



Understanding Lean Transformation

Table of Contents

Introduction: What is the Lean Transformation Framework?	2
People-First Leadership: A Conversation Between Jim Morgan and Alan Mulally	7
Lead from the Front, Lead from Behind	8
Becoming Horizontal in a Vertical World	10
Respect for People: Making Jobs Easier for Workers.....	12

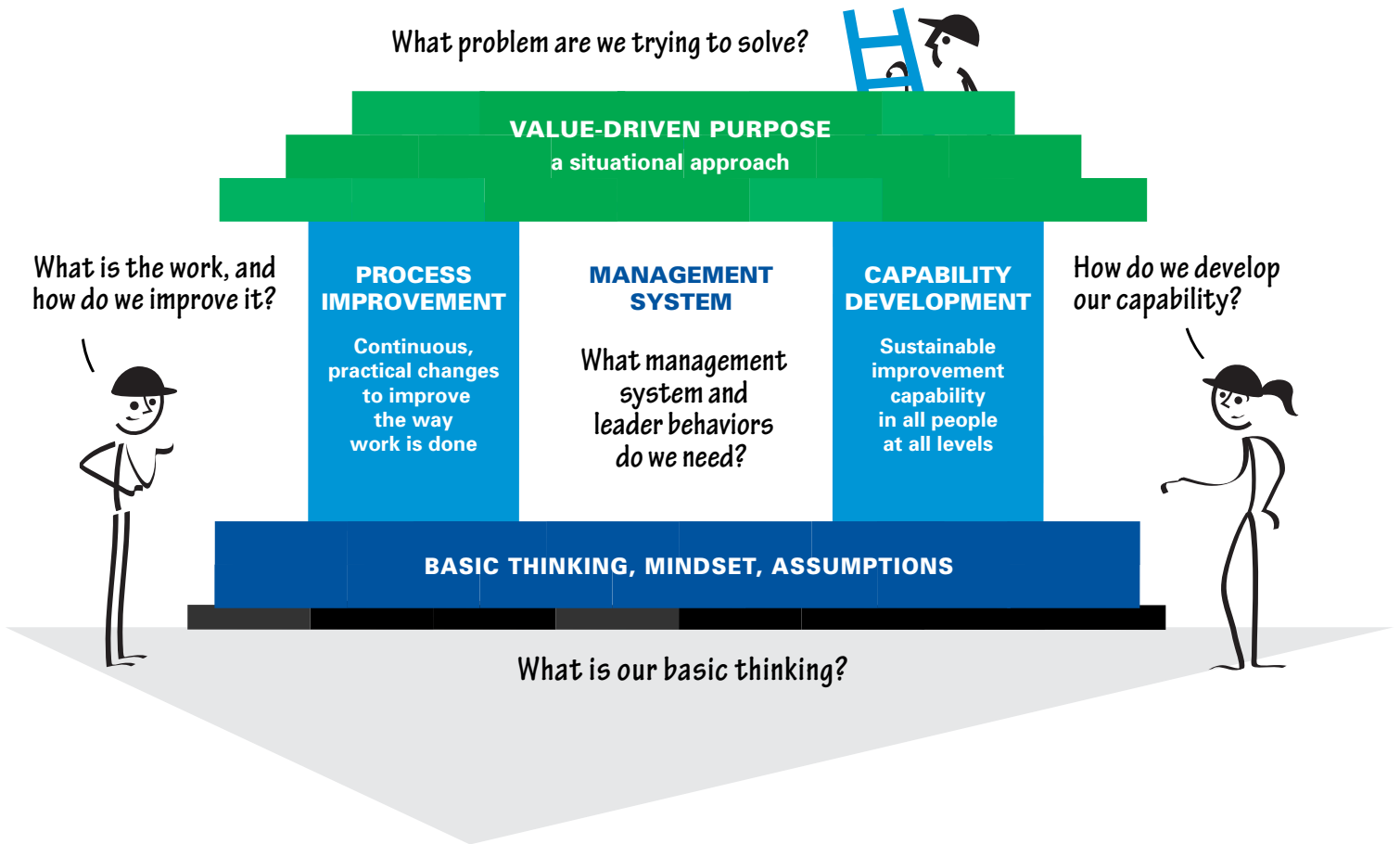
Introduction

What does it take to undergo a lean transformation? It is more than a collection of tools – lean transformation is a paradigm shift that aligns purpose, process, and people, leading to extraordinary business performance and better jobs for workers. This ebook, “Understanding Lean Transformation,” explores what it takes to transform your enterprise and provides inspirational examples to learn from.

The ebook will teach you about the Lean Transformation Framework (LTF), a powerful tool that helps you align purpose, process, and people. It will also ground you in five key questions you can ask at any enterprise level to assess gaps in your transformation effort.

There are two examples of lean leadership, one from the frontline and another from the top. You’ll also read a real-world case study that demonstrates lean principles in action.

Prepare to reflect on the Lean Transformation Framework, scrutinize your management, and begin to construct a transformation roadmap.



What is the Lean Transformation Framework?

The Lean Transformation Framework is a proven, systematic approach to resolving problems at every level of the enterprise, from executive-level strategy to frontline operations. Whether you lead an established organization or a startup, you can use the Framework to address any troubling issue by answering its five questions.

The questions guide you through the fundamental questions of purpose, process, and people, which will help you to identify solutions that align with all three.

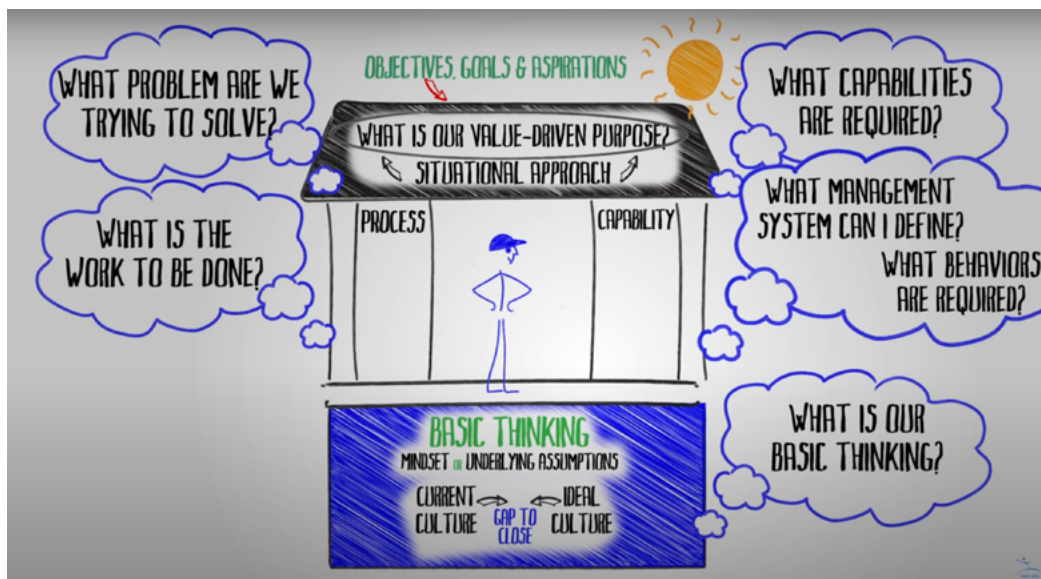
After decades of practical, hands-on lean practice, lean practitioners now understand that the best way to learn about lean transformation is by improving some element of a work process. Moreover, the lean community discovered that this improvement process requires asking the questions that LEI incorporated into the Lean Transformation Framework.

They are as follows:

1. What is the value-driven purpose? Or what is the problem to solve?
2. What is the work to be done (to solve the problem)?
3. What capabilities are required (to do the work to solve the problem)?
4. What management system — operating system and leadership behaviors — is required?
5. What basic thinking, including mindsets and assumptions, are required by the organization as a purpose-driven socio-technical system?

These questions are fractal — meaning that the same questions apply whether working at the macro enterprise level or the level of individual responsibility. So, anyone at any level of enterprise — from the CEO to the frontline supervisor — can use the Framework.

When using the Framework, it's vital to understand how each question — and answer — relates to the others to maintain momentum toward achieving transformation.



Watch the video at lean.org/LTF

Lean Transformation Framework Questions

1. What problem are we trying to solve?

This question clarifies whether you've clearly defined your organization's True North or value-driven purpose. If you make headphones, for example, have you specified your value proposition from your customer's viewpoint in terms of quality, cost, and lead time?

Then, what is your current situation versus that target? For example, if you make custom headphones to order and it takes one month to deliver, but your customers expect delivery in two weeks, that gap becomes your problem to solve.

2. What is the work, and how do we improve it?

Based on a quarter century of practical experience, LEI believes organizations must focus on improving the frontline work to resolve business problems and, ultimately, achieve their organizational purpose. So to solve the business problem clarified in Question 1, the Framework calls for closely analyzing, describing, and breaking down the work process to determine how to improve it.

In the headphones example, you'd go to the gemba, where the work of producing the headphones occurs, to study the work and ask: What, in the work process itself, is preventing us from achieving our objective of a two-week lead time? Is it design? Production? Logistics? Something supplier-related? Of course, you'd use lean practices and tools proven to help answer these questions, such as value-stream mapping, standardized work, A3 problem-solving, and others.

3. How do we develop our capability?

Once we clarify the problem to be solved and the work-process improvements that will resolve it, we often find that we cannot make the necessary changes with our current capabilities. Continuing with our example, we may require new design, production, or logistics capabilities to improve the lead time to deliver our headphones in two weeks.

Furthermore, a natural part of a lean transformation is developing the capability to transform. Across the organization, how capable of solving problems and continuously improving is each individual? Have we specified the skills we need and a plan to help everyone develop them?

4. What management system and leader behaviors do we need?

As we develop our people's capability of improving their work processes, we will encounter problems in the management system. Discovering this is a natural by-product of this type of development. Issues with the management system often relate to how the organization is structured or leadership practices and behaviors.

For example, if we want everyone to be capable problem solvers, what organizational structure is needed to build this competence? How do leaders at every level connect to the day-to-day work at the gemba? How does communication and review of the work occur daily, weekly, monthly, or annually to confirm we are achieving our objectives and to allow management to step in and offer support as needed? And what leadership behaviors are necessary to ensure that problems are quickly surfaced and resolved?

5. What is our basic thinking?

The final Framework question helps identify the fundamental thinking or mindset behind our lean transformation. While the example we've laid out may seem straightforward, it's clear that one of our basic assumptions in taking lead time from four weeks to two is that, as a business, we will first and foremost focus our work on fulfilling the customer's needs. And if you follow that same logic through our set of questions, you'll see that another part of our basic thinking is that we will focus on increasing the value-added work.

Also, we will show respect for the people doing the work by ensuring that every step of their work process adds value for the customer. So, as these few examples show, the answer to Question 5 becomes clear as we work through the transformation process by improving the work.

Lean Transformation Framework Questions

1. What problem are we trying to solve?

This question clarifies whether you've clearly defined your organization's True North or value-driven purpose. If you make headphones, for example, have you specified your value proposition from your customer's viewpoint in terms of quality, cost, and lead time?

Then, what is your current situation versus that target? For example, if you make custom headphones to order and it takes one month to deliver, but your customers expect delivery in two weeks, that gap becomes your problem to solve.

2. What is the work, and how do we improve it?

Based on a quarter century of practical experience, LEI believes organizations must focus on improving the frontline work to resolve business problems and, ultimately, achieve their organizational purpose. So to solve the business problem clarified in Question 1, the Framework calls for closely analyzing, describing, and breaking down the work process to determine how to improve it.

In the headphones example, you'd go to the gemba, where the work of producing the headphones occurs, to study the work and ask: What, in the work process itself, is preventing us from achieving our objective of a two-week lead time? Is it design? Production? Logistics? Something supplier-related? Of course, you'd use lean practices and tools proven to help answer these questions, such as value-stream mapping, standardized work, A3 problem-solving, and others.

3. How do we develop our capability?

Once we clarify the problem to be solved and the work-process improvements that will resolve it, we often find that we cannot make the necessary changes with our current capabilities. Continuing with our example, we may require new design, production, or logistics capabilities to improve the lead time to deliver our headphones in two weeks.

Furthermore, a natural part of a lean transformation is developing the capability to transform. Across the organization, how capable of solving problems and continuously improving is each individual? Have we specified the skills we need and a plan to help everyone develop them?

4. What management system and leader behaviors do we need?

As we develop our people's capability of improving their work processes, we will encounter problems in the management system. Discovering this is a natural by-product of this type of development. Issues with the management system often relate to how the organization is structured or leadership practices and behaviors.

For example, if we want everyone to be capable problem solvers, what organizational structure is needed to build this competence? How do leaders at every level connect to the day-to-day work at the gemba? How does communication and review of the work occur daily, weekly, monthly, or annually to confirm we are achieving our objectives and to allow management to step in and offer support as needed? And what leadership behaviors are necessary to ensure that problems are quickly surfaced and resolved?

5. What is our basic thinking?

The final Framework question helps identify the fundamental thinking or mindset behind our lean transformation. While the example we've laid out may seem straightforward, it's clear that one of our basic assumptions in taking lead time from four weeks to two is that, as a business, we will first and foremost focus our work on fulfilling the customer's needs. And if you follow that same logic through our set of questions, you'll see that another part of our basic thinking is that we will focus on increasing the value-added work.

Also, we will show respect for the people doing the work by ensuring that every step of their work process adds value for the customer. So, as these few examples show, the answer to Question 5 becomes clear as we work through the transformation process by improving the work.

What is your current situation?	What is your specific target condition to achieve in the next year?	What are your next steps?

People-First Leadership: A Conversation Between Jim Morgan and Alan Mulally

By Jim Morgan

I was starting to think that I had made a huge mistake. I had been at Ford for a little more than a year and while my work with Mazda and others in creating a new global development process was both rewarding and exciting, I knew there was so much more to do, and the toxic culture I was experiencing in my new role as an engineering director made me doubt that we could ever get there. My friends and colleagues from the lean community outside of Ford reinforced this view based on their previous work with the company. “Hopeless” was a term I heard most often and the numbers seemed to support their view. (The company was about to lose \$17B.) Ford had just hired some “airplane guy” as CEO but I figured that just meant additional rounds of cost cutting. In any case, whatever he did would likely be too little too late. But I had made a commitment and I resolved to do my best and see it through.

And that’s when I saw it. Buried in my daily stack of mail was a hand written note from the new President and CEO, Alan Mulally (AKA “airplane guy”) asking me if I could find time to stop by his office to talk. I would find out later that this invitation was due to an email Jim Womack had sent Alan and part of Alan’s effort to deeply understand the current state at Ford. But I

knew none of that at the time and was fairly suspicious of the note. Perhaps the cost cutting was about to start. Instead, that meeting led to a life changing adventure and a treasured mentor and friend who I continue to learn from to this day. But more relevant to this podcast, it was my introduction to the guy who would lead one of the most dramatic turnarounds in recent business history.

Alan Mulally is a brilliant engineer who was a major part of creating nearly every airplane in Boeing’s fleet. He led the total development of the game changing 777 airplane and then went on to lead historic transformations as CEO of Boeing Commercial and then Ford Motor Company. But just as important as what he accomplished, is how he accomplished it. His people first, inclusive approach to leadership not only created great products and successful companies, but also created an organization people (from the plant floor to senior leaders to UAW Leadership) wanted to be a part of.

In this podcast, Alan shares:

- His view on the CEO’s role in a successful transformation.
- What “people first” leadership means to him and how his basic values and love for people guide his decision making
- What he learned about innovation and customer focus from his lawn mowing business.
- How his early experiences with Lean and Toyota shaped his views on leadership and the importance of an effective management system.



Listen to the full podcast at lean.org/PeopleFirst

- How he has continuously improved and evolved his management system over forty years starting with aircraft development, to the transformation of global organizations and how it influences his work with Google, The Mayo Clinic and Carbon 3D today.

The Working Together Management System

- Alan takes the time to share the key attributes of his management system, including its basic principles of inclusion, transparency, accountability, be data driven, and have fun – but never at anyone else’s expense.
- He also describes its three foundational elements: compelling vision, aligned plan, and relentless execution through an effective operating system.
- He explains how “trusting the process” builds successful and sustainable organizations where people really want to work and creates accountability without all the energy sapping drama.
- How it minimizes firefighting, enabling you to create products with speed, precision, and quality that your customers actually love.

Throughout our conversation, he shared stories from the products he developed and transformations he led. Providing valuable insight for leaders like you who are trying to navigate today’s disruptive and turbulent environment. ■

Lead from the Front, Lead from Behind

By John Shook

Leadership Again

When you see good leadership, follow it if you wish.

If you don’t see it, take it. If you wish.

If you don’t, don’t complain.

In my last letter I alluded to a common view in the Lean Community – shared by the broader business community at large – that promotes the notion of the heroic leader, riding a stallion into a troubled situation issuing directives and saving the day. “The leader must lead” the dictum goes. Well, yes, the leader must lead. But, what does that mean?

I am growing ever more leery of cries for “strong leadership” of the hero variety with the leader exercising command and control, telling the troops what to do. This view not only misses the point, it obscures the real issue. The issue isn’t “leadership” at all; it’s what leadership accomplishes. As long as any system is dependent on “leadership” it is fragile and dependent – literally – on the individual who happens to be in charge today. Fans of charismatic or forceful leadership squirm at this message. But over time I have come to think that the real issue is learning to build systems

that accomplish the things we advocate (problem solving culture, individuals engaged in continuous improvement, etc.).

Lean practice represents a fundamentally different type of leadership. Lean leadership is highly situational in practice, yet consistent in underlying principle; flexible and adaptive in situation-based action, yet solidly rooted in an unwavering way of thinking. There are occasions that call for more directive leadership behavior and those that call for patient consensus building, always in pursuit of attaining organizational purpose. But, lean thinking in practice calls for more than just leadership that sways with the situation of the moment. Close examination reveals a few common denominators. Observable behaviors include demonstrations of respect for people, rigorous application of scientific thinking, and flexible application of practices to solve problems and continuously improve processes. Observable behaviors – things we can see; things we can choose to do.

Most important of all, lean leadership isn't a matter of position, it's a matter of action. Action that can be taken at any level, in any situation, and the leadership can work down, up, or sideways.

(For a look at what those behaviors are, read lean.org/LeadershipLesson)

Leading Up at NUMMI

Here's another example from that organization I often use for illustration, the joint venture between Toyota and General Motors: New United Motor Manufacturing, Inc. (NUMMI).

One advantage NUMMI (and many other transplant companies of the 1980s) enjoyed was a substantial allocation of resources from the headquarters (the home culture) to kick-start the creation of a local, hybrid culture in North America. In the first year or so, Toyota dispatched about 400 "trainers", technical specialists, to NUMMI on rotating three-month assignments.

Group Leader Hyodo was assigned to support a model changeover in assembly. Hyodo graduated from a technical high school and started working as an assembly line worker for Toyota's Takaoka Assembly plant when he was about 18 years old. After ten years, Hyodo was promoted to Team Leader along with most of his colleagues that entered at the same time. Five years later, he was promoted to Group Leader, in charge of a group of less than 30 team members and leaders. At NUMMI, he was responsible for supporting the work of a larger group and, now, facilitating the learning required to achieve a successful launch.

As leader of the final assembly launch team, Hyodo was developing the skills of his team members while working to ensure the best possible design of jobs for the workers who would perform the work on the assembly line. The work needed to be designed so that it developed people as they carried it out – an ambitious target condition and a challenge to develop job designers with that skill!

His launch team was learning to build dollies and fixtures, to design efficient standardized work, to balance and rebalance jobs while eliminating waste, ergonomic concerns and other problems. He wasn't just designing good jobs, he was building good job designers and problem-solvers. The immediate problems that Hyodo was focused on were problem-solving capability itself, along with job design skills. NUMMI had initiated some training to enhance standardized work design and problem-solving skills, but Hyodo saw that the training was too removed from the gemba.

Hyodo recognized the good intentions of the training being offered by the HR department but also knew that developing excellent job design skills requires – more than anything – deep understanding of the work itself and how the actual work impacts each individual on the assembly line. As his team did its work, Hyodo found many of his team's ideas being rejected, sometimes by senior managers in HR, sometimes by senior production managers. Hyodo concluded that

the HR and production organizations were misaligned. His solution? Arrange for HR representatives to be assigned full time to his launch team. This was a smart move on the surface – he would get alignment and learning at the front lines of the organization.

If it was a smart move on the surface, it was a brilliant move when examined more deeply. From the very fact that neither the HR nor the production organizations were in favor of the proposal, Hyodo knew that the matter would have to escalate to the highest levels. And therein lay his real objective: he was intentionally causing highest levels of the organization to talk to each other about the problem.

So, he pushed his ideas. Hyodo pushed his ideas because he wanted to instigate conflict at the lowest levels of the organization precisely because he knew that it would force the highest levels (vice presidents) to work together for the betterment of the overall company.

Hyodo knew the poison of high-level corporate systems operating independently of the real world gemba reality. So he decided to deliberately drive issues on the floor with the specific intent of creating conflict to force high-level cross-functional dialogue and progress.

Wow.

A high-school educated shop-floor rat (a union member, by the way) intentionally introducing technical change on the plant floor in order to disturb the social system at the broader level.

That's lean leadership.

Doesn't sound like a typical illustration of the kind of leadership practices that many companies are trying to establish. But, that's what it looks like eventually. Front-line value creators not just being led but leading. (For a deeper dive into Hyodo's story and a look into how it relates to "hoshin kanri" [click here.](#))

So, that's what those opening words mean. Don't look outside yourself for leadership. Take it. ■

Becoming Horizontal in a Vertical World

By Jim Womack

One of my favorite value-stream walks is with the senior managers of several organizations who share and jointly manage a value-creating process that stretches all the way from raw materials to the end customer. I've been taking walks of this sort for more than 20 years and I usually see the same thing: Smart, hardworking managers, each trying to optimize their portion of the value stream and wondering why there is so much inventory, interruption, and waste along the stream and why it is so hard to truly satisfy the customer waiting at the end.

This is what I usually see because we live in a world where everything is oriented vertically – departments, functions, enterprises, and, very important, individuals – despite the fact that the flow of value to the customer is horizontal across all the departments, functions, and enterprises. And – here's the really odd part — every manager and employee touching the value stream knows intuitively, just below the surface, that value flows horizontally and that customers have no interest at all in the vertical constraints interrupting the flow.

So what's the problem? Why is it so hard for us to act horizontally rather than just work around (or simply ignore) the enormous problems of being vertical?

I hate to say, but the problem begins with you and me. We are all points along the stream, standing tall in our own estimation, and our first objective is to optimize ourselves, our own point! Given this, it's not surprising that we first seek to optimize our department (where

our boss, our personnel evaluation, and our career path reside) and then our function and then, maybe, our enterprise, with no energy left over for optimizing the whole stream.

But let's not be too hard on ourselves. Our personal objectives, compensation and career trajectories strongly direct us to look up, for fear of falling down, rather to look from side to side in hopes of doing better. We aren't so much bad people – at least I'm not! – but good people working in a bad management process. However, unless we can devise a new framework for thinking together about the horizontal flow of value in a way that makes everyone better off, we will all continue to act as we always have. The predictable result is frustrating work lives and an exasperating experience for customers.

How can we do better? The first step is simple. Take a walk together along the stream to see, and to reach agreement on, what is really happening and the problems the current state causes managers, employees, and customers. Then draw a map that everyone touching the stream can see and post this as the baseline. This step always produces amazement and then relief that all of the dysfunctions and conflicts are finally out in the open.

Next, assign someone to lead a team involving every function and firm touching the value stream to envision a value-creating process that better solves customer problems while saving time and money. Then ask why this can't be created and seek the root cause. Part of the problem may be technical and some outside help may be needed when skills are lacking. But in my experience the critical problems are more likely to be organizational across multiple functions and enterprises. For example, money may need to be spent at one point (for facilities, equipment, training, new

packaging of goods, etc.) and behaviors may need to change at this or other points to create a better result for the whole stream.

But why would the managers of the factory or the warehouse or the retailer do this when all of the benefit goes to one or a few points elsewhere along the stream? And why would employees cooperate in rethinking work when they may individually have more work or no work at all? The answer, of course, is that they won't and everyone involved will spend their time instead on explanations of why the failure to improve performance is everyone else's fault. A classic prisoner's dilemma in which everyone gets to stay in their vertical jail!

So the job of the value-stream leader – who it should be noted has no authority over most and perhaps all of the departments and firms involved – is to take responsibility for the performance of the whole value stream and discover ways to make everyone along the stream whole as the stream is improved. In the end the senior leaders of all the departments, functions, and firms will need to agree with the plan, arrange compensation mechanisms for those who would otherwise be losers, and make sure that everyone touching the stream has incentives aligned with the goal of optimizing the stream. But the first step is to raise consciousness, create the vision, highlight the problems to be overcome, identify the costs of improvement along with the benefits of success, and describe the ways to offset costs with benefits to achieve a positive sum solution. Without this first step, starting with a simple walk together, we will all continue along our vertical path, where value stream performance is a stagnant, horizontal line. ■

Respect for People: Making Jobs Easier for Workers

By David Drickhamer

Turner Construction Company is the largest general builder in the United States, with over 10,000 direct employees and an annual construction volume of \$15 billion. Turner has regional offices across the country and internationally.

The Lean Enterprise Institute has been working with Turner since 2017 to help the firm more deeply embed lean practices and a lean mindset within the organization. As part of this Co-Learning Partnership, last year LEI helped facilitate several weekly job site coaching engagements that were only minimally disrupted because of the pandemic. On one of these, LEI lean coach and Toyota veteran Bryant Sanders worked at a job site in Dallas, where several trade partners were installing exterior panels on a building.

“The process did not follow what we would call continuous flow,” Sanders recalls. The contractor that fabricated the panels prepared them for installation—drilled holes, attached extrusion strips to the edges, and removed some protective film. Then the workers passed the panels to another team on a mast climber [motorized scaffold] to attach a z-shaped channel to the building and install the panels. In between, because of how the construction contracts had been awarded, another contractor was responsible for the insulation.

“That just added lead time,” says Sanders. “They would attach the channel and ride down the scaffolding; wait for the other trade partner to go up, install the

insulation and come down; and then go back up and install the panels.”

Communication between the teams was inconsistent as well, adds Sanders. For example, the prep team wasn’t always preparing what the install team needed next. Generally, people had questions about why they needed to spend time improving the process when they were already meeting their targets.

“They were, in fact, meeting their daily quota the way they were doing the work,” explains Bob Grimes, Turner vice president and director of lean, adding that construction teams often don’t recognize how unplanned disruptions affect overall productivity until the deadline nears. But then, the industry’s traditional reaction to these events is to add more people and extend work hours to close the gap.

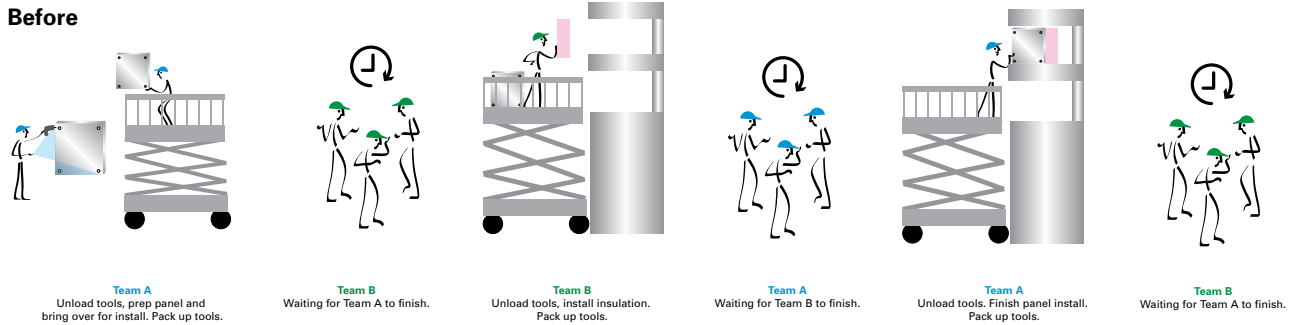
By the end of the week, the teams had improved productivity by more than 50%. ‘One day, they installed 21 panels, which far exceeded anything they had done in the past.’

— Bob Grimes

By the end of the week—with Sanders having coached them through job analysis, experimentation, process changes, and adjustments—the teams had improved productivity by more than 50%. “One day, they installed 21 panels, which far exceeded anything they had done in the past. And they weren’t breaking their backs; they were just working without the problems they’d had to deal with before,” says Grimes.

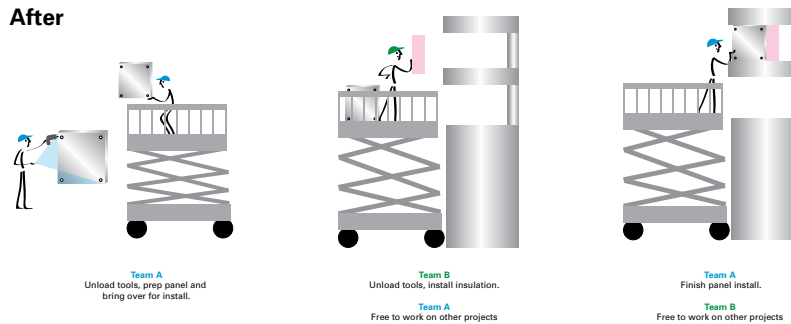
Improving the Process of Installing Exterior Building Panels

Before



Long lead time

After



Shortened lead time

Sanders notes that the results Turner achieved on its first project represent the quick wins construction companies experience when viewing the work with a lean mindset — and offer a glimpse of the enormous potential benefits of coordinating lean thinking and practices across the industry. For example, he explains that even if a trade partner finishes their work early, the next one has a scheduled start date. So, they can't start any earlier because they're finishing other jobs, which creates a gap in time that companies can't leverage and interrupts the continuous flow.

Caution: Productivity Improvements Ahead

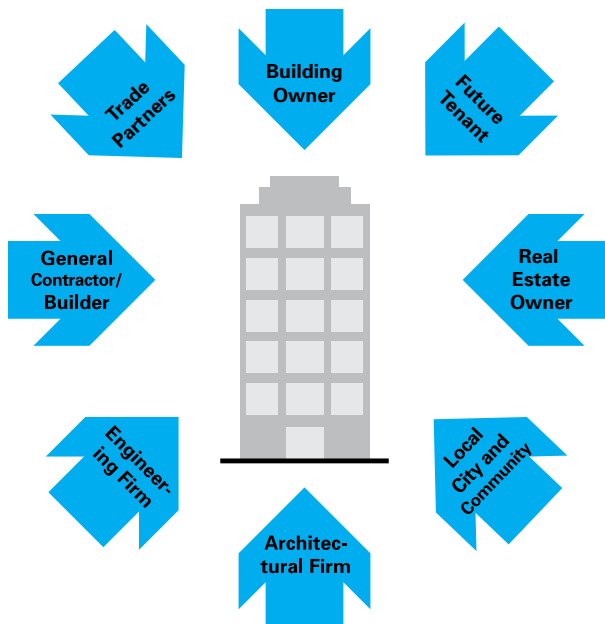
In the United States, the construction industry has been grappling with a shortage of skilled, capable people for years. Unlike manufacturing and IT work, construction cannot be outsourced to other countries with lower labor costs and fewer regulatory requirements.

On top of this, productivity in the construction industry has not improved much in recent decades. On the contrary, it has, by some measures, gotten worse.

Getting in the way of progress is the widely held belief that there's little to be gained by standardizing or improving work processes in construction because every project is different, with different timelines, plans, and expectations.

Another barrier to improving productivity is the number of different organizations that are involved in every construction project. Consider one building project:

Construction Project Stakeholders



The large number of groups involved in every construction project hinders the adoption of lean thinking and practice in the industry. Turner has had the most success coordinating work process improvements with its trade partners.

“In construction, although the work is repeatable, you only get one shot. Take this hospital in Dallas: We looked at where the painters were working on six floors. Once a floor is finished, it’s finished. We can’t go back and study it again,” he explains. “That’s very different from an auto plant where Toyota is building 1,000 cars per day. There’s a much longer runway for improvement in manufacturing.”

Opportunities Hidden Inside Every Challenge

There is an ingrained belief in construction that the work is physically demanding and tiring — and that that’s just the nature of the job. It’s even a point of pride. Everyone in the industry has lived with the strenuous physical demands for so long they don’t even see it as an issue. The work hasn’t necessarily been designed to be hard. But neither has anyone designed it to be less strenuous.

Redesigning the work eliminated significant physical strain and reduced the installation cycle time for eight cables from 239 minutes to 24 minutes.

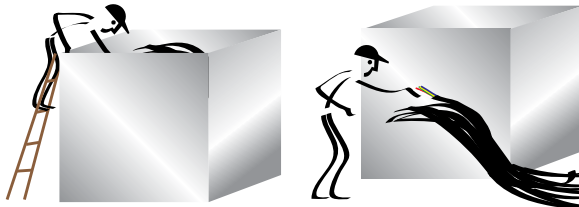
— Bryant Sanders

In any industry or business, when poor job design makes work harder than it needs to be, it increases costs and leads to schedule overruns and rework. From a lean perspective, improving the work — removing the difficulties that cause sore hands, sore backs, and sore legs — demonstrates a respect for people, especially for trade partners and the work they do. Showing this respect is a key goal at Turner, where Actively Caring for each worker on the project sites is one of the five elements of the company’s path to success.

It comes as no surprise that making the work less physically difficult can impact productivity. In one example LEI previously shared, electricians struggled to install conductors into an electrical panel. Redesigning how the work was done eliminated the physical strain and reduced the installation time from 110 minutes to four minutes.

At the Dallas job site, the team similarly redesigned the installation of cables. In this case, redesigning the work eliminated significant physical strain and reduced the installation cycle time for eight cables from 239 minutes to 24 minutes. “We captured those guys’ hearts when we made that job so much less difficult,” Sanders recalls.

Redesigning the Work of Cable



Before: Terminating the cables inside the cabinet was difficult for the worker to reach, causing strain and causing the installation time of 239 minutes.

After: Redesigning how the work was done eliminated the physical strain and reduced the installation time to 24 minutes.

The Three Cs: Learning to See the Pain

To remove the physically demanding aspects of the work, you have to be able to identify them quickly. As noted above, the runway for making improvements on the construction site is short; the repeatable work needs to be evaluated and acted on promptly. Adapting what he learned at Toyota, Sanders shares a critical-thinking framework to help people see the work better, which he calls the “critical eye.”

To help develop this critical eye, he divides the work into three parts: content, characteristics, and categories, as shown above.

Consider drywall work as an example. After the drywall panels are fitted and installed, the joints are taped, the drywall compound is applied and allowed to dry, then the walls are sanded flat. Applying the joint compound is cyclical work; retrieving additional compound when the worker runs out is periodic. Efficiency gains come from keeping the work as cyclical as possible.

Here’s another example. An electrician’s job on a particular day is to terminate wires inside an electrical

The 3C Framework

Content	<ul style="list-style-type: none"> • Value add • Nonvalue-add (waste) • Incidental/auxiliary (necessary but doesn’t add value)
Characteristics	<ul style="list-style-type: none"> • Easy or difficult (physically hard) • Overburdened • Uneven
Categories	<ul style="list-style-type: none"> • Cyclical (happens at a regular cadence) • Periodic (doesn’t happen every cycle, but happens with some frequency) • Abnormal (to be eliminated)

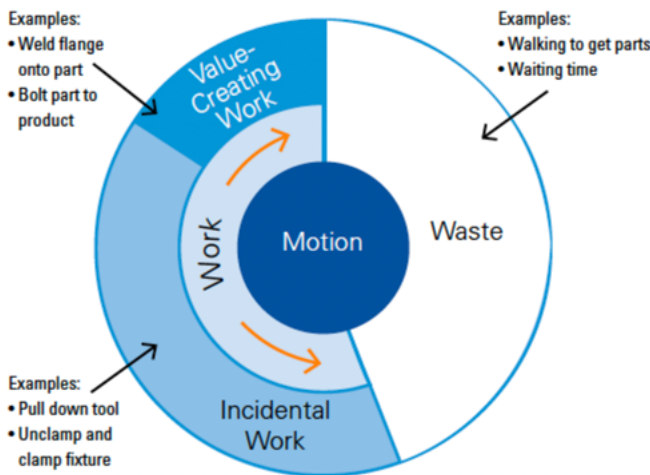
cabinet. At the start of the day, they will know their assignment but not which cabinets to work on or how many terminations they must finish. With a detailed daily work plan, an electrician can gather all the supplies needed to do the job without having to stop at any point to retrieve additional materials, thereby minimizing periodic work.

The final work category is abnormal work — anything that happens that shouldn’t happen. After identifying abnormal work, workers can establish standards and countermeasures to eliminate it.

Sanders offers an example he saw on a Turner job site in Denver. “They were shaking out the deck, attaching the tin bottom to the cross members before pouring concrete to make the floors,” he remembers. “They started the job but soon realized that they didn’t have the tool they needed to rivet the panels in place. So one guy had to go find it while the other two sat around being paid but unable to do any work.”

Falling under the banner of gemba-based improvement (GBI), LEI's support is designed to help more people at Turner Construction see the work in terms of the three Cs. The emphasis is to reduce physical burdens, make the work more repetitive and cyclical, reduce the amount of periodic work, and eliminate abnormalities. In the decking example above, they built a job cart with a silhouette of every tool. Now, when the team moves to the next floor, they can easily see if they have everything they need and are less likely to leave anything behind.

The Categories of Work Motion



Human actions (motions) involved in producing products can be divided into three categories based on their value to the process.

This approach is different from a single-minded drive to eliminate waste. Identifying physically demanding work requires studying the work in greater detail — at the task and individual worker level. Sanders explains: Many novice change leaders watch people work and look for ways to improve the process. If anyone is standing around, they recognize the wasted resources and give them another assignment. Equipped with a menu of lean tools, they try to implement any of them that seems useful. After giving a team a list of action items to improve, they get frustrated when workers adopt few or none of the recommendations.

The other weakness of giving people a list of improvement to-do ideas is that they must stop doing what they're doing to implement them. Everyone in construction — and most jobs, for that matter — is recognized, rewarded, and promoted based on output, how much they produce, and how quickly. Any suggestions or additional work that undermines immediate output they logically ignore.

That's why, besides focusing on actual pain points, the GBI approach seeks to generate a list of improvement ideas and immediately commandeers the necessary resources to implement them. Speed is especially critical in construction, where the window of opportunity to make improvements and capture the benefits is tight.

Building Momentum in the Construction Industry

LEI and Turner coordinate conversations between trade partners To improve uptake and overcome objections on construction job sites. For example, having trade partners in San Antonio who have directly experienced the benefits of the GBI process talk to their peers in Denver or Dallas makes it easier to overcome potential misgivings and objections.

At Turner, we're playing the long game. By building deeper relationships with our trade partners, we will reap the benefits for the long term, allowing us to deliver greater value to our clients.

— Bob Grimes

It doesn't hurt that the financial gains mostly benefit the trade partners. After all, they've bid on the work and won the contract based on certain labor expectations. So, any changes that make the job easier or reduce the labor hours go straight to their bottom line.

Other significant and immediate benefits for the general contractor are increased safety, reliability, and schedule adherence. “At Turner, we’re playing the long game,” says Grimes. “By building deeper relationships with our trade partners, we will reap the benefits for the long term, allowing us to deliver greater value to our clients.”

A more daunting long-term challenge is how to work the lean approach and mindset into contracts from the beginning, to work it into the requests for proposals. To do this, people at the general contractor level must understand each project’s work requirements from a continuous flow perspective. Then, they can build potential efficiencies into the contracts (avoiding situations like the exterior panel installation described above).

“You have to take these learnings and discoveries back to the front-end of the process,” says Sanders. “Turner is embracing it — call it kaizen leadership or lean leadership—this is how the industry as a whole can begin to change.”

Management’s understanding must deepen so they can set the appropriate expectations. They have to push a vision that eliminates unnecessary hard work, for example. Engineering organizes the work the way it does for logical and historical reasons. Operations leaders must expand the factors that engineering considers during the design phase, eliminating upfront the difficult termination of conductors in the electrical panel, for example. More people in construction need to see the physical strain and future aches and pains as literal pain points that can and should be alleviated.

Another challenge, Sanders adds, is the need to move more quickly. Turner has over 10,000 employees. To expand the number of people exposed to the GBI methodology, Turner is working with its internal, self-perform group that executes some of the work on various projects like concrete or carpentry. That way, the company can directly realize some of the financial benefits, which always catches people’s attention.

Turner is dedicated to moving forward, understanding that progress is built by experimenting and capturing the learning. While the existing Turner staff is working on learning and implementing these concepts, Turner has its eyes on the future, looking forward to engaging and helping people who are just coming into the industry to learn how to see the work differently.

Turner’s Lean Structure and the LEI Co-Learning Partnership

LEI’s engagement with Turner Construction Company began in 2017 when Jim Barrett, Turner’s vice president and chief innovation officer, met with LEI Coach Mark Reich and John Shook, an LEI senior advisor, in Boston. Barrett believed that lean had been too narrowly applied in the construction industry, and there was significant untapped potential. He said he wanted Turner to be a leader in expanding its impact.

In response to that leadership pull, Reich led a pilot A3 problem-solving project among the company’s senior leadership team in its New York office. New York is the company’s largest operation in terms of annual sales. Rather than start on the job site, where LEI typically gets down to work, Reich’s intent was to leverage leader engagement and change their mindset. Changing their perspective would help them appreciate the potential and eventually cascade the new thinking and practices down to the building sites.

The pilot project did, indeed, open people’s eyes. The participants thought they spent a lot of time on job sites and understood how best to solve problems. The exercise demonstrated how they were mostly just firefighting and not really seeing the work. New York began to share their renewed understanding with the other regional leaders.

Turner has an established lean/continuous improvement program with dedicated resources. Senior Vice President Matt Papenfus is responsible for the company’s central region, with offices in Dallas, Houston, San Antonio, Austin, Denver, and Kansas

City. He is also the senior leader driving the company-wide adoption and implementation of lean practices. Bob Grimes, vice president and director of lean, reports to Papenfus and coordinates the activity of regional lean leaders. They, in turn, support local lean managers in each office (40-plus across the United States and Canada), who are all well-versed in the Last Planner System™, a production control system developed by the Lean Construction Institute.

Following the pilot project with LEI, Reich met with Turner's CEO and executive leadership team every quarter in 2019. They spent an entire day learning about lean's untapped potential in construction in discussions, touring Herman Miller and Turner job sites. In addition to expanding the executives' thinking, the engagement clarified the business's need to embrace lean methodologies more deeply.

At that time, Turner and the entire construction industry faced a labor shortage. Reviewing video recordings of work on the job site during the quarterly lean exercises, company executives began to understand how much productivity could be improved.

The targeted gemba-based improvement (GBI) projects described in this article began in 2020, mostly on job sites in Texas and Colorado. They continued throughout much of the year despite the pandemic. Each team participates in three projects with increasing responsibility each cycle for identifying and implementing changes.

In addition to implementing work process improvements, Turner aims to achieve four learning objectives through the GBI projects:

- Develop a “critical eye” and other lean capabilities among trade partners and Turner's staff.
- Deepen senior leaders' appreciation for practical problem-solving.
- Help executives understand the business case and potential financial gains.
- Build capabilities for making the work safer, easier, and more efficient.

This strategy that Turner is pursuing with LEI's support is a significant commitment. Time will tell how much of an impact these efforts have within Turner and the construction industry as a whole. ■



About Turner Construction:

Turner is a North America-based, international construction services company and is a leading builder in diverse market segments. The company has earned recognition for undertaking large, complex projects (such as Southwest Neighborhood Library in Washington D.C., shown above), fostering innovation, embracing emerging technologies, and making a difference for their clients, employees and community.



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.

lean.org

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

- Thought-leading content delivered monthly to your inbox.
- First notice about LEI events, webinars, and new learning materials.