

Understanding Lean Thinking and Practice Fundamentals

This overview helps beginner and mid-stage Lean Thinkers gain a more comprehensive understanding of lean thinking and practice — and refreshes advanced practitioners' knowledge.

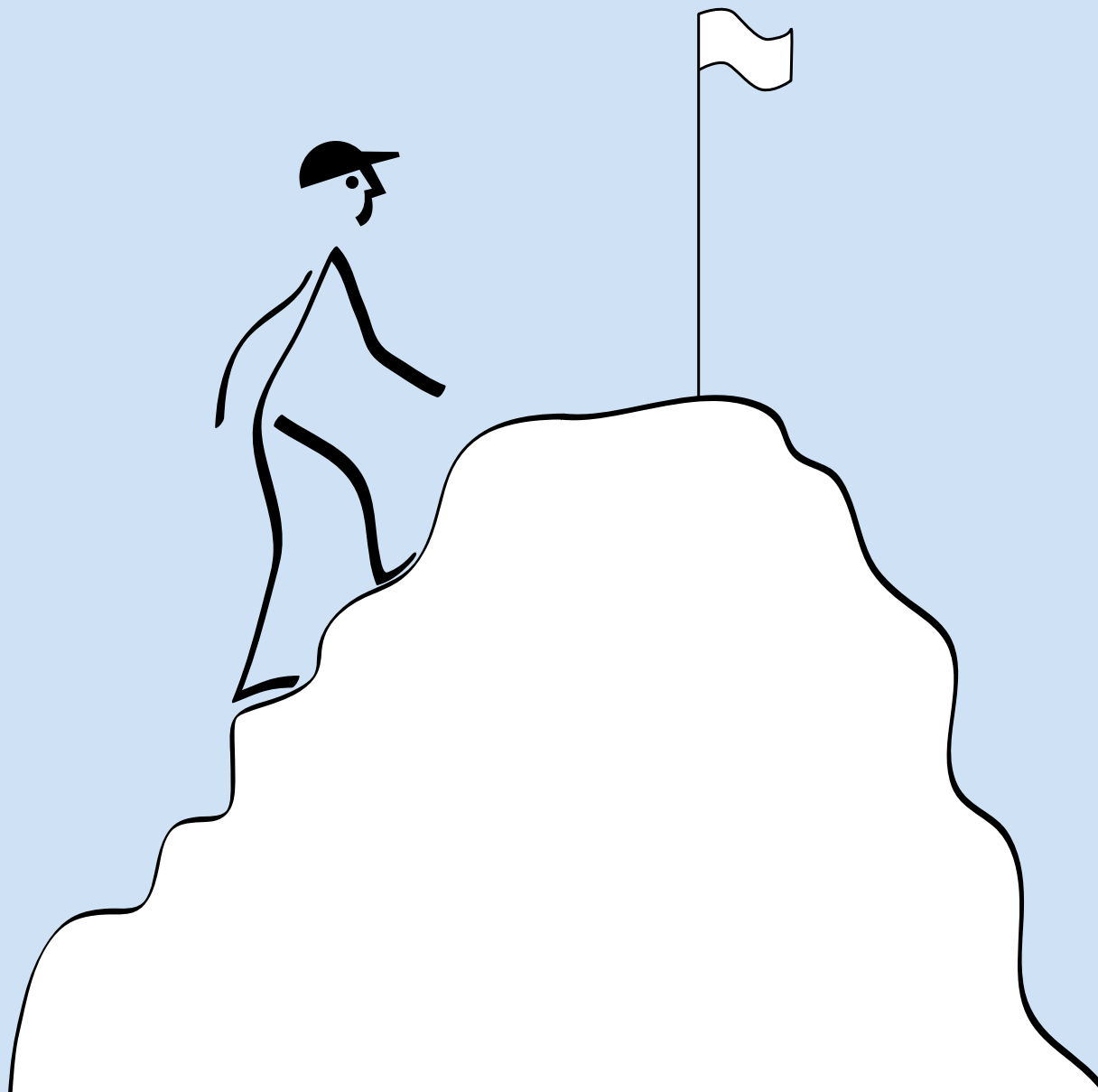


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What is Lean?

Lean is a way of thinking about creating needed value with increasingly fewer resources and less waste. And lean is a practice consisting of continuous experimentation to achieve perfect value with zero waste. Lean thinking and practice occur together.

Lean thinking always starts with the customer. What does the customer value? Or, stated differently and in a way that invites concrete action, what problem does the customer need to solve?

Lean practice begins with the work — the actions that directly and indirectly create value for the customer — and the people doing that work. Then, through ongoing experimentation, workers and managers learn by innovating in their work — be it physical or knowledge work — for increasingly better quality and flow, less time and effort, and lower cost.

Therefore, an organization characterized by lean practice is highly adaptive to its ever-changing environment compared to its peers because of the systematic and continuous learning engendered by lean thinking and practice.

A lean enterprise is organized to keep understanding the customer and their context, i.e., specifying value and looking for better ways to provide it:

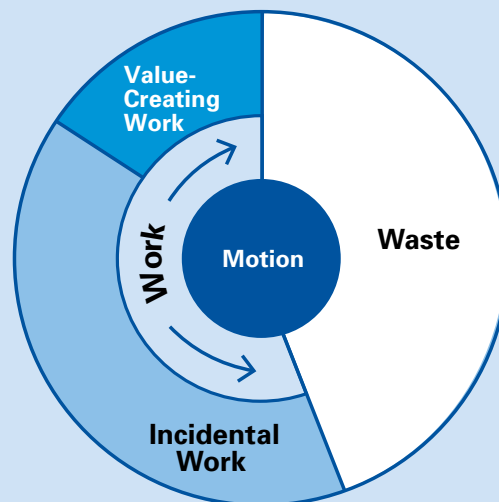
- through product and process development,
- during fulfillment from the order through production to delivery, and
- through the product's and/or service's use cycle from delivery through maintenance and upgrades to recycling.

Work

Human actions (motions) involved in producing products. These actions can be divided into three categories:

- **Value-Creating:** Movements directly necessary for making products, such as welding, drilling, and painting.
- **Incidental Work:** Motions that operators must perform to make products but that do not create value from the standpoint of the customer, such as reaching for a tool or clamping a fixture.
- **Waste:** Motions that create no value and can be eliminated, such as walking to get parts or tools that could be positioned within reach.

Categories of Motion



from the *Lean Lexicon 5th Edition*

LEAN'S ORIGIN STORY: The Birth of a Better Business System

Understanding why and how Kiichiro Toyoda invented the Toyota Production System, the precursor of “lean thinking and practices,” is critical to grasping its purpose and potential in enhancing leadership and organizational performance.

Although there are instances of rigorous process thinking in manufacturing dating back to the Arsenal in Venice in the 1450s, the first person to truly integrate an entire production process was Henry Ford. At Highland Park, Michigan, in 1913, he married consistently interchangeable parts with standard work and moving conveyance to create what he called “flow production.”

The public grasped this in the dramatic form of the moving assembly line, but from a manufacturing engineer's standpoint, the breakthroughs went much further.



Henry Ford

Ford lined up fabrication steps in process sequence wherever possible using special-purpose machines and go/no-go gauges to fabricate and assemble the components going into the vehicle within a few minutes and deliver perfectly fitting components directly to the line-side. This approach was a revolutionary break from the shop practices of the American System that consisted of general-purpose machines grouped by process, which made parts that eventually found their way into finished products after a significant bit of tinkering (fitting) in subassembly and final assembly.



Ford assembly line

The problem with Ford's system was not the flow: He could turn the inventories of the entire company every few days. Instead, his problem was that he could not provide variety. As a result, the Model T was not just limited to one color. It was also limited to one specification — so all Model T chassis were essentially identical up through the end of production in 1926. (In addition to choosing from four or five body styles, a customer could have a drop-on feature from outside suppliers added at the end of the production line.) Indeed, it appears that practically every machine in the Ford Motor Company worked on a single part number, and there were essentially no changeovers.

Then, when the world wanted more variety, including model cycles shorter than the 19 years for the Model T, Ford seemed to lose his way. Other automakers responded to the need for many models, each with many options, but with production systems whose design and fabrication steps regressed toward process areas with much longer throughput times.

Over time, they populated their fabrication shops with ever larger machines that ran faster and faster. This approach seemed to lower costs per process step but increased throughput times and inventories except in the rare case — like engine machining lines — where all of the process steps could be linked and automated. Even worse, the time lag between process steps and the complex part routings required increasingly sophisticated information management systems culminating in computerized Materials Requirements Planning (MRP) systems.

As Kiichiro Toyota, Taiichi Ohno, and others at Toyota looked at this situation in the 1930s and more intensely just after World War II, it occurred to them that a series of simple innovations might make it more possible to provide both continuity in process flow and a wide variety in product offerings. They, therefore, revisited Ford's original thinking — and invented the Toyota Production System.

This system, in essence, shifted the manufacturing engineer's focus from individual machines and their utilization to the flow of the product through the entire process. Toyota concluded that by right-sizing machines for the actual volume needed, introducing self-monitoring machines to ensure quality, lining the machines up in process sequence, pioneering quick setups so each machine could make small volumes of many part numbers, and having each process step notify the previous step of its current needs for materials, it would be possible to obtain low cost, high-variety, high-quality, and very rapid throughput times to respond to changing customer desires. Also, information management could be made much simpler and more accurate.

The thought process of lean was thoroughly described in the book *The Machine That Changed the World* (1990) by James P. Womack, Daniel Roos, and Daniel T. Jones. In a subsequent volume, *Lean Thinking* (1996), James P. Womack and Daniel T. Jones distilled these lean principles even further to five:

1. Specify the value desired by the customer.
2. Identify the value stream for each product providing that value and challenge all of the wasted steps (generally nine out of ten) currently necessary to provide it.
3. Make the product flow continuously through the remaining value-added steps.
4. Introduce pull between all steps where continuous flow is impossible.
5. Manage toward perfection so that the number of steps and the amount of time and information needed to serve the customer continually falls.



In 2007, Womack and Jones simplified the five steps to three — Purpose, Process, and People:

Purpose: The primary purpose of any organization and the first step in any lean thought process is to correctly specify the value the customer seeks in order to cost-effectively solve the customer's problems so the organization can prosper.

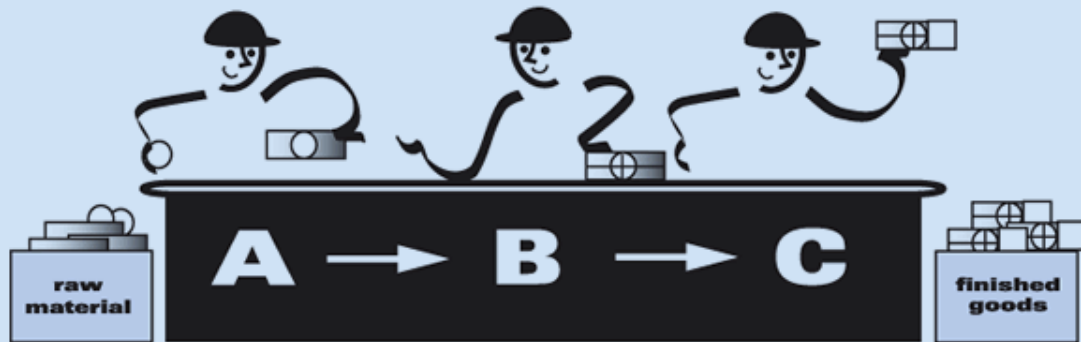
Process: Once the purpose is clarified, focus on the process (value stream) used to achieve this objective, which generally includes the integration of three functional areas of a business: product and process development, fulfillment from order to delivery, and support of the product and the customer through the product's useful life. These primary processes

Continuous Flow

Producing and moving one item at a time (or a small and consistent batch of items) through a series of processing steps as continuously as possible, with each step making just what is requested by the next step.

Continuous flow can be achieved in a number of ways, ranging from moving assembly lines to manual cells. It also is called *one-piece flow*, *single-piece flow*, and *make one, move one*.

from the [Lean Lexicon 5th Edition](#)



are made possible by many secondary support processes inside the organization and upstream.

The ideal value stream is one in which every step (action) is:

- **Valuable:** Meaning that the customer is willing to pay for the step because it creates value and would object if the step was deleted.
- **Capable:** Producing a good result every time.
- **Available:** Being able to operate whenever needed.
- **Adequate:** Having the capacity to keep production in continuous flow.
- **Flexible:** Permitting a range of products within a product family to move through a process without batching and delays.

In addition, in the ideal process, the steps are linked by:

- **Flow:** The product or service proceeds immediately from one step to the next without stopping.

- **Pull:** The next downstream step obtains just what it needs from the next upstream step when continuous flow is impossible.
- **Leveling:** Adjusting task completion from some pacemaker point to smooth the operation of the process while still addressing the customers' needs.

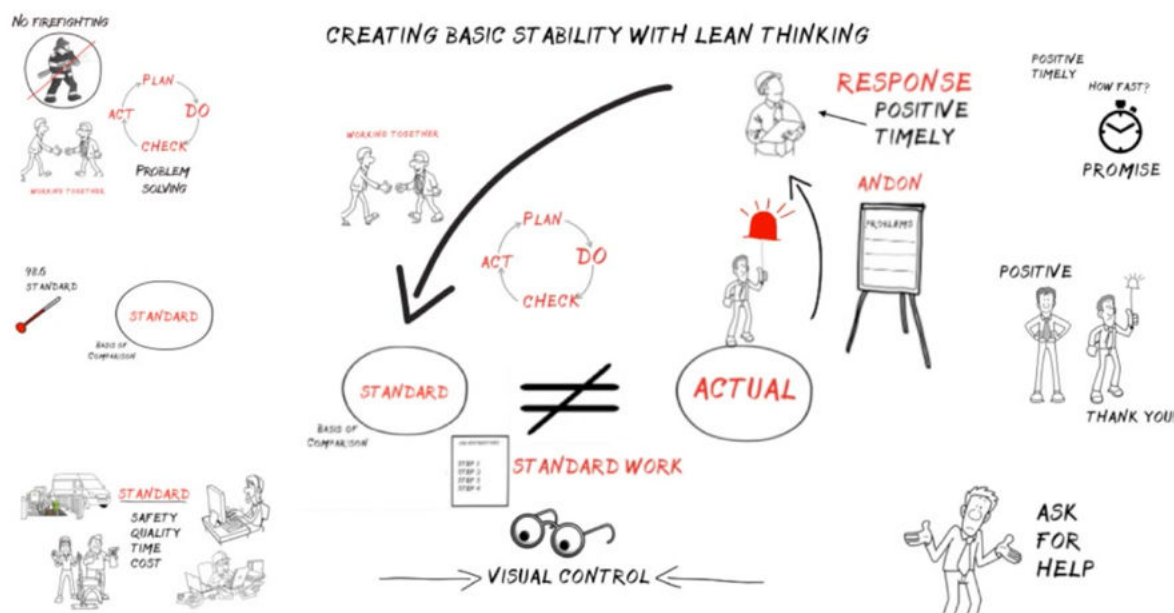
People: After identifying the primary and support processes needed to create value for the customer, make someone responsible for each value stream. This value-stream manager must engage and align the efforts of everyone touching each value stream to move it steadily toward the customer while elevating performance from its current state to an ever-better future state. Doing this requires:

- A master plan for the enterprise, often called strategy deployment, or Hoshin Kanri.
- Frequent improvement cycles for each process, often performed with A3 analysis embodying value-stream maps.
- Standard work with standard management for every step in each process. ■

Lean in One Drawing

An LEI faculty member explains why it's vital to view lean thinking and practice as a system.

By Dave LaHote



The author's animated video illustrates the links between lean tools and practices and how the system creates stability, from which organizations can continuously improve and create organizational advantage.

[Watch the video and read a lightly edited transcript at lean.org/lean-one-drawing.](http://lean.org/lean-one-drawing)

One of the challenges in getting sustained results from lean thinking and practices is understanding them as a system rather than just a collection of tools. Of course, many organizations initially apply lean tools to improve efficiency and reap significant improvements in the short term. But, unfortunately, such an approach only harvests the low-hanging fruit, as waste is everywhere.

“... lean thinking and practices can change an organization fundamentally when leveraged as a system.”

However, lean thinking and practices can change an organization fundamentally when leveraged as a system. I demonstrate this idea in one flipchart drawing when I teach workshops or speak to small groups. This lean-in-

one drawing illustrates how the practices and tools work together with a management system and philosophy designed to support workers and help them be successful in their jobs.

Recently, I turned my hand-drawn flip chart into a whiteboard video that will help you understand how to think about lean as a system and see the linkage between lean tools and how the system can create organizational advantage.

As you watch, pick one of your critical processes and ask yourself to what extent you have all the pieces of the system in place, as I have described. I bet you'll find some missing connections that you can focus on improving.

Then share the video with others in your organization to help them better understand and use lean as a system to create basic stability and continuously improve your work processes. ■

Waste

Any activity that consumes resources but creates no value for the customer. Most activities are waste — muda — and fall into one of two types. Type one muda creates no value but is unavoidable with current technologies and production assets. An example would be inspecting welds to ensure they are safe.

Type two muda creates no value and can be eliminated immediately. An example is a process with disconnected steps in process villages that can be quickly reconfigured into a cell where wasteful materials movements and inventories no longer are required.

Most value-stream activities that actually create value as perceived by the customer are a tiny fraction of the total activities. Eliminating the large number of wasteful activities is the greatest potential source of improvement in corporate performance and customer service.

Muda, Mura, Muri

Muda, Mura, and Muri are terms often used together in the Toyota Production System (and called the Three Ms) that collectively describe wasteful practices to be eliminated.

Muda

Any activity that consumes resources without creating value for the customer. Within this general category it is useful to distinguish between type one muda, consisting of activities that cannot be eliminated immediately, and type two muda, consisting of activities that can be eliminated quickly through kaizen.

An example of type one muda is a rework operation after a paintbooth, which is required to obtain a finish acceptable to the customer from a paint process that is not highly capable. Because a completely capable paint process for fine finishes has eluded manufacturers for decades, it is not likely that this type of muda can be eliminated quickly.

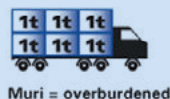
An example of type two muda is multiple movements of products and inventories between steps in a fabrication and assembly process. These steps can be quickly eliminated in a kaizen workshop by moving production equipment and operators into a smoothly flowing cell.

Mura

Unevenness in an operation; for example, a gyrating schedule not caused by end-consumer demand but rather by the production system, or an uneven work pace in an operation causing operators to hurry and then wait. Unevenness often can be eliminated by managers through level scheduling and careful attention to the pace of work.

Muri

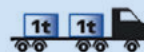
Overburdening equipment or operators by requiring them to run at a higher or harder pace with more force and effort for a longer period of time than equipment designs and appropriate workforce management allow.



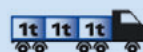
Muri = overburdened



Mura = unevenness, fluctuation, variation



Muda = waste



No Muri, Mura, or Muda

Why Lean Remains a Superior Business Model and Way of Thinking

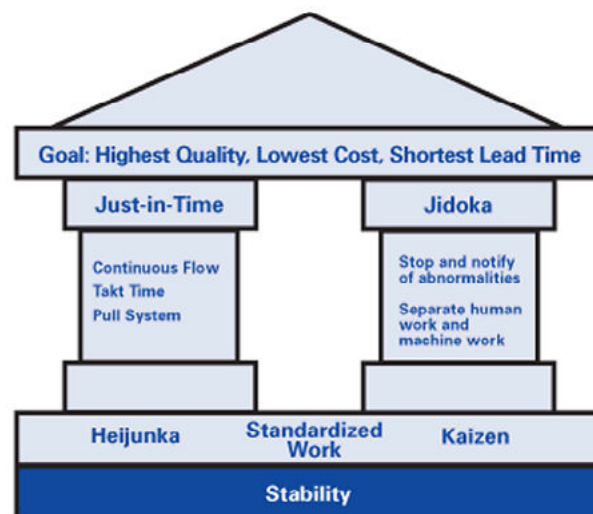
The lean business model offers an alternative to conventional thinking that enables organizations to gain a competitive advantage by being better at helping customers to meet their needs. Here's how.

By Dan Jones

From the time that the Toyota Production System (TPS), or lean production system, was recognized globally, it was clear that it was only one part of Toyota's successful business system. For example, *The Machine that Changed the World*, written by James Womack, Dan Roos, and me, described the superior performance of this production system, which brought together production, supply chain, product development, and selling to create an approach very different from conventional corporate strategy. Still, it took a while before many fully understood that lean production is a part of a more comprehensive lean business system — a perspective Jeff Liker emphasized in *The Toyota Way* in 2004 and other subsequent books.

“... lean production is a part of a more comprehensive lean business system ...”

Over time, it also became clear that viewing the lean system, or TPS, solely as a new set of tools and principles that “experts” could use to design more efficient and integrated horizontal processes misses its real potential. Lean thinking and practices challenge the assumption that only experts should design, maintain, and improve processes and that line management's job is to ensure operator compliance. It also challenges the focus on asset utilization and point optimization, which comes from big organizations' vertical, functional deployment of knowledge and resources. And it challenges the Western assumption that technology is the only way to integrate the sequence of work to design, make, and deliver a product — Toyota achieved this integration well before such information technology (IT) became available.



Toyota Production System

The production system developed by Toyota Motor Corporation to provide the best quality, lowest cost, and shortest lead time through the elimination of waste. TPS is comprised of two pillars, just-in-time and jidoka, and often is illustrated with the “house” shown at right. TPS is maintained and improved through iterations of standardized work and kaizen, following the plan-do-check-act (PDCA) process or the scientific method.

Widespread recognition of TPS as the model production system grew rapidly with the publication in 1990 of *The Machine That Changed the World*, the result of five years of research led by the Massachusetts Institute of Technology. The MIT researchers found that TPS was so much more effective and efficient than traditional mass production that it represented a completely new paradigm and coined the term lean production to indicate this radically different approach to production.

from the [Lean Lexicon 5th Edition](#)

More critically, however, we've come to understand that adopting lean methods is not merely about defining a new "best practice" or system versus point optimization. Instead, it is about seeking accelerating, dynamic economies through engaging everyone — shop floor and management — in using scientific problem-solving to define and continually improve their work, supported by engineers and technology. Michael Balle and the other coauthors of the 2017 book *The Lean Strategy* presented this argument. So, lean principles, practices, and tools are learning frames that help develop individuals' and teams' capabilities, ensuring they can solve the next set of problems and create and build the next-generation product and production systems and future innovations.

We now also understand that having an entire workforce with these problem-solving capabilities makes it possible to integrate value streams without relying on batches, queues, and buffers. In other words, it is capable teams that make streamlined horizontal value streams work in changing circumstances. So, ultimately, lean is a people-centric learning system requiring a very different management system, as described by Balle and colleagues in 2006 in their article "The Thinking Production System."

Value stream analysis is a powerful way of visualizing the potential gains from lean. But, to realize these gains, leaders must build problem-solving capabilities from the bottom up, one step at a time. Otherwise, line managers will again resort to compliance with systems devised by experts. Moreover, developing these capabilities challenges the traditional assumption that strategy can be separated from execution. Lean leaders must lead this execution themselves rather than relying on experts to do it for them.

Lessons from Dissemination

Today we can draw some conclusions from research and experimentation over the past 30 years. The first conclusion is that *lean production practices work in all activities — well beyond high-volume manufacturing*. But although most of the tools and practices are relevant, the starting points and sequence in which they are used to unlock lean's benefits are very different. While high-volume automotive starts with standard work and flow, producing consumer goods begins by separating low-volume products from high-

Problem-Solving

In a lean transformation or any process improvement effort, identifying and closing gaps between current and target conditions.

In a lean management system, everyone is engaged in problem-solving, guided by two key characteristics:

1. Everything described or claimed in the problem-solving process (the problem itself: the target condition, the direct cause, the root cause) should be based on verifiable facts, not assumptions and interpretations. The burden of proof on the problem solver is emphasized through questions such as, How do you know that? Did you go to the gemba and grasp the actual condition firsthand? How do you know you have agreement to your improvement plan?"
2. There is a recognition that problem-solving is never-ending, beginning rather than ending when the implementation of an improvement plan starts. A plan is viewed as a theory of both what will address the problem's cause and what it will take to implement a countermeasure to that cause. The implementation process is a learning process to discover what will be required to progress toward the target condition.

from the *Lean Lexicon 5th Edition*

volume products. Retailing starts with basket fulfillment and rapid replenishment, whereas service and repair begin by turning unpredictable into predictable work. Healthcare starts by unblocking discharge and making the work plan visible. And so on.

The second conclusion is that *things are changing as we move from the era of stable technologies, economies of scale, long supply lines, and big systems*. Initially, lean practitioners saw lean practices as a way of improving the performance of these "legacies of mass production" — big factories, big

Value stream

All of the actions, both value-creating and nonvalue-creating, required to bring a product from concept to launch (also known as the development value stream) and from order to delivery (also known as the operational value stream). These include actions to process information from the customer and actions to transform the product on its way to the customer.

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warehouses, big supermarkets, big airports, big hospitals, etc. Hence the focus on lean production.

But big factories are beginning to be challenged by distributed production closer to customers. Big warehouses are becoming hubs for rapid replenishment. Convenience stores and home shopping are replacing big supermarkets. Point-to-point flights are bypassing hub airports. And overloaded district hospitals are likely to give way to local treatment centers and medical support in the home, described in *Lean Solutions*.

These changes shift the focus from production to distribution and customer service activities on the one hand and engineering, development, and the rapid scaling up of new products and services on the other. Lean is central to rapid replenishment and managing all kinds of service delivery.

Still, it's critical to understand that Toyota's focus was this broad all along, from the beginning of its development of the TPS. For example, Toyota created an incremental four-year development cycle, which has evolved into a superior process for rapidly scaling up new technologies rather than depending on making the occasional giant leap, as described in *Designing the Future* (2019). Both approaches, though, are, of course, needed in a rapidly changing world.

The third conclusion is that, on the one hand, we have achieved widespread awareness of lean across the world, but on the other, *lean programs have often been challenging to sustain over time*. Very often, this was because external consultants or internal lean teams controlled lean training,

redesigned the work and the value streams, and then told frontline teams what to do. As a result, the frontline teams did not sustain the initial successes after the experts had left. (This also happened after the roll-out of Six Sigma programs.) Consequently, many organizations end up using lean teams as cost-cutters or firefighters.

To avoid this, organizations must build a daily management system in which line management learns to help teams to define their standard work as a baseline for improvement, make plan-versus-actual visible, and engage everyone in problem-solving to respond to deviations and to make improvements. To do this, line management and their teams learn by doing, using the plan-do-check-act (PDCA) process through a mentored dialogue using the A3 process in alignment with corporate objectives using a hoshin framework.

In this process, learning is very focused on a specific issue. However, the cumulative experience of repeated learning cycles enhances the organization's ability to formulate insightful hypotheses and possible countermeasures rather than jumping to solutions when tackling problems.

But even lean programs that build a daily management system sometimes fail when top management is distracted by other matters. This situation happened at Tesco after 2011. Sir Terry Leahy headed a top team with significant experience running stores and distribution centers, and all the directors spent one day a week in Tesco's operations every week. As a result, they could quickly understand the potential of the operational improvements revealed by pilot projects for the rest of the business.

As Tesco grew, the next chief executive, Philip Clarke, chose to focus on expanding Tesco's newly acquired operations worldwide and rely on bigger IT systems to improve its operations. And when these failed to deliver, it took a change of leadership in 2014 to recover by going back to basics and refocusing on the UK market.

Successful lean leaders often realize they must lead lean efforts themselves after witnessing them run into the sand. They also recognize the value of having an experienced lean sensei as a dialogue partner to help them, as described in *The Lean Sensei*.

Future Challenges

The shareholder-first business model is increasingly being questioned today. It is no longer credible to ignore the externalities like the impact of the organization on the environment and the challenges from climate change and to rely on workforce compliance from an increasingly skilled workforce that does not share in the profits from dominating markets. Moreover, at the operational level, organizations are full of wasted time, effort, and costs and are slow to respond to change.

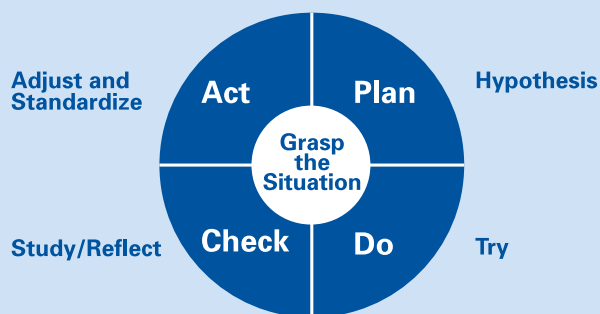
The lean business model offers an alternative. It enables organizations to gain a competitive advantage by helping them be better at helping customers to meet their needs and retaining them rather than dominating markets and controlling customers. In addition, the lean business model is better and quicker at developing and scaling up new product technologies that meet the changing needs of our time. For example, Toyota was the first to commit to replacing the internal-combustion engine and, more recently, to transform itself into a mobility provider. The company also has one of the most comprehensive environmental assessment systems guiding its progress to making its products and operations carbon neutral.

Leaders who use the lean approach to operations are also not driven by the desire to replace people with technology and systems. Instead, they see the intelligent use of technology as enhancing rather than replacing human decision-making. For example, Toyota's operations continue to evolve — most recently, by replacing some robots in assembly with humans, developing very simple physical-assist measures instead of powered devices, and creating a completely new and highly flexible modular production line, Takaoka Line 2.

We still have a lot to learn from the Toyota example. ■

Plan, Do, Check, Act (PDCA)

PDCA is an improvement cycle based on the scientific method of proposing a change in a process, implementing the change, measuring the results, and taking appropriate action. It also is known as the Deming Cycle or Deming Wheel after W. Edwards Deming, who introduced the concept in Japan in the 1950s. It is also known as PDSA, where the "S" stands for "study."



The PDCA cycle has four stages:

1. **Plan** — determine goals for a process and needed changes to achieve them.
2. **Do** — implement the changes.
3. **Check** — evaluate the results in terms of performance.
4. **Act** — standardize and stabilize the change or begin the cycle again, depending on the results.

from the [Lean Lexicon 5th Edition](#)

This article is adapted from Dan's chapter, "Disseminating Lean across the UK: A Personal Reflection," in the publication, The International Handbook of Lean Production, edited by Thomas Janoski and Darina Lepadatu, published by Cambridge University Press.

How to Go to the Gemba: 'Go See, Ask Why, Show Respect'

Here are some guidelines I use when doing a gemba walk as an outside advisor.

By John Shook

Everyone who has caught the lean bug shares at least one symptom: We love to observe work. We love to go to the gemba and watch the value-creating work, the real work of the business. Concluding a recent gemba walk, the question came up, "What do you look for...?" Here are some guidelines I use when doing a gemba walk as an outside advisor.

'Go See, Ask Why, Show Respect'

The words of Toyota Chairman Fujio Cho, "Go see, ask why, show respect," are now famous as basic lean principles. I first heard the words from Mr. Cho himself when I was deputy general manager during the early 1990s startup of the Toyota Supplier Support Center in the U.S. Each week began with a meeting with Mr. Cho, who was acting as an advisor, to discuss activities, progress, problems, and plans.

"Go see, ask why, show respect" is the way we turn the philosophy of scientific empiricism into actual behavior. So, we go to observe what is happening (at the gemba, where the work takes place) while showing respect to the people involved, especially those who do the real value-creating work of the business. So now let's do a job breakdown.

Go See

It starts with "go see," so how do you go see? What do you look for?

We want to understand every gemba from the standpoints of Purpose, Process, and People. Asked most simply and directly: Is management working to align people and processes to achieve a purpose? Are processes designed to enable people to work toward achieving organizational purpose? Here are some questions to dig deeper into this:

Gemba

Gemba is the Japanese term for "actual place," often used for the shop floor or any place where value-creating work actually occurs. It is also spelled genba. Lean Thinkers use it to mean the place where value is created. Japanese companies often supplement gemba with the related term "genchi gembutsu" — essentially "go and see" — to stress the importance of empiricism.

A gemba walk is a management practice for grasping the current situation through direct observation and inquiry before taking action.

The gemba is different depending on the industry.

Industry	Example Gemba
Manufacturing	Factory floor
Hospital	Operating room
Hospitality	Kitchen, dining room
Construction	Job site
Software	Software code

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1. What is the purpose of this gemba and the broader organization? Are they aligned? Can you see that alignment in the process and the people?
2. Are processes designed consistently to achieve the purpose?
3. Are people engaged in working to achieve the purpose, and are they supported in this work by the processes?

Although purpose ostensibly comes first, I usually focus on process when walking a gemba. Still, I often begin by asking just a few simple, direct questions about purpose. What is the organization or individual trying to accomplish — objectives and problems — in general and/or today? After this, we begin our walk, observing and asking questions that focus on the process. Later, I always circle back to ask more in-depth questions about purpose, objectives, and problems.

Observing the process and people dimensions means seeking to understand the gemba (whether the specific work site you're visiting or the broader organization) as a socio-technical system. I like to try to understand the technical side first, though I observe both dimensions in parallel. If I can understand what this gemba is trying to accomplish technically, then I can easily conceive the best questions to ask to help them better understand where their real problems are and what they need to do next.

So, based on the current situation of your gemba, I can begin to consider exactly what this gemba and these people need to learn. Then, I can think of how I can help them learn it.

Ask Why

Having gone to see, now standing at the gemba, how do we go about understanding or analyzing the technical or process side of understanding the gemba-as-system? First, a thought question for you:

What did you look for last time you went to the gemba? What do you look for whenever you go to the gemba?

Here are four ways people view work through very different “lean lenses”:

1. Solution view: Look for opportunities to use lean tools.
2. Waste view: Look for waste to eliminate.
3. Problem view: Look for and resolve issues keeping you from meeting objectives.
4. Kaizen view: Look for patterns, tools, and routines, such as “kata,” to help improve work processes.

(See chart below for more detail.)

Four Ways Lean Thinkers View Work

Solution View: Look for opportunities to use lean tools.	Waste View: Look for waste to eliminate.	Problem View: Look for and resolve issues keeping you from meeting objectives.	Kaizen View: Look for patterns, tools, and routines, such as “kata,” to help improve work processes.
You must be careful here. Using a tool for the tool's sake is one of the most common reasons for the failure of lean initiatives, large or small, and once you've set this pattern, it is most difficult to overcome. Remember that lean thinking is about never jumping to conclusions or solutions, so the solution view isn't a lean view at all. But, it is prevalent among well-intentioned and even highly experienced practitioners	• Taiichi Ohno's seven major wastes: • Overproduction • Waiting • Conveyance • Processing • Inventory • Motion • Correction • (Especially overproduction) • Other Types, such as human potential	Start with the worksite objectives • Confirm: “What are you trying to achieve?” • Ask: “Why can't you?” Focus on system, quality, delivery, cost, morale • Problems: the presenting symptom or problem in performance • Causes: the issue that is creating the symptom or problem	Apply at the system level – “system kaizen” • Value-stream mapping plus material and information flow for system design Apply at the point level – “point kaizen” • Standardized work and daily kaizen

The kaizen and problem views are solidly founded on the plan-do-check-act (PDCA) process. The problem view is flexible and requires no specific lean knowledge, but it can take a long time to see results, and the path may be very uncertain. As the name implies, it is enabled by a robust problem-solving process that can take many specific forms. (See [*“Why A3 thinking is the Ideal Problem-Solving Method.”*](#))

Like the problem view, the kaizen view embodies PDCA, but it also looks to establish specific (whether new or well-understood) patterns of behaviors. These patterns — kata — lead to learning, continuous improvement, and innovation of new patterns. The concept is to “enter through form” — to master the behavior patterns and make them habitual to learn and change your thinking. Take a look at Mike Rother’s book, *Toyota Kata* (2009).

“The patterns, routines, and tools of the Toyota Production System are designed to be structures for improvement and learning.”

When observing with a kaizen view, a good approach is to start your gemba walk as close as possible to the customer and work your way back, considering “what would flow look like?” Think about the system as well as the individual processes. The patterns, routines, and tools of the Toyota Production System are designed to be structures for improvement and learning. They help us see clearly and understand and also help us teach and mentor. So, they are just the things (solutions and means of deriving solutions) we teach, the vehicles through which we can ask questions to teach and mentor.

Unfortunately, the kaizen view is sorely missing in most gemba walks I observe. And yet I am pleased that more Lean Thinkers are moving beyond the “solutions lens” (again, which is not lean thinking at all), past the simple waste lens (yes, we don’t want waste, but we need to seek understanding of why the waste is there and what we can do about the causes of the waste). And many are working are

working firmly within a problem-solving framework. This shift represents significant progress for the lean community.

Asking Questions at the Gemba

Although it is the second element of “go see, ask why, show respect,” “why?” is not the first question we want to ask at the gemba. First, ask what, then why, then what if, and finally, why not.

The purpose and process of asking why after you have observed the gemba: Your car has a GPS; you need a GTS — a “grasp the situation” — process. We must train our lean eyes to see and minds to ask what first. Asking why — to diagnose — comes later. As David Verble says, “Ask no ‘why?’ before its time.”

Show Respect

When going to see, lean thinking mandates (yes, mandates) that we show respect to all the people, especially those who do the value-creating work of the business, the activities that create value for customers. So, when visiting any gemba, through showing respect for the workers, we also show respect for customers and the company, analyzing for evidence of disconnects between stated objectives, perhaps expressed in the organization’s “true north” vision statements, versus what we observed at the gemba.

Always look for signs of disrespect toward:

1. Workers – especially muri or overburden
2. Customers – poor delivery or poor quality — especially from controllable mura or fluctuation and variation
3. The enterprise itself – found in problems and muda or waste in all its forms

But, the worker is the first and best place to look. Think of this flow:

Respect People -> Rely on People ->
Develop People -> Challenge People

We respect people because it’s the right thing to do and makes good business sense.

Think of building your operating system from the value-creating worker out. Observe the worker and steadily take

away every bit of nonvalue-creating “work.” Continue doing that, engaging the worker in the process until nothing is left except value-creating work, until all the waste has been eliminated and nonvalue-creating work isolated and taken away, distributed to support operations.

To achieve that level of “leanness,” you will find that you must engage the hearts and minds of the people doing the work. You will have to rely on them, just as you have to rely on them to come to work and do their job so you can get paid by your customers.

Once we’ve recognized that we have no choice but to rely on our employees, it is easy to see the next step, developing them. Because as the lean saying goes, “Before we make product, we make people.”

Which leads directly to the most characteristically lean dimension of respect for people: challenge. Respect for people is often mistaken for establishing the enlightened modern democratic workplace in which everyone is treated with great deference and politically correct politeness. Yet, respect demands that we challenge each other to be the best we can be. Setting challenging expectations is one of the most critical skills of lean leadership.

Most of all, respect means doing what we can to make things better for workers, which starts by not making things worse. And we still find leaders doing more of their share of damage even as they try to help! That’s why the first rule of gemba walking is: “Do no harm!”

A Note on Gemba-Based Leadership

Everywhere we go, we still find overwhelming evidence that the conventional view of a leader is as an answer man (or woman) — that the leader always should have a ready answer and that the leader’s answer is always correct — remains strong. And indeed, the leader’s role in providing the vision, setting the direction, and showing the path to true north is foundational to lean success.

Unfortunately, we also see overwhelming evidence of the damage done by the broadcast of executive answers that reverberate negatively throughout the organization.

These guidelines are my own, based on doing gemba visits as an invited outside observer. Each of us needs to consider first, depending on where you work in your organization, where is your real gemba? It’s easy for leaders to cause more trouble than they alleviate. CEOs who try to directly eliminate waste at the gemba often generate more waste than they prevent!

Here are two simple sets of questions for you:

We already asked: “What did you look for the last time you went to the gemba?” “What do you look for (generally) when you go to the gemba?”

Then ask, “What did you do?”

After that, the next set of questions is:

- What will you look for next time you go to the gemba?
- What will you look for (generally) when you go to the gemba?
- What will you do?

In other words, ask: What will you do to help?

“Whenever leaders issue prescriptions from afar, bad things are likely to happen.”

Whenever leaders issue prescriptions from afar, bad things are likely to happen. The best antidote we know? Confirm what is happening as it is happening. Diagnose and prescribe as close in time and place as possible to the work, preferably in partnership with the person or people doing the work. That is one of lean management’s most vital principles and practices. ■

Getting Started with Lean Thinking and Practice

The answer to the novice Lean Thinkers' most common question might surprise you.

By James (Jim) Womack, PhD



To help leaders and managers begin their lean journey, LEI founder Jim Womack explains the fundamentals of lean thinking and practice and offers practical advice in this animated video. Find a transcript below.

[Watch the video by clicking image above or at lean.org/whatislean](https://lean.org/whatislean)

“Where do you start? Lean is not a grand theory but a set of standard practices developed for your organization based on experiments. So start somewhere with a value-creating process — what we call a value stream or a model line — to learn what works best for you.

An A3 is the best way to create your hypothesis about how to make things better. [In an A3 process], you determine the current state. You identify the business problem (or opportunity) and the root cause. You measure the performance gap. You inventory the potential countermeasures. You select the most promising countermeasure, and you conduct the plan-do-check-act (PDCA) process. That's science. That's management by science.

Now, with regard to where to start, everyone wants to start with the CEO. “If my CEO would just do this, everything would be great.” That's great — if they will. And many want to start with education in lean thinking and/or benchmarking. But, you're probably not the CEO, and education and benchmarking produce no benefit without action, which is to say, without experiments.

Number one, start where you are, whether you're the CEO, the COO, the CFO, the CIO, a business unit head, a department head, a facility manager, an area leader within the facility, product-line manager. Start where you are. Note that I've not listed the heads of the operational excellence or continuous improvement programs.

We've learned that lean transformation must be led by line managers. So, the job of the continuous improvement or Op-Ex department is to coach line managers on how to run experiments and to provide technical assistance as necessary.

**“Lean is not a program;
it is not time-limited;
it has no end.”**

Point two — point one, start where you are — point two, start with experiments. They can provide more value for customers by eliminating waste and creating success. Start with something important.

To sum up, whoever you are, and wherever you start, pick a value-creating process, not just spread all over the place, but

Yokoten

A Japanese term for deploying concepts, ideas, or policies horizontally across the company.

For example, imagine a defective valve is found on one machine in the plant. Yokoten would be the process to ensure that all similar valves in the facility and other relevant facilities are examined for the same defect as well.

from the *Lean Lexicon 5th Edition*

pick a value stream. Create an A3. Run experiments. Reflect on what you've learned. Share your findings with the rest of your organization. We call that yokoten — the horizontal or vertical spread of good ideas — and keep experimenting. Lean is not a program; it is not time-limited; it has no end.” ■

A3 Report

An A3 Report is a Toyota-pioneered practice of getting the problem, the analysis, the corrective actions, and the action plan down on a single sheet of large (A3) paper, often with the use of graphics. At Toyota, A3 reports have evolved into a standard method for summarizing problem-solving exercises, status reports, and planning exercises like value-stream mapping.

But it is much more than a sheet a paper with facts and figures. It is a management process learned through dialogue about concrete problems. It does this by means of a dialogue between a lean manager and a subordinate who learns lean management and leadership as she solves an important problem.

This process of solving problems while creating better employees — A3 analysis — is core to the Toyota management system. An A3 report guides the dialogue and analysis. It identifies the current situation, the nature of the issue, the range of possible counter- measures, the best countermeasure, the means (who will do what when) to put it into practice, and the evidence that the issue has actually been addressed.

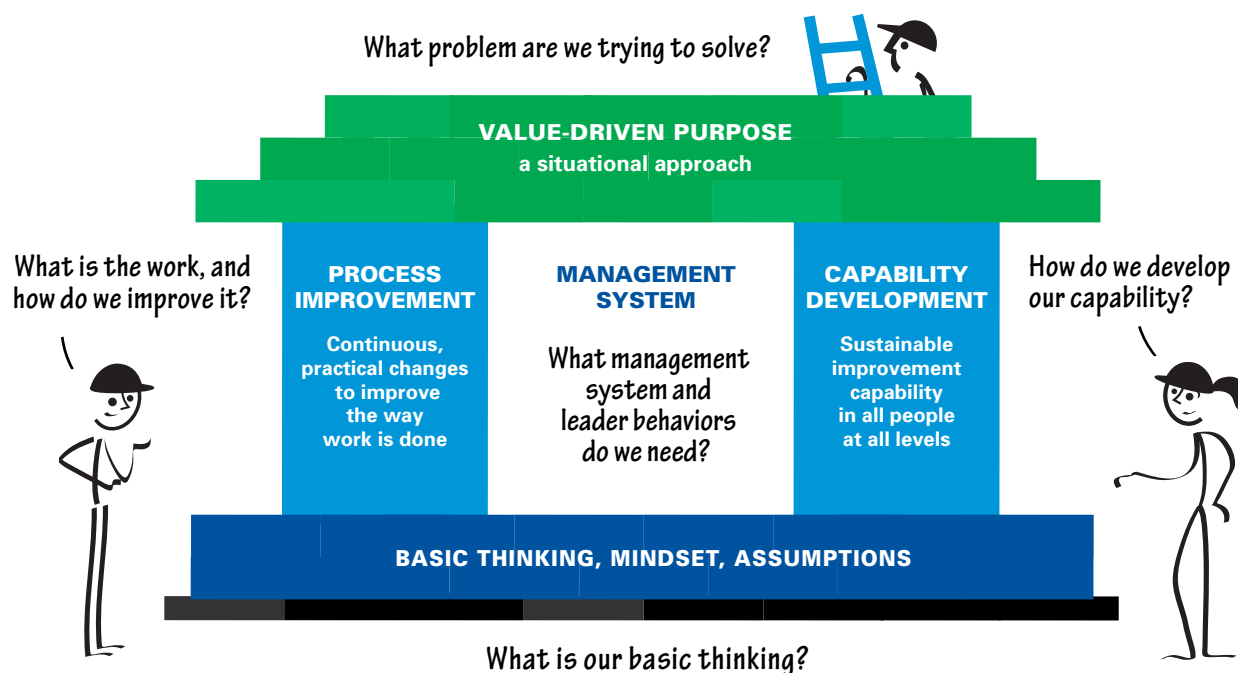
Title: What change or improvement are you talking about?		Owner/Date
1. Background: What are you talking about and why? What is the purpose, the business reason for choosing this issue? What specific performance measure needs to be improved? What is the strategic, operational, historical, or organizational context of the situation?	2. Current Conditions: Where do things stand now? What is the problem or need—the gap in performance? What is happening now versus what you want or needs to be happening? Have you been to the gemba? What facts or data indicate there is a problem? What specific conditions indicate that you have a problem or need? Where and how much? Can you break the problem into smaller pieces? → Show facts and processes visually using charts, graphs, maps, etc.	5. Recommendations: What do you propose and why? What are the options for addressing the gaps and improving performance in the current situation? → Always start with two or three alternatives to evaluate. How do they compare in effectiveness, feasibility, and potential disruption? What are their relative costs and benefits? Which do you recommend and why? → Show how your proposed actions will address the specific causes of the gaps or constraints you identified in your analysis. The link should be clear and explicit!
3. Goal: What specific outcome is required? What specific improvement(s) in performance do you need to achieve? → Show visually how much, by when, and with what impact. → Don't state a countermeasure as a goal!	4. Analysis: Why does the problem or need exist? What do the specifics of the issues in work processes (location, patterns, trends, factors) indicate about why the performance gap or need exists? What conditions or occurrences are preventing you from achieving the goals? Why do they exist? What is (are) their cause(s)? → Use the simplest problem-analysis tool that will suffice to show cause-and-effect down to root cause. From 5 Whys to 7 Q2 tools (fishbones, analysis trees, Pareto charts) to more sophisticated SPC, 6 Sigma, and other tools as needed. → Test the cause-and-effect logic by asking "why?" downward and stating "therefore" upward.	6. Plan: How will you implement? (4Ws, 1H) What will be the main actions and outcomes in the implementation process and in what sequence? What support and resources will be required? Who will be responsible for what, when, and how much? How will you measure effectiveness? When will progress be reviewed and by whom? → Use a Gantt chart (or similar diagram) to display actions, steps, outcomes, timelines, and roles.
7. Follow-up: How will you ensure ongoing PDCA? How and when will you know if plans have been followed and the actions have had the impact planned and needed? How will you know if you meet your targets? How will you know if you reduced the gap in performance? What related issues or unintended consequences do you anticipate? What contingencies can you anticipate? What processes will you use to enable, assure, and sustain success? How will you share your learnings with other areas?		

from the *Lean Lexicon 5th Edition*

Transforming Your Organization with Lean Thinking and Practices

A proven, systematic approach to resolving problems at every organizational level spurs fundamental change that can help create great workplaces and improve business outcomes.

By John Shook



At the Lean Enterprise Institute, we think a lot about change. We think a lot about enterprise transformation. Every day all day, each of us aspires to create desired change. That's what work is all about.

Enterprise transformation, then, is change on the enterprise level.

We've learned a lot over the years. But, most critically, we have learned that effective enterprise transformation requires change — innovative improvement — on five dimensions. That is a bold assertion: not four, not six, but five dimensions. And lean thinking has a point of view about each of those five dimensions.

We'll not delve deeply into what those points of view are right now. Instead, we will explore the essential matter

of how to think about enterprise change through the illustration of a house. The metaphor of a house has been around lean thinking for a long time, so we'll use that for convenience.

Determining Your Value-Driven Purpose

Let's start with the roof to explore it. Any good house has to have a roof to protect us from the rain, sleet, and maybe excessive sunshine — if there could be such a thing. At the top of this house, we have our objectives — our goals, our aspirations. In other words, we're going to ask: What is our value-driven purpose — why are we here — as a company, as an enterprise? It may be we would think we're here just to generate money. That would take us down a certain path, in which case I may care less about creating customer value and may care just about profit.

Lean thinking drives us to think about what value we create for customers, society, and employees. So, what is our value-driven purpose?

Since it (lean thinking) starts with a question like that, our approach to effective transformation should be situational. It's a situational approach determined by first asking the question: What is our value-driven purpose? More specifically, each individual in your organization needs to be able to ask and answer the question: What problem am I here to solve? What problems are we each trying to solve?

Value

The inherent worth of a product from the customer's perspective, as reflected in its selling price and market demand.

The producer typically creates value in a product through a combination of actions, some of which produce value as perceived by the customers and some of which are merely necessary given the current configuration of the design and production process. The objective of lean thinking is to eliminate the latter class of activities while preserving or enhancing the first set.

Value-Creating: Any activity that the customer judges of value. A simple test as to whether a task and its time is value-creating is to ask if the customer would judge a product less valuable if this task could be left out without affecting the product. For example, rework and queue time are unlikely to be judged of any value by customers, while actual design and fabrication steps are.

Nonvalue-Creating: Any activity that adds cost but no value to the product or service as seen through the eyes of the customer.

from the *Lean Lexicon 5th Edition*

Identifying the Work to be Done and Processes to Improve

The next question to ask is What is the work to be done? What is the work?

Any house has to have walls, or pillars, to hold up the roof. This first pillar represents the work to be done. We call it

Process: What is the process, or the work, by which we will accomplish our purpose?

If our purpose is to create videos, we have to know how to get a video camera, then set it up so that we have the proper lights and can get the work done. Then, as we gain experience, we will doubtless find that there are problems in the work process — that the work needs to be improved. So, we need some means by which we go about process improvement.

Improving the work to be done — always starting with the work — begins with the question: What is the work to be done? So now that I've identified the work that's going to solve the problem to deliver the value we're here to provide, that's the first pillar to hold up the roof.

Specifying the Capabilities that are Needed

The roof will not be held up by only one pillar; we have to have another. And we're going to call this one Capability. This pillar is understood by asking: What capabilities do we need to do the work — to solve the problem and fulfill our purpose?

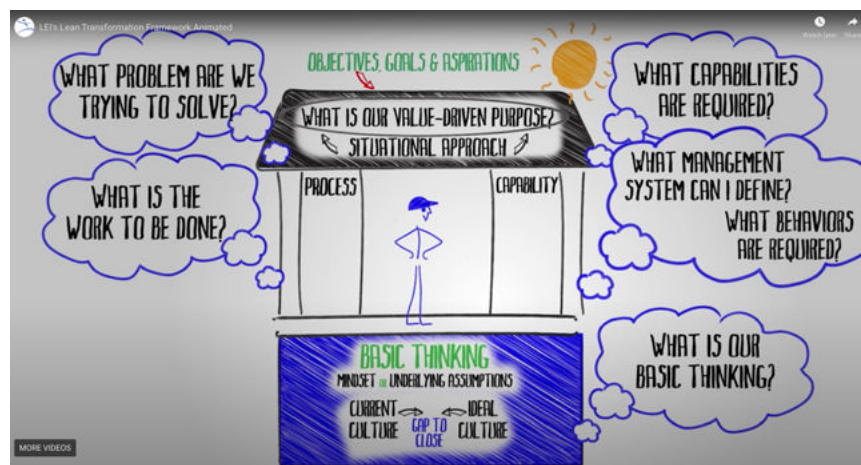
Capability-building thus comprises the other pillar, the second pillar. So, with these two pillars, I now have something holding up my roof, making it look like a house.

Creating the Management System

But any house is only a house until it's a home. It becomes a home by the behavior of the people living in it. The people are inside, not outside, and so are protected and comforted by the house and the dynamic that brings the place to life — to make it into a home. And there are two aspects of that we to consider.

The first is the management system that I can define that will support the development of building capabilities to do the work to fulfill the purpose. And the second is the behaviors and soft skills required of leaders and everyone for us to be able to work effectively.

In this management system (to build the capability to do the work to fulfill the purpose), we need to define those soft skills and those behaviors. For example, how might I respond as a leader when one of my employees or one of



This brief animated video is a guide to the five fundamental questions that help lean practitioners understand the nature of — and execute — a lean transformation.

[Watch the video by clicking image above or at lean.org/LTF](http://lean.org/LTF)

my team members has a problem or has made a mistake? Do I get angry? Do I throw things? Or do I seek to understand why, so I can help remove the barriers to that employee's success?

The management system, then, is something I can define just as I define a mechanical device. Let's say, for example, that we'll meet every morning in a huddle at 8 o'clock. And then, we'll meet again before lunch to see how the day has gone so far. We'll have weekly meetings to assess and determine our plans for the week. We'll meet monthly to see how we're doing against our annual plan and annually to develop a plan that will take our organization further toward achieving our defined purpose. So the management system can be defined. The management system and the behaviors — the leader behaviors and the teamwork behaviors — of everyone are those soft skills that fit in and bring this overall system to life.

Developing Our Basic Thinking

One more dimension to our enterprise transformation model is underneath all of this. Basic thinking, or mindset or underlying assumptions, informs everything we do — informs all of our activities as we attempt to achieve our purpose.

Basic thinking and some other words I'll use interchangeably here — mindset, underlying assumptions, beliefs — can be of two types: Explicit assumptions that we articulate

and hidden underlying assumptions that we are unaware of on a moment-to-moment basis. These underlying beliefs comprise our current culture as it exists today, which we can change to achieve the ideal culture to which we aspire. Understanding our current and aspirational culture will give us a gap to close, just as we can identify gaps in other parts of our enterprise performance as we solve problems day to day.

Moving Forward Situationally

So all together, these are things we need to address. And around each of these, I can ask some simple questions: What problem are we trying to solve? What purpose are we trying to achieve? What is the work to be done, and how will I go about improving it? What capabilities are required, and how will I grow them? What management system can I define, and what behaviors are needed to build the capabilities to do the work to solve the problem that we're here to solve? And underneath it all is the matter of addressing: What is our basic thinking? What do we currently think, for example, about cause and effect? How is that thinking currently comprised in our culture, and how does that affect the culture we want to create?

Addressing these dimensions leads us toward effective enterprise transformation. If we leave any out, we'll fail. So the Lean Transformation Framework is a situational approach because there is no perfect ten-step program that leads to the perfect lean transformation. Each situation is unique and demands its own customized set of countermeasures.

With the questions on the five dimensions, however, we each can map out our own personal or organizational transformation, one that solves our specific situational problems to achieve our unique purpose.

Good luck on your journey.

[Learn more about the Lean Transformation Framework.](http://lean.org/LTF)



About The Lean Enterprise Institute

The Lean Enterprise Institute, Inc, was founded in 1997 by management expert James P. Womack, PhD, as a nonprofit research, education, publishing, and conferencing company. As part of its mission to advance lean thinking around the world, LEI supports the Lean Global Network (leanglobal.org), the Lean Education Academic Network (teachinglean.org), and the Healthcare Value Network (healthcarevalueleaders.org).

Continue Your Learning

The Lean Enterprise Institute (LEI) offers a wide range of learning resources, all with the practical knowledge you need to sustain a lean transformation:

Learning Materials

Our plain-language books, workbooks, leadership guides, and training materials reflect the essence of lean thinking — doing. They draw on years of research and real-world experiences from lean transformations in manufacturing and service organizations to provide tools that you can put to work immediately.

Education

Faculty members with extensive implementation experience teach you actual applications with the case studies, worksheets, formulas, and methodologies you need for implementation. Select from courses that address technical topics, culture change, coaching, senior management's roles, and much more.

Events

Every March, the Lean Summit explores the latest lean concepts and case studies, presented by executives and implementers. Other events focus on an issue or industry, such as starting a lean transformation or implementing lean in healthcare. Check lean.org for details and to get first notice of these limited-attendance events.

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A quick and secure sign-up delivers these online learning resources:

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