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Building Sustainable Business and People Success through New Ways of Thinking

There are far too many definitions and descriptions of lean systems for all of us to be speaking the same language, and so it seems worthwhile to put forward a unifying view of lean systems. Some have interpreted lean as merely a collection of tools, such as 5S, JIT, kanban, and so on.[1] Others have described lean as working people harder, working people smarter, kaizen, or Total Quality Management. Some definitions are wrong and some are just inadequate.

So how instead can we describe lean systems? At a very high level, lean systems gives people at all levels of the organization the skills and a shared way of thinking to systematically drive out waste through designing and improving work of activities, connections, and flows.[2] By cultivating the skills of a learning organization, creating an environment of real-time learning nearest to the problem or point of impact, all employees can contribute to the robust success of the firm. This simple and universal definition of lean broadens the scope and required skill set beyond traditional views. Many organizations have had great success using lean systems, regardless of how they defined it, towards creating world-class companies.

What we've learned from Toyota

Much of what we can learn about lean comes from the Toyota Production System.[3] Through over 50 years of learning and experimentation, Toyota has driven deep into the systematic elimination of waste and has created a system that learns and adapts better than anyone[4] else. Its reputation for management and manufacturing excellence extends well beyond the automotive industry and truly is a benchmark for all operations and manufacturing companies. One fundamental difference between Toyota and others is the significant involvement of everyone in the improvement process. Many companies we see believe that there are people that do the work and those that solve problems or improve the work. Those that improve the work and processes are usually the least familiar with them, yet the highest paid. With this

model of improvement, the decision of what problems to solve first is a major dilemma. Other companies, although only a few, bring everyone into the problem solving and improvement picture, but only on a very infrequent, large-scale event basis. This usually happens as some sort of task-force or cross-functional team. However, if we operate as a lean system, we can have everyone in the organization focused real-time on solving problems and driving waste out of the organization. In the end, we can enjoy both people success and business success greater than our competitors because we are solving more problems and engaging people at every level.

Two researchers, Steven Spears and H. Kent Bowen, have exposed a standardized way of thinking at Toyota that starts with four rules[4] that have formed the foundation of all of its innovative tools and concepts. We have modified the language and presentation of these rules (but not their intent) in an attempt to make them more usable for people:

The Four Rules

1. **Structure every activity**
2. **Clearly connect every customer/supplier**
3. **Specify and simplify every flow**
4. **Improve through experimentation at the lowest level possible towards the ideal state**

It is easy to read these design rules and think, "We've already done that. We have a book of standards, we've developed process maps for the flows, we know the customer of every process - so what's new?" Of course, the initial reaction will usually prevent someone from really engaging and learning. This very common reaction will shift dramatically if significant time is spent at a Toyota plant. What will then become clear is that the level of depth to which you can take these practices is 1,000 times greater than seemed possible with traditional activities above such as process mapping or standards books. For example, a process map may define what request is made between a supplier and customer, but how thoroughly do we actually consider how that connection between the customer and supplier is carried out? Is it defined to great detail? Is it so clear that there can be no misinterpretation of the signal? If there is a problem or failure with the signal, does someone know? A process map will just show a box with the activity. The depth to which Toyota applies these rules-in-use to the connection between team leader and team member in comparison to most other companies is well worth exploring. In your company, what happens when an employee finds a problem or an opportunity? Perhaps you've told you're employees "feel free to come to me with any problems," but is that really a good application of rule number 2 which states clearly connect every customer / supplier. If it

were a good application, that connection should be direct between you and your employee and it should be binary so that a customer request – such as help in solving a problem – comes only one way and means only one thing. You may not see this rigor as important, so we will explore what happens when the answer to that question is even slightly ambiguous.

A new employee comes to you with a problem that he doesn't know how to solve. You, full of good intentions, tell the employee to try again so that he can learn. He solves the problem, but in the process inadvertently learns that he should exhaust every possible opportunity before coming to you with the problem. One time, the problem is so critical in timing that it could cost the company millions of dollars, but following what he learned, the employee tries everything he can first. By the time he comes to you, it is too late. Both you and the employee had good intentions, but despite these intentions a major problem occurred. Because this problem was such a catastrophe, it creates unwanted attention for that particular employee. As a result, the next time he comes across such a problem, he focuses on sweeping the problem under the rug so that he will not receive all this negative attention. Now, not only does the problem not get attention in a timely manner, but doesn't receive it at all, all because there is significant ambiguity between the employee and supervisor regarding their problem solving process. It would be a safe bet that every disenfranchised and frustrated employee has a story like this one. It is not enough to have good intentions, you need to drive unbending rules into how your organization will operate or it will always eventually revert to its most closed and self-protecting form. At Toyota, the customer / supplier relationship is very clear to everyone. The connection between the customer and supplier is binary, so the request and related response has no waste or opportunity for failure. This is not because the right tool happened to solve this problem, but because lean systems thinking was applied through rule number 2: clearly connect every customer / supplier. The employee is a customer of the team leader's supplied problem solving skills, coaching, and support. That is the first part of understanding the rule. Who is the customer and who is the supplier becomes clear and the service or value being supplied is also clear. Most companies that espouse a belief that their supervisors and management support the worker would not have to look far to see the exact opposite of this belief with comments from supervisors such as "you work for me."

At Toyota, the employee, as soon as she sees a problem and despite whether or not she can solve it, pulls a cord[5] that signals the team leader. That signal is sent by music that tells the team leader that there is a problem and through a signal board that tells him where the problem exists. The team leader shows up, not sometime but immediately, and says "what is the problem and how can I help?" This is direct and binary. Identifying a "problem" directly and always drives the action to "pull the andon cord," and "pull the andon cord" is always followed by the action of "team leader shows up." This happens around 10,000 times a day in a Toyota plant; and through strong problem solving skills at all levels to support that action, they can solve many more times the problems than any other organization can.

The leverage of new thinking

You may read the previous story and think, "OK, so I must design a direct and binary problem solving link between myself and my employees." This is true, but it is just the start as our organizations are very complex and have thousands, perhaps millions, of interconnections, thousands of flows (including material, people, and nformation), and millions of activities. It's actually a daunting problem, and there appears to be no place to start. This is especially true for companies who have traditionally tried to design everything they do in a conference room, as many reengineering efforts have attempted. Toyota has either invented or led in the development and implementation of many tools over several generations. It started with jidoka, the initial concept came from the invention of the automatic loom that allowed the loom to stop as soon as the thread would break, allowing one worker to support 12 machines instead of just one dramatically dropping the cost of weaving. This happened in 1902 and the Toyoda family and Toyota Motor Corporation have never stopped learning. Their success comes from the successful application of ideas such as just-in-time, kanban, andon, heijunka, quality circles, single minute exchange of dies, supermarkets, and so on. This is a long list. Are they just lucky? What is the common thread that ties this all together? Their ability to adopt these ideas, whether generated internally or externally, is made possible by a drive to learn. This drive to learn means they are focused on whatever will help them move closer towards their ideal state and nothing else.

Some of these tools mentioned above have been applied with rigor inside many companies, both automotive and non-automotive manufacturing and even within non manufacturing and administrative processes. Some success is often found through the application and adoption of these tools. Two results are inevitable through this approach, however. First, companies do not reach nearly the level of success desired or come close to Toyota's success. This leads people to either abandon their lean efforts or to search aimlessly for new ideas or programs to adopt. Second, companies do not find their lean improvements sustainable. This leads many people to conclude that lean simply doesn't work in their industry or even conclude that it doesn't work outside Japan.[6] Both of these results can be avoided by recognizing lean not as a collection of tools but as a way of thinking across your company.

While oversimplification of lean will not serve you well, when people ask for the shortest possible definition of lean, the answer given is, "standardized thinking." This means that all employees in your company have a shared way of thinking that serves them regardless of the problems that they face. This in turn means that if a problem or opportunity surfaces that is not addressed by the traditional tools of lean, the shared way of thinking can address the problem directly and put in place powerful solutions. This is how most of the traditional lean tools probably surfaced in the first place. Lean and TPS[7] are not tools that were put in place; instead, those tools were responses to the problems and opportunities found. Those responses were so powerful because they were well understood by people using shared thinking and because the shared thinking allowed those solutions to work in concert with previous solutions as well as the

solutions and tools to come. Operational and manufacturing companies that have found significant success through or because of their manufacturing assets can be found to have good strategic decision making. Most studies of strategy, and particularly manufacturing or operations strategy, find that more important than the particular individual decisions being made is whether or not those decisions are being made with consistency.8 There are two ways to create this consistency. One method is to have every important decision made by one person. This is very common and can be effective in smaller organizations during times of crisis but can cripple a company in the long-term. The second method is to have all the employees use a shared way of thinking and then make decisions at the point closest to the information needed. This shared thinking will create consistency throughout the organization, making the manufacturing or operations of the company more strategic and able to contribute more to the overall success of the company.9 Very few companies get to this level.

While the first level of defining lean a system is a shared way of thinking, the second level is defining what that thinking is. The strategic goal is to produce exactly what the customer wants when they want it at the price they want with zero waste and everyone safe. The question then is what shared thinking, defined by rules and principles, is most effective at meeting that strategic goal.

Lean starts with rules, not tools

If you have followed my hypothesis so far, you will understand that Toyota has mastered lean through the Toyota Production System to such a level that their performance is extremely robust to outside influences and that learning to be like Toyota requires a long, disciplined journey of learning, engagement and leadership. We have also described most lean transformation plans as efforts of mimicking Toyota. This is insufficient and can lead to disaster. More is needed to guide us that simple descriptions of another company's operating system; therefore, we have crafted a set of principles to guide you through your lean transformation towards the ideal condition.

Principles, rules, theory and concepts are all examples of models. Models are by definition simplifications of reality. Because they are simplifications, there is no one model, no one theory, that is all encompassing and failsafe to use. Models should not be trusted. At the same time, we need them to guide us in action and decision-making. Without models such as principles and rules, life would just be a long series of random experiments without any ability to learn from one day to the next. For that reason, we have articulated a set of principles - a model - of what we think best describes lean systems. These principles can guide us as we learn, experiment and transform our organizations. These principles are not an attempt at completeness, but instead are crafted so that they are useful and effective principles to learn and internalize.

Using principles as a method to organize and align your organization for lean transformation will bring standardized thinking to your organization. Through that standardized thinking, people can

work on making progress with a shared understanding of how the world works, or at least how the company will work. This will create both share mental models and shared vision among those engaged in the effort. Without shared mental models, the team responsible for lean transformation will have words with different meanings, tools with different purposes, and projects heading towards different visions. That is not a recipe for success. It may not be imperative that the team member's mental models are identical with ours, but it is absolutely critical that their thinking is consistent with each other.

Many people have seen the Toyota Production System described as a house with elements such as kaizen, jidoka, and just-in-time. These are historically relevant tools to Toyota, but they don't represent the true heart of the Toyota Production System. Lean systems principles are where the power and leverage truly come from, and are represented as follows:
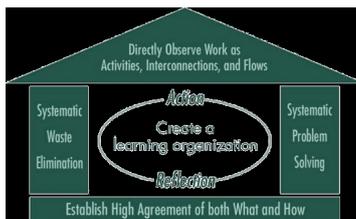
Each principle represents a deeply embedded way of thinking that true lean systems thinkers carry with them. They come alive as a lens on your organization to see new forms of leverage. Most of the tools and methods that we associate with lean today are only applications of this thinking.

Each principle carries with it leverage that can yield significant gains in the overall performance of your organization, but when you put them together, the synergy generated can drive your organization to best-in-class or best-in-any-class.

These are the five principles:

Directly Observe Work as Activities, Connections and Flows

If someone asked you to explain the structure of your organization, you would probably pull out an organizational chart and describe what each department or function does on a daily basis.

Or perhaps you would explain the products, customers, culture and history of the company. All of these are valid views of the organization, but they aren't effective views of the organization for the purpose of improving its performance. For that, we need a different filter, a different way of viewing the current reality of the company.

We all have filters that are conditioned by our experiences, our environment, our education, and so on. We are usually unaware what our filters are, but they have a dramatic, even complete, affect on how we think, what we do, and how we see. Walk through a plant with a controller and ask that controller what he or she sees. He or she will see depreciating assets, inventory turnover, and labor and overhead. Is this view wrong? No, of course it isn't, but it won't help us create a lean company.

There are two elements to this principle.

Structure, operate and improve your activities, connections and flows. If we learn the language of activities, connections and flows, we will see things differently as we walk through the office, the warehouse, the factory, or any organization. This is the language of the lean organization just as credits and debits are the language of accounting. We must learn to talk about activities, connections and flows, think in terms of them, and act on them. Utilizing the four rules while designing, operating and improving activities, connections and pathways is where the bulk of the work of lean transformation should be focused. This will be the makeup of your overall business system. You should be using the same principles when making design decisions as you do when making improvement decisions. Your activities must be structured to the minutest level of detail. Your relationships must be connected as binary customer / supplier links. All goods, materials and information must flow through simple and specific pathways. [10]

Thinking in these terms will help you focus on the right structure of the organization.

Understanding current reality requires deep observation. Many improvement efforts start with a team vision or a blank sheet of paper, but if you were dropped in the middle of the desert and asked to get to New York City, could you do it? Of course not, because you don't know where you are. A deep skill and commitment to understanding current reality is crucial in what makes lean systems transformation different. Current reality does not just mean using measurements; it means direct observation of the activities, connections and flows of the organization. That understanding of the current condition applies to broad company issues such as culture, but also applies to very detailed problems such as why a certain tool isn't working or how to drive waste out of a process. Far too many companies rely on abstractions of reality to tell them where opportunities lie, such as measurement systems or stories. That is not sufficient. Direct observation of activities, connections and pathways is required to understand current reality. Furthermore, that observation requires a framework to digest and expose opportunities.

The four rules are such a framework. Without using a framework to observe, our conclusions will often be vague and incomplete. The use of a framework provides the discipline of being thorough in understanding a current condition, and it also provides the opportunity to be specific about what needs to change. This principle requires a great deal of practice to master.

Systematic Waste Elimination

In any book, article or class on lean, you will hear someone talking about waste. "The purpose of lean," they will say, "is to eliminate waste." I don't believe that is true. First, the purpose of lean is to create a successful and robust business. If companies focus on eliminating the waste in their processes, they will differentiate themselves by being able to provide better quality and delivery at less cost. This particularly comes rue when market pressures increase such as during a recession and the companies that have ignored the waste around them are the companies that end up bankrupt

Second, in many lean efforts waste is talked about but then passed over in favor of preferred tools. If we adopt the principle of systematic waste elimination, we will think and talk in the language of waste and move beyond just memorizing the seven wastes. Then we will see everything our organizations do through that lens.

There are two elements to this principle:

Connect to your customer and always add value. Truly understanding what your external, or paying, customer values and seeking to deliver nothing but, will help avoid waste. Any goal beyond delivering the right product to the right customer at the right time at the right price is waste. Any activity that does not actually change the product being delivered is also waste. Being waste does not mean that something isn't necessary, but if we don't treat it as waste we will never seek to reduce, eliminate or avoid it. Organizations must connect all of their resources to the customer in a flow-path designed to deliver value - nothing else. The information required to deliver that value must flow through the same flow-path. You must have clarity of what your customer values and how you are providing it. This includes internal staff functions, which have customers inside the company. Everyone has a customer, which means that everyone must find ways to add value for their customer.

Relentlessly pursue systematic waste elimination. We define everything that does not directly transform material or information to create value for the customer as waste. This does

not mean the activity isn't necessary. For example, you still need to pay taxes even though it does not add value for the customer. However, waste shows up throughout processes and minimization of that waste is how you move towards your ideal condition. If you can't eliminate the waste, then don't quit; start reducing. If you do this relentlessly and daily for a long enough period of time, you will have a much higher ratio of value added to non- value added work than your competitors, and you may even find ways you never thought possible to eliminate waste. Remember, these principles also apply to the design activities of your organization. This means whether you are designing your supply chain, production process or products, you must seek to avoid the creation of waste in the first place. In fact, the greatest leverage in the war on waste exists in the up-front design and planning processes. Most companies talk about and memorize the seven types of waste, which are:

- Overproduction
- Transportation
- Motion
- Inventory
- Waiting
- Over-processing
- Product / process defects

While teaching people what the types of waste are is a start, few companies develop a passion for eliminating waste. When people walk through the door in the morning thinking "how am I going to eliminate waste today?", you are then starting to adopt this principles. When the ongoing processes and practices of the company systematically address waste, you then have a sustainable effort for the war against waste.

Establish High Agreement of both What and How

The principle of high agreement appears to have the biggest disconnect between current practice and the true intent of lean transformation. Most efforts of lean start with tools that begin to surface the principle of high agreement, tools like the 5S's or visual management. These tools can bring some level of improvement to your organization but they will not transform your culture. The underlying principle behind these tools is to establish a high degree of agreement of both the what of the organization as well as the how. This high agreement should exist whenever coordinated action is required, and therefore for some activities high agreement may be needed across the entire company and in other situations, just two or three people. The rest of the principle of high agreement calls out two specific categories: the what and the how. The

what of the organization is the goals and objectives, and things like what markets we should pursue, what our costs must be to compete, what quality improvement opportunities need to be addressed. Without agreement of the what, an organization will work inconsistently and against itself. While not easy, the goal of getting agreement on the what has generated a great deal of attention, and there are more tools and techniques to support this part of the principle than could ever be consumed by one organization. Often missed, ignored and not understood is the value and challenge of getting high agreement on the how of the organization, specifically, how does the firm produce its results at the granular level of activities, connections and flows. Seeking high agreement of the how provides not just dramatic daily performance improvement, but is the key to making those improvements sustainable.

There are two elements to this principle:

Standardization is the foundation of continuous improvement; create high agreement and no ambiguity. Every improvement, every problem solved and every process changed must be standardized. If it isn't standardized, then you don't have high agreement on how things work. If you don't have high agreement about how things work, then you don't have a strong operating system. Is a standard established from which anyone can identify a deviation that will highlight real problem? If not, then you have not reached a satisfactory level of standardization. Can you ask everyone to stand up, move to a different job, and succeed? If not, you are not done seeking high agreement. Standardization applies to everything from what rules the senior management team will use to make decisions to the pattern used to tighten down bolts during the assembly process; the principle applies to every how and what of the firm. Standardization is not just something you do. It is a continuous process of reaching a deeper and more detailed level of refinement. To make standards clear to everyone, you must do everything possible to make them visual so that you can walk into any process and instantly determine whether things are normal or abnormal. Without this, you will not have continuous improvement. Without continuous improvement, your firm will not be around for much longer.

Sustainable change happens only at the systems level – lean is rules, not tools. Most organizations focus on events, waiting for things to happen; and then they react to those events as they surface, fighting fire after fire. Some people have learned to dig a little deeper and pay attention to patterns and be proactive. But being proactive is still just reacting in advance; you are still a victim to the conditions around you. Tools such as SPC11 help teams become proactive. Cultivating the system, however, is where the leverage lies. The system is the structure within the organization made up of the activities, connections and flows, as well as the mental models12 or ways of thinking. We must pay attention to the systems level and make system changes to make lasting change. This also means that improvements should happen

with people operating in the system as they normally would, not by extracting them from the system to form a problem-solving team or task force. The existing system is where the problems and opportunities lie; work on cultivating the capability of that system to solve its own problems. Only then will you have sustainable change. This is perhaps the hardest element to adopt because we are traditionally very good at and rewarded for fire fighting. We need to learn to be systems thinkers. Using tools such as the 5 Why's to solve problems forces us to dig deeper to a systems level. This results in both more successful problem countermeasures and practice in becoming a systems thinker. Slowly, through repeated use of tools such as the 5 Why's along with the support of a coach, we can learn to think about the system that is in place and improve the system through rules and principles.

Systematic Problem Solving

Every day, every person in your organization is solving problems. No one has the job title of "problem solver" because it wouldn't make anyone unique. All day that is what we do. How we solve problems can make a huge difference in the overall performance and culture of the organization. Does your organization seek out problems and surface them without fear while utilizing a common way of thinking to improve the system of the organization? It is rare to receive an honest "yes" to this question, which is why we must reframe how we think about problem solving. This does not mean we need new tools; the tools, as said many times, already work. It is the thinking and the context around the tools that makes a difference and why systemic problem solving is a crucial principle in lean systems thinking.

There are two elements to this principle:

Seek every problem as an opportunity to focus on the ideal state. Many people have advanced their careers by covering up problems, solving them without anyone knowing, or by waiting for problems to get so large that they require heroic leadership to lead the task force required to get through the crisis. None of these modes of problem solving are acceptable if you want to build a world-class organization. World-class requires teaching everyone to adopt the attitude that every problem is an opportunity. A problem is not just when bad products gets into the customers' hands. A problem is any gap between current reality and the ideal state, and there is always a gap. When someone says "no problem" then you have a big problem, because the gap is actually there, people just aren't recognize the gap. Each of those problems, if addressed, is an opportunity to improve the company, build the organization, and strengthen the flow-path that delivers value to the customer. Many things prevent people from taking the desired approach, such as a lack of emotional and professional safety that enable raising problems without fear of retribution. All barriers to adopting the desired attitude must be eradicated for a company to fully adopt the philosophy that every problem is an opportunity to continuously improve towards the ideal condition. We must redesign the system (or the

activities, connections and flows of the firm) for problem detection and correction whether it is on the plant floor, the design office, or the chairperson's office.

Decision-making at the point of activity. This principle is the hardest for some people to adopt and the easiest to get wrong. The biggest problem is when people are given the authority to make decisions without any guidance or skills in how to make them. Without rules, high agreement about how things work and boundaries, people will make decisions their superiors don't support, and then the superiors will blame the individuals or the concept of pushing down decision making for the consequences of those decisions. The response I often hear is "we tried that and it didn't work." They have no one to blame, however, except themselves. This is the hardest principle for people to adopt because that they have to give up power and control. There are two reasons this principle will strengthen the organization. First, no one person or team of people has enough time to solve all of the problems the organization may face and, so, we must engage everyone. Second, deeply understanding current reality is critical to effectively improving processes, and no one understands those processes like the people who have to deal with them all day long. Making decisions at the point of activity is not meant for the front-lines to solve all of the problems. If a problem exists between an internal supplier plant and its internal customer, then those responsible for that connection must be involved in solving that problem. That is the lowest level possible. Let's connect this principle to the principle of establishing high agreement. In order to make this principle work, we must carefully design how the decision-making and problem-solving processes will work, in addition to pushing decision-making and problem-solving to the lowest level possible.

Create a Learning Organization

Creating a learning organization at every level and through every activity is the most critical of principles. This is the "glue" principle; it holds everything together. Without integrating learning into how your firm works, you are sure to be stagnant. We spend most of our time working in the business that we have, serving customers, solving problems, dealing with employees, but very little time working on the business - such as how the business does what it does.

When there is a problem or breakdown in the company, within the team, or between two people, do you hear questions such as:

- What is it about how we work that allowed this breakdown tohappen?
- How is our thinking serving us well or not?
- Is the system creating unintended consequences such as this breakdown?

- What can we do together to prevent this breakdown from happening again?

If you hear these kinds of questions, you have started to adopt the learning principle. The consistency, frequency, and distribution of these conversations will determine how ingrained this principle is. How many of these conversations result in changing actions – specifically, in changing the system including activities, connections and flows as well as the way people think - will determine how effectively the learning principle has been adopted.

There are two elements to the principle of create a learning organization:

Create frequent points of reflection – be a learning organization. Most organizations limit their learning to training activities, but this should only be a very small portion of the learning activity (don't reduce your training to change the ratio, increase the other activities). Reflection on how the organization works, thinks and improves should be a daily activity integrated with your operating activities. Reflection is not reserved for a 3- day off-site senior management retreat or other such one-time events. Reflection should happen at every level of the organization and at different frequencies. Teams should reflect on their improvement process. Supervisors and their employees should reflect on their role clarity and communication process. The more points of reflection you create, the faster, deeper and more sustainable your transformation process will be. This can happen in the middle of the day and happen spontaneously. The next time you encounter a problem ask, "what is it about how we think or work that allowed this problem to occur?" This conversation cannot happen every time you have a problem, but try it, see the result, and learn under what conditions these conversations should happen. Of course, these conversations require new skills and tools for how we expose our own thinking and the thinking of others and for thinking in the language of systems - activities, connections and flows.

Leaders must be learners and teachers. Throughout lean transformation leaders have new roles. First, leaders must be learners. They must be open to changing themselves and involving themselves deeply in the learning and experimentation process. This requires giving up some control, and it requires being more focused on what is effective than on being right. If the complete and total transformation has not occurred yet, it is safe to say that you have more to learn. Leaders must also be teachers. Simply put, if you can't teach then you can't lead. This doesn't just mean classroom teaching; although that is certainly one place we should see leaders. Leaders also must teach lean systems principles and rules to all involved and demonstrate how they will be used, starting with their own behaviors. They must also ensure that others are teaching the principles effectively. The list of who is considered a leader also changes. Leader is not a title reserved for CEOs and vice presidents anymore. Everyone from

the CEO to line supervisors and workers are leaders. Facilitators are leaders. Change agents are leaders. Union representatives are leaders. Leadership means understanding current reality very deeply and clearly, and having a vision for the ideal state and understanding and ability to close the gap. Focusing on how to close the gap is where the learning of the leader plays a part. Helping others close the gap is where teaching surfaces. Leadership is hard, but worth the effort and is also essential for lean transformation.

These five principles enable us to apply the four rules effectively. The four rules are the laws of lean transformation - they are the bedrock.The principles are the lens and the thinking to enable us to apply the rules and enable lean transformation to come alive. The principles and rules fit together, as show below:
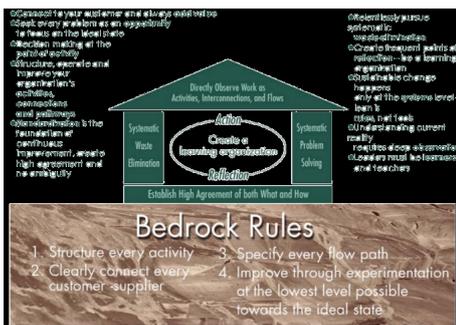
Learn, teach and apply these principles and you will begin to internalize them into your hearts and minds as well as the hearts and minds of those around you.

Starting from your current reality

Understanding the principles and rules of lean systems and applying them are two different things. How to get a company moving in the short- term while keeping in mind the long-term involves many variables. Here are a few key goals to keep in mind.

- *Start changing the thinking of the people in the organization*
- *Move the current reality of the business closer to the ideal state*
- *Learn more about how to move the organization forward*
- *Test the use of the tools against the rules and principles*
- *Develop a commitment to and understanding of the long-term journey*

These goals are the challenge of any significant company transformation. We can start to explore the possibilities by returning our focus to Toyota.

Many people, including Toyota's leaders themselves, have called Toyota a deeply ingrained learning organization.[13] They have been at this for half a century, and they aren't done. In 1999, their Georgetown, Kentucky plant implemented over 150,000 improvement suggestions.
[14]

They have developed many tools and techniques that help them do this, mostly centered on the systematic elimination of waste.
[15]

They have spent a great deal of time and resources working on the flows of material and information and, specifically, all of the interconnections within those flows.
[16]

They have worked on the connections between equipment and workers, including their maintenance and the identification of problems.
[17]

They have structured and improved their work practices in great detail to improve efficiency and effectiveness.
[18]

They have worked to make their processes capable and predictable through quick problem detection and correction.
[19]

They have gone to minute levels to apply the rules and principles to their operating system, the Toyota Production System, over a very long period of time.

There is nothing we can do to jump to the end state of Toyota's learning and just implement the final result. They have been moving through this journey for 50 years, and some of their lessons have been learned almost 100 years ago. The only real answer is to actively cultivate our learning skills and activities to create a learning culture. There is no shortcut to the learning process, although articulating and applying a set of rules and principles as articulated here can help dramatically accelerate the process to years instead of decades. Of course, that sounds just as daunting as designing and improving millions of interconnections. So where can we really start?

We believe that every organization must create a **learning laboratory**, a focused place to learn and experiment, within their enterprise. This is because we only truly learn by doing (which means you aren't really learning by reading this article) and through the integration of doing (action) and reflection. Only when we integrate action and reflection can we begin to understand how to start this long journey.

So what is a learning laboratory? It might look different for each organization, but it is a place where real work is done and where true experimentation and learning-by-doing can take place.[20]

It might be one of your many assembly lines,[21]

a dedicated process team, a customer service center, a specific project or a financial process. The learning laboratory will go through tremendous transformation as everyone works to understand and define what the ideal state of the company might look like. Throughout this process, those closest to the work as well of the leadership of the organization will be engaged in reflection during action so that they can understand not just what does and doesn't work, but why things do and don't work. This is the first step on a continuous journey towards creating lean systems.

Consider a plant that has several machining lines. Pick one area and start by training those involved, not just in the line, but in supporting the line including material, engineering, controller and of course the plant manager and her staff. Train everyone first in the principles and rules. Then start building an improvement strategy based on the current reality. Learn tools as necessary and frequently get everyone together to review what is and is not working and why. Start building lessons-learned as well as a practice for change that can be spread throughout the organization. After creating significant change that others can aspire to and learn from, start spreading the practice to other neighboring areas.

Your practice field or learning laboratory may not be an area within a plant. The automatic response to needing to start lean transformation is "we already have so much going on." Pick one of those efforts and use that project to start learning. This might be the gap that needs to be closed after an ISO-9000 audit or it might be a new product launch or perhaps a plant information technology project. Extra effort will be required to learn the principles and rules and to explore how they are being applied, but the overall effort of lean transformation efforts may be reduced by focusing on efforts already required and underway.

The necessary efforts to transform the system within your company or organization into a lean system are a significant commitment. It requires daily responsibility to maintain focus and overcome significant hurdles in the culture. The journey is worth the effort, however, as the results created for both the business and for the people are far superior to other journeys.

So far I have painted a picture of how your organization may look different having adopted the thinking of lean systems. How one goes about teaching and learning about lean systems depends upon the current condition of the organization, considering such factors as its history, culture, skills and needs. Many companies have tried mimicry, specifically mimicry of Toyota, and that can work to a point, although it can also lead to disaster. You can't learn, or win, by mimicking others unless everything about your companies is exactly the same. Since it never is the same, we have no other choice than to learn and work hard at transforming our organizations given our unique current realities. That's the bad news. The good news is that learning and teaching principles and rules and putting them into practice can get you where you need to go. Therefore, pick an approach and get started, remembering to pay attention to what you're learning. Integrating the principles and rules of lean systems with the necessary tools and actions to improve your current reality will ensure that you are always two steps closer to the ideal state than your competitors.