader, through this reinforcing



■ **Figure 3** ■ Leveraging employee empowerment is a force multiplier in producing thousands of process improvements at the level of the work in the Henry Ford Production System (Henry Ford Health System, Detroit, MI).

mechanism, you are also developing your next generation of leaders and solidifying your new culture.

I have tried to impress that a successful Lean culture is predicated on Deming’s management style and the value placed on the worker. Through a cultural change mirroring Deming’s principles, reinforcing and sustaining structures can effect continuous quality improvements at all levels by the empowered workforce. The Share the Gain process lives out Deming’s 14th principle, for management to push and sustain this method of work to ensure that the pace of improvement is rapid and the processes of work are ever-evolving and optimizing toward a more perfect state.⁴

Lean Leader’s Checklist

As a leader/manager you might consider the items in ■ **Table 1** ■ as your challenges and pathway to success. Those directly reporting to you or your employees must effectively make use of the principles and tools of work and process improvement before the entire workforce can strive toward continuous improvement. There is much preparation work to be done by leaders and managers before the power of Lean can be achieved beyond the application of tools. As the saying goes, to the man equipped with only a saw, everything looks like a piece of wood. Table 1 lists the guide I have followed.

Creating a functional Lean enterprise is a long journey of many years’ duration. Lean is clearly a combination of

Table 1
Lean Leader's Checklist

Set Lean leadership and management expectation for all leaders.
 Set high performance expectation goals and pace of continual change.
 Integrate people, process, tools, and technology that support the new manner of work.
 Engage and empower your people to solve problems.
 Create organizational structure with identified team leaders to allow continuous change to happen.
 Form core teams with strong leader and team members along the path of workflow.
 Break down barriers between artificial silos of control so improvements can occur horizontally.
 Foster regular communication within and between work cells within your control as well as outside your department (customer-supplier relationships).
 Reduce variability by standardizing the work activities, connections, and pathways.
 Implement visual management, with posted daily metrics of value for each work unit reflecting opportunities for change or stability of process.
 Stabilize processes through a continuous focus on waste reduction.
 Move to continuous flow, innovate triggers to "pull" work or patients, etc.
 Identify opportunities for front loading and work simplification.
 Continually push to reduce time waste.
 Leverage "plan-do-check-act" as a way of thinking and the operational engine of continual improvement.
 Create structure and incentives to sustain the new cultural change of work.
 Make this new approach to work fun!
 Celebrate your teams' successes and learning.
 Educate to improve the overall quality and efficiency of work for the system, not only for any one unit.
 Create opportunities for your direct employees to work effectively together and manage horizontally for the greater good.
 Somebody gives, somebody takes, but everyone wins.

top-down leadership integrated with bottom-up employee engagement. Your leadership role is key to your Lean business success.

To summarize, in the Henry Ford Production System we have adapted to our health care laboratory environment the best of several management structures that reinforce culture: (1) Toyota's line-level organizational structure for quality improvement using group leaders, team leaders, and their respective team members aligned with work cells; (2) team members empowered to represent their team in customer-supplier meetings in the interface as work passes across work cells, units, departments, and hospitals; and (3) process improvements led not by the team leader as at Toyota but by the empowered health care team members themselves. This empowerment of educated individuals in process improvement requires leaders to adopt the Deming style of management rather than merely applying the principles and tools of

Toyota's efficient production system in focused projects. I believe that the best way to adapt to the future environment and guarantee success is by creating strong, educated teams that can resolve challenges that may at first seem impossible. As Deming noted, "Learning is not compulsory, neither is survival."⁴

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