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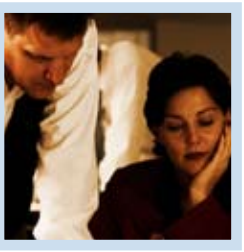
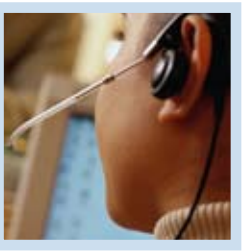

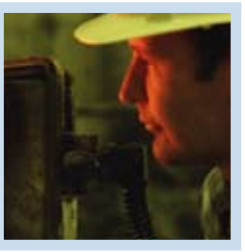

Achieving Lean Success: A Pathway for Implementation

by Dana Ginn and Lynda Finn

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Martin's Story: A Call Center Tries to Adopt Lean

Martin was the supervisor in a call center for a retail internet ordering service. He had attended a Lean seminar and wanted to implement some tools to improve the work in his group. But, when he went back to his workplace, he had difficulty implementing what he had learned. First, many of the examples on how to use Lean tools presented in class were based on processes very different from his and he wasn't sure how they applied in his particular circumstances. Second, while the tools made sense and he understood their value, he was not clear on where to start. He needed a methodology or road map that could show him how to begin or what tools to use first. He knew he couldn't give his staff—all novices in Lean—a clear direction for what they were going to do until he figured it out for himself.

Sylvia's Story: Lean Application in a Printing Company

The CEO of a printing company was well aware of the intense competition his company was facing. When market forces began driving down prices, he knew he had to act to reduce operational costs quickly and to attract more customers or face the possibility of going out of business. He had heard about Lean from a colleague and began educating himself in Lean deployment. He then named Sylvia, an up-and-coming staffer to the VP of operations, to head up Lean implementation in the company. Sylvia had some experience in Lean at a previous company where she led an effort to reduce waste across the organization.

Initial results from the Lean implementation were promising. In the first nine months, the company significantly reduced rework and other non-value-added activities in their processes, particularly in order entry and pre-press. With these changes, the company was able to reduce costs and was positioned to be more profitable. However, Sylvia and the CEO soon realized that these improvements were not translating into increased customer satisfaction. There were still customer complaints about delays and errors.

Further investigation led Sylvia to realize that although the company had eliminated a great deal of waste; this was just the tip of the iceberg. She had to go beyond the obvious—rework, unnecessary process steps, and so on—to dig deeper and look at other waste drivers in the organization.

Sylvia discovered that there were management policies and procedures in place that caused additional problems on both the print floor and in administrative offices: (1) **overburden**, functioning above designed capacity, where performance is often unstable, and (2) **unevenness**, variation or swings in the

Need a Review of Lean?

In case you're new to Lean, here are some key terms.

The purpose of Lean is very clear: to produce the **right amount** of **high quality** products and services (as defined by your customers) at the **right time** (based on demand) with the **least amount of time, effort, and cost**. The terms in bold reflect the emphasis that Lean places on (1) understanding customer requirements; (2) pacing the workflow so that you neither over- nor under-produce; and (3) critically examining a process so you can identify steps that may harm quality or add waste.

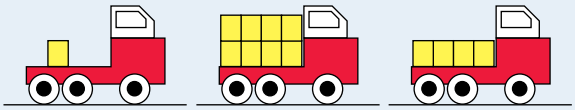
Value-added (VA) work: essential work used to produce, deliver, and service the products or services that your customers want.

Other necessary work (sometimes called "required" work or "business non-value-added"): work that does not add value to your product or service but must be done for business, legal, or regulatory purposes (such as maintaining fiscal records, documenting hiring practices and compliance, working within current technology constraints).

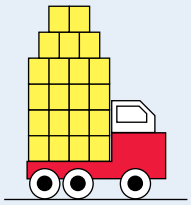
Non-value-added (NVA) work: work that does not add value from the customer's perspective (they wouldn't want to pay for it if they knew it was happening) and is not required to run the business; this is everything else that happens in the process. NVA includes fixing mistakes, excessive motion of employees or movement of materials, unnecessary process steps, etc.

Waste (muda): all of the NVA work and its repercussions in the process (delays, excess inventory, etc.).

Unevenness (mura): fluctuations or variability in workload either within a process step or when comparing different process steps.



Overburden (muri): excess demand on people or equipment (often linked to the unevenness of work, such as monthly or quarterly pushes toward the end of a quarterly period).



Value stream: the entire set of activities required to bring a product or service into the hands of the customer (from *Lean Thinking*, Womack and Jones, 1996.) Value streams are typically defined for each product or service family, which is a set of products or services that utilize essentially the same flow of processes and equipment to deliver products or services into the hands of the customer. For example, a banking company may have three key service families: credit cards, personal loans, and business loans.

work flowing through a process.

An example of a policy that led to these problems was the practice of rewarding each customer representative based on the volume of orders that he or she processed in each quarter, which had the following effects:

- Noticeable peaks and valleys in the number of orders processed by the reps and then sent to the print floor just before the close of each quarter (unevenness). This would cause presses to be alternately overutilized then sitting idle, which led to various maintenance problems that affected both the timeliness and quality of print jobs.
- Development of individual work processes that worked best for each representative, with no incentive to follow a standardized best practice.
- Creation of an environment where the reps were determined to "go it alone" even if they were currently overburdened (there were no incentives to distribute work evenly among the reps). When overburdened, the representatives

would make more mistakes. The increase in mistakes, coupled with the elimination of inspection activities as part of the initial waste reduction effort, increased the percentage of errors that remained uncorrected and thus seen by the customer. Paradoxically, the initial Lean efforts in some cases led to poorer quality and greater customer dissatisfaction.

Sylvia discovered that management practices weren't the only thing driving overburden, unevenness, and waste; process and product design issues also contributed. For example, one printing press was designed in a way that made cleaning difficult and time-consuming, causing extended down periods. Another example was having a complex internal process for credit approval for new customers, which affected response time on first orders.

Sylvia then realized that she had made a mistake common to many organizations: she had focused on the most basic use of Lean tools to eliminate obvious sources of waste while overlooking the Lean approaches that could be used to eliminate key *drivers* of waste. She would have to revisit the company's Lean training curriculum, practices around identifying and prioritizing Lean projects, and messages to employees about what kinds of improvements they could achieve through Lean. She would also need to work with the CEO to identify key drivers of waste in the organizational policies and management systems or stemming from improper process or product design.

Why a Map Would Help

What these cases have in common is that the companies were not able to fully realize the benefits from their Lean efforts. In the first case, Martin was not clear on how to get started nor which Lean approaches he should apply given his particular call center application. In the second case, Sylvia needed help in going beyond the simplest application of Lean tools to identify and address the *drivers* of waste throughout the organization.

A road map would help Lean practitioners identify and address waste and its drivers, as well as understand how and when to apply the various Lean approaches in the organization in order to achieve business results. The map would also help Lean practitioners use the full suite of tools to realize the greatest benefits. Lean Pathway is our road map.

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A Vicious Cycle

This printing company's investigation into why its Lean efforts were not returning the expected dividends helps confirm the vicious cycle that exists in many processes today, as illustrated by the following diagram. While this company initially attacked obvious types of waste in their processes, they failed to attack unevenness and overburden, which generate more insidious forms of waste—the kinds that are often accepted as simply "part of doing business." Often, management policies and procedures or the design of the products and processes cause this overburden and unevenness. Figure 1 depicts the relationships between these drivers.

- Process and product design as well as management policies and procedures are base drivers. A poorly designed product or process can drive all three problems: overburden, waste, and unevenness. In addition, any process, no matter how well designed, can be driven to overburden, waste, and unevenness through flawed policies and procedures.
- Waste, overburden, and unevenness are shown in a circular relationship, as each one can drive the other.

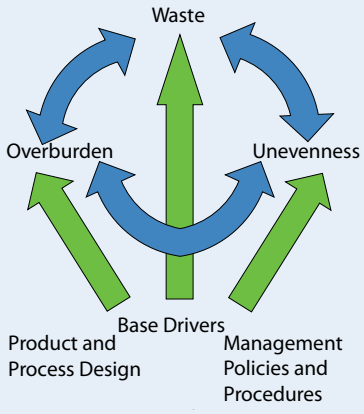

Figure 1: Waste and Its Drivers

Introduction to the Lean Pathway Model

Our Lean Pathway model is based on our experience of working with many Lean experts in a variety of industries and situations. We noticed patterns that characterized the most successful Lean deployments across different organizations. The general approach is for each *work area* to focus on improving local processes while *the organization* coordinates the flow of work across the entire value stream. Although the sequence of implementation may vary based on the type of waste identified or on the specific usage, successful applications of Lean typically include five major steps, as shown below.

1. **See the waste and its drivers.** This activity provides a systematic way of exposing and defining both the types and amount of waste in a specific process, work area, or across a value stream, as well as the key drivers of waste. Value stream maps and other tools are used to identify specific Lean improvement opportunities.
2. **Prepare the workplace.** Once companies know where to target their efforts, the next step is often cleaning house. Clutter in workspaces (physical and virtual) is cleared, and spaces are organized for optimal efficiency. This applies to all work areas, from production or processing to administration.
3. **Improve the local work.** When the clutter is gone, there is a clear playing field to find ways to improve both the quality and productivity of everyday work.
4. **Eliminate waste due to setup and maintenance.** The efficiency of some (but not all) processes is linked directly to "setup" or "changeover" time and/or maintenance. (As described in the printing company case, maintenance problems led to breakdowns, which contributed to unevenness, which in turn drove overburden and waste.) In manufacturing, equipment reliability and setup is a critical component of producing high-quality products and services in the right amount at the right time at the lowest possible cost. Eliminating waste due to setup time and maintenance applies to all industries and applications even outside of manufacturing. In service, when processes are functioning effectively and efficiently, companies turn their attention to the support systems (machines, computers, and databases) whose unreliability contribute to waste. Also in service industries, the ability to change quickly from one project to another (an example of setup) can also significantly reduce waste.
5. **Coordinate work/make the value flow faster (attacking overburden and unevenness).** While local improvements are being made, successful organizations also improve the overall coordination, timing, and flow of work between processes and functions. These activities typically address some of the drivers of waste, such as overburden and unevenness. This step is often more difficult to accomplish unless some key local issues are addressed first.

These steps form the basis of the Lean Pathway, shown in Figure 2.

Isn't There a Standard Model for Lean Implementation?

There are a few conceptual road maps for Lean implementation used in organizations today. However, these road maps typically focus on high-level phases that are easily applied with an expert's help. In our experience, there is no standard model used for implementing Lean that unites the concepts with the specific tools and techniques and is also easy and accessible to staff members across all industries.

The reason why there was never a standard model for Lean implementation, like the DMAIC model for Six Sigma, is open to speculation. For one thing, although the various components of Lean started in the same industry, they evolved semi-independently in different areas of the factory floor (although eventually they became integrated into a Lean system). Organizations that successfully deploy Lean without a detailed road map often have to invest heavily in training and education to produce numerous "Lean experts" dispersed throughout the workforce. This way, people new to the discipline always have access to expert coaching.

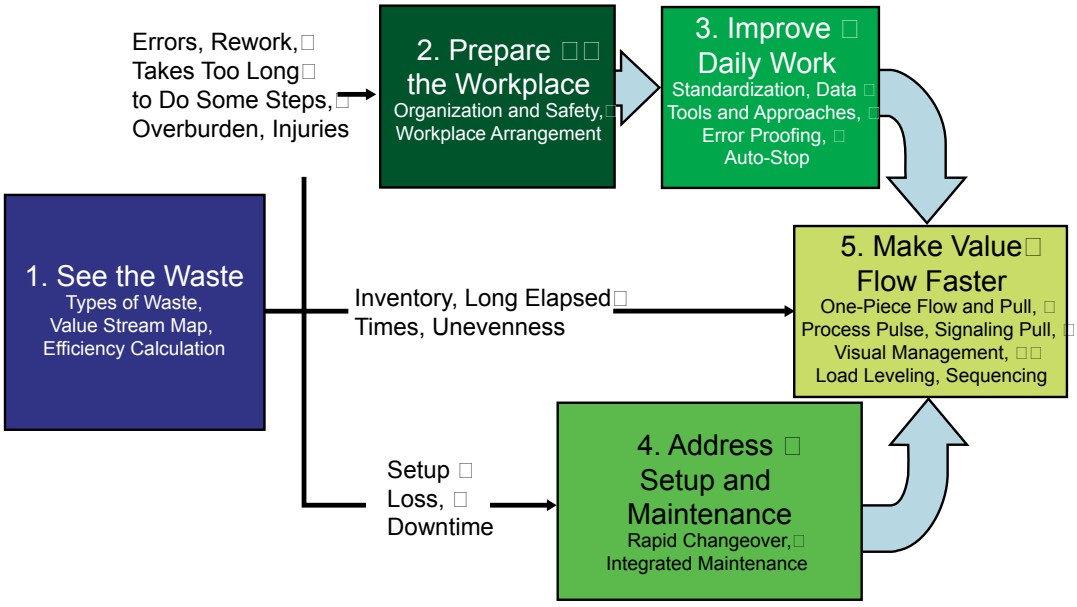

Figure 2: The Lean Pathway

CAPTION: This pathway illustrates the five sets of activities that characterize the most effective Lean deployments. In each step, you'll also see the names of common Lean approaches. For example, Step 2 lists the approaches associated with maintaining a clean, well-organized workplace and arranging the workplace to maximize flexibility and minimize motion.

The Lean Pathway is designed to speed up Lean deployment and help an organization progress from an isolated project-type implementation to a more comprehensive transformation-based implementation. Like the more rigorous methods found in other improvement initiatives, such as Six Sigma, the Lean Pathway is both **prescriptive**—suggesting a logical sequence of implementing Lean—and **flexible** enough to be useful in diverse situations.

Step 1 of the Lean Pathway is a systematic, comprehensive effort to identify waste and the drivers of waste in your organization. The output of Step 1 is identification of different improvement opportunities linked to the specific types of waste you've uncovered.

Once these issues are identified, you can continue on one or more of three paths.

- If the waste is primarily focused on the worksite and individual processes—as indicated by errors, rework, long process steps or operation cycle time, overburden of resources, or safety issues—taking the top path is the best route (go directly to Step 2 then Step 3).
- If the waste is related to downtime and changeover, then taking the bottom path is the best route (go directly to Step 4).
- If the waste is related to the flow of materials and information throughout the system, go directly to Step 5 (the middle path). As depicted in the diagram, you would end up there eventually, no matter what path you take, but if these are some of your biggest problems, it is OK to tackle them directly without working on other problems first. However, this step can be more difficult to accomplish if some key local issues have not been addressed first.

You could also pursue parallel routes at the same time. For example, you may want to work on reducing errors using Step 2 approaches and at the same time work on reducing changeover time using Step 4 approaches.

Finally, if you are unsure of what to do—which is common when people use Lean for the first time—start with Step 2 and continue in numerical order. As you gain more experience, you'll get better at linking the types of waste you see to different Lean approaches.

Note that because all of the Lean Pathway steps and approaches are interrelated, work on one step can positively impact another. For example, preparing the workplace and improving daily work will make value flow faster. At the same time, addressing setup and maintenance issues will also contribute to making value flow faster.

Getting the Most from the Pathway

Although the Lean Pathway diagram implies a linear route starting at Step 1 and ending at Step 5, the model is iterative. Each time you identify waste, you work to reduce it and its drivers. When you make progress, you continue to cycle back to Step 1—identify waste and opportunities for improvement and then address those opportunities using one or more of the paths. The model supports Lean thinking and ongoing continual improvement across the organization.

When used in this way, the Lean Pathway can:

- Help ensure you are focusing not only on waste but also on the key drivers of waste, such as overburden and unevenness (which are often a direct result of organizational policies).
- Provide a method to implement Lean that even beginners can follow.
- Help you to prioritize improvement projects.
- Help you to develop internal experts more quickly by associating Lean approaches with specific improvement opportunities.
- Help staff members make reasonable decisions on their own about how to identify opportunities, what approaches to use in which sequence or in what circumstances (though sometimes it still helps to have expert guidance), and how to use this thinking on an ongoing, everyday basis.

Tips on Avoiding Jargon

In addition to providing a road map to follow, we recommend making the Lean approaches more accessible to people in all industries by demystifying and clarifying the Lean terms. For example, instead of using the term "production leveling," discuss how to "sequence the volume and type of production/service processing based on demand." Instead of using "Single Minute Exchange of Die" (SMED), talk about "reducing changeover time from one project to another, or from one machine to another."

Using the Pathway: Sylvia and Martin Revisited

We now return to the stories presented earlier to discuss how Sylvia and Martin could use the Lean Pathway to address their issues. The pathway can be used to deploy Lean in two ways:

- **Top-down:** Senior and middle managers identify how Lean can address company priorities and barriers to producing and delivering the highest quality products and services at the lowest possible cost.
- **Bottom-up:** Individual employees or small workgroups begin generating improved workflow and reduced cycle time within their process.

Top-Down Deployment Example: Sylvia's Use of the Lean Pathway

Since Sylvia's responsibility is to deploy Lean across the entire printing operation, she will use the pathway in a top-down manner. Top-down implementation typically starts by looking at the entire organization or at key value streams focused on specific product or service families. Opportunities for improvement are identified (e.g., long lead times to fill customer orders) and fulfilled. At the same time, looking at the organization from a top-down approach can also identify local issues in lower level processes or in specific work groups (e.g., data on

customer complaints identifies a high number of errors in order processing).

In Sylvia's case, the deployment starts with completing Step 1: See the Waste. She and her team identify the types and drivers of waste common to their production and administrative processes. They create and analyze value stream maps of core processes and calculate the efficiency of equipment and resource pools. Lean is then deployed through the following activities:

- Use the methods described in workplace prep (Step 2) and improving daily work (Step 3) to **reduce errors and rework in the order entry process**.
- Simultaneously, launch two projects: the first to **reduce overall lead time on order delivery**, and the second on the print floor to **reduce downtime on a particular printing press** that was causing major problems in unevenness and overburden.

This approach is shown in Figure 3.

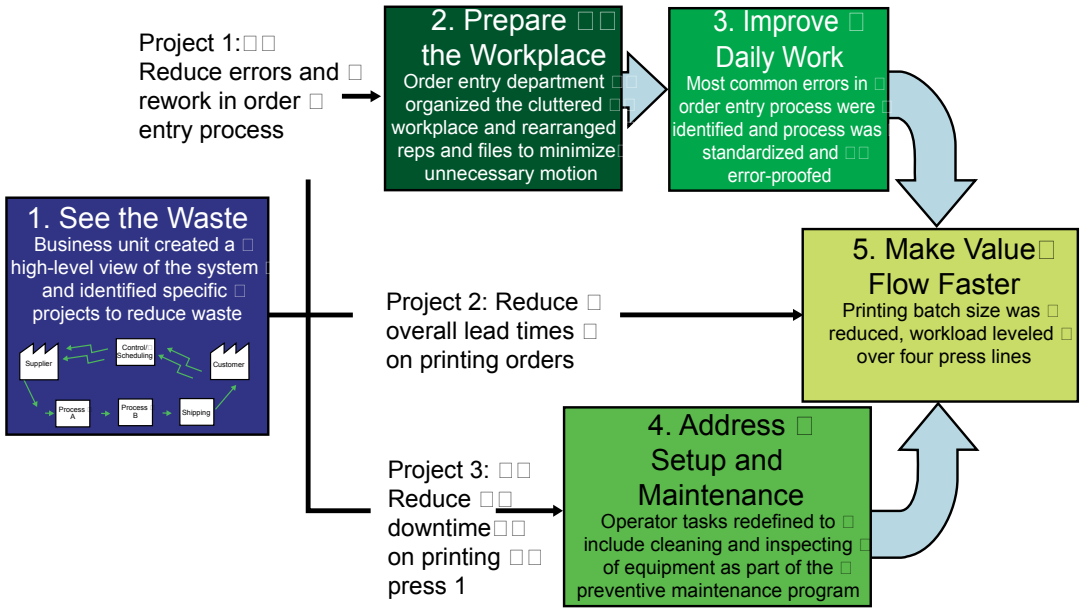

Figure 3. Top-Down Deployment Example: Sylvia's Use of the Lean Pathway

Bottom-Up Deployment Example: Martin's Use of the Lean Pathway

Since Martin's focus is just on the call center activities, he will use the pathway in a bottom-up manner, empowering specific work groups in the call center to continually identify and address waste on their own. Some priority areas could be (see Figure 4):

- Fixing safety hazards posed by computer cables—addressed by "preparing the workplace."
- Preventing errors—dealt with in "improve daily work."
- Reducing overburden and overall lead time—both best addressed by approaches for making the work flow faster.
- Reducing the time it takes to switch between accounts (a setup problem).

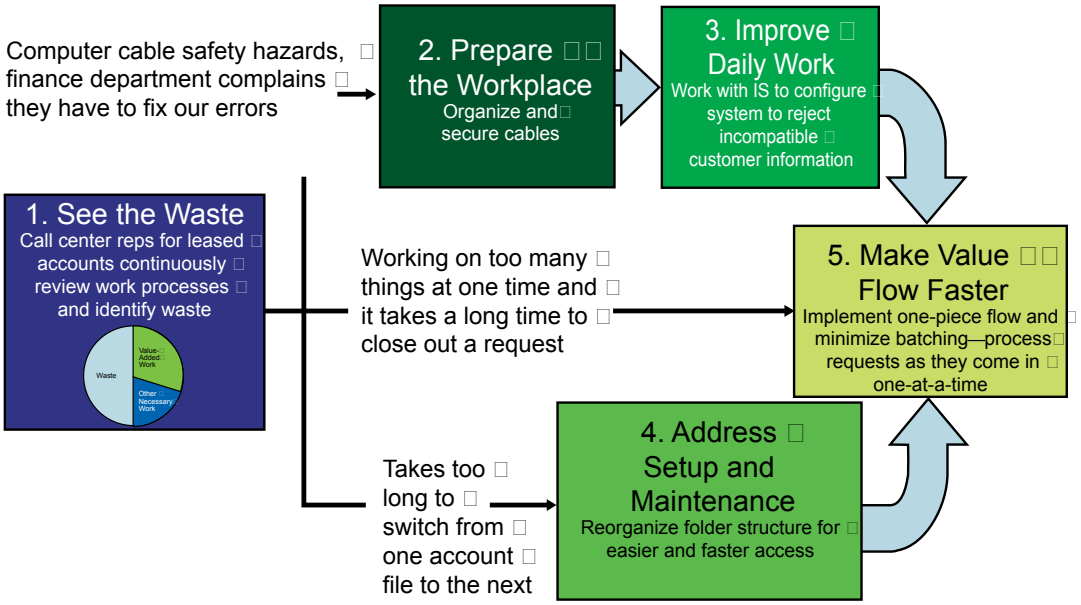

Figure 4. Bottom-Up Deployment Example: How Martin Could Use the Lean Pathway

Combining Top-Down and Bottom-Up Approaches

Both of the strategies outlined here are valid. Anecdotal evidence suggests that companies go through a maturation process where they use both either simultaneously or in different stages.

- Early on, they allow local worksite implementation on well-defined projects because this ensures that employees gain experience with Lean approaches and tools by working on problems they care about.
- Once the company learns first-hand the power of Lean methods, leadership wants to make sure their resources are being used most effectively. The choice of Lean projects is then driven by strategic priorities.
- As employees get better at using Lean approaches and tools, the company adheres to a strategic model for most Lean projects, but begins to allow—even actively support and promote—employees to use Lean approaches and tools ad hoc whenever they run into problems they know can be tackled using Lean.

The ideal model for the majority of Lean work in any organization is implementation driven by strategy. The sequence outlined here makes the most sense because it's difficult to know which strategic goals can be impacted by Lean until you've become acquainted with the approaches and tools. Once you gain some experience, encourage employees to continuously improve their work while the organization focuses on strategic deployment.

Other Benefits of Lean

Some organizations consider Lean simply a method to improve efficiency and reduce costs; but Lean is much more. Implementing Lean approaches impacts efficiency *and* effectiveness. Productivity, costs, errors, quality, customer satisfaction, market share, and return on investment are all positively impacted when Lean is successfully deployed. In addition, Lean can help to free up resources and capacity to invest in innovation and the future.

And, because Lean challenges the way we think about work, it can change assumptions, behavior, and ultimately the culture of the organization. Lean is not just about fixing processes. Following the Lean Pathway while continually improving the organization using Lean approaches makes people better employees, managers, and leaders. Lean not only solves problems, but more importantly creates problem solvers.

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Conclusion

When taken individually, the Lean approaches and tools seem straightforward, each designed to solve a particular kind of problem related to process efficiency or effectiveness. However, when looked at collectively, deciding specifically where to start and how to deploy Lean to its fullest advantage can be confusing. Organizations struggle to incorporate Lean into everyday business—to go from an isolated project-based implementation to a transformation of the organization. The Lean Pathway presented here is an ideal way to solve this problem. It gives you a general model to implement Lean at every level, by every staff member across your organization.

As described above, the Lean Pathway—specifically a visual picture—helps to:

1. **Plan Lean implementation in your company.** Use the pathway to identify what needs to happen at the corporate level in what sequence. For example, you can be more confident that you're working on high priority or critical strategic areas if you "see the waste" first by creating value stream maps of your key product and service families.
2. **Build a common language and approach.** Having a common road map throughout a company makes it easier to understand what is and should be happening in different work areas—such as knowing that Department A has just started to "prepare the workplace" but Department B has moved through several phases and is now working on "setup and maintenance."
3. **Manage expectations.** A senior manager can use this diagram to help midlevel managers and supervisors understand what kind of work is required of them to support Lean implementation. Those managers can then use the diagram to communicate those expectations to their own staff.

Most importantly, by engaging everyone in the implementation of the pathway and focusing on continual improvement, this implementation model not only solves problems but creates problem solvers. This model results in changing mindsets and leads to changing the overall culture of the organization.

Integrating Lean with Six Sigma or Other Improvement Initiatives

Many companies interested in Lean are already involved in some form of improvement effort, such as Six Sigma or business process management. If you are in this situation it is critical that you integrate Lean with your current efforts—otherwise you risk setting up competing "improvement camps" in your company, with people bickering about which method is more useful rather than focusing on the best tools or method for the job.

Integration takes several forms. Minimally, Lean tools and methods should be taught alongside other tools or methods you teach. You will also need a plan to guide people on choosing the right tools for the right need. For example, many companies start by doing a value stream map (Step 1 in the Lean Pathway) then have a formal evaluation step where they decide how to handle different problems exposed by the map. Some problems may require a formal DMAIC analysis; others may be solved by launching into Steps 2, 3, 4, or 5 of the Lean Pathway.

To help you decide which approach to use, problems with root causes specific to the particulars of the process are especially amenable to a data-driven DMAIC approach. In contrast, problems that have root causes common across many different types of situations are more amenable to Lean approaches.

For example, if you want to understand why some yields on a chemical process are low, or why there is a particular type of customer default at higher than expected rates, a Six Sigma DMAIC approach is a good place to start. If you want to reduce inventory or cycle times, Lean approaches are a good place to start.

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Tips for Supporting a Lean Deployment

Having a clear, simple pathway is just one ingredient in a successful Lean deployment. Here's a quick checklist of other elements you should be paying attention to:

Focus on people—It's through the learning and experience of your employees that you will accrue the benefits from Lean. This means talking with employees to find out what they need to support their work, training and developing them to be better leaders, and helping them learn the approaches, tools, and techniques to improve their work.

Encourage small steps; build on success—It's tempting to look for "home runs" but success is more likely if you start out addressing problems you can easily solve. Publicizing these small victories and the people who achieved them can go a long way to creating a culture that values Lean thinking.

Align rewards—The single biggest factor in determining what can be accomplished is in how people are paid, promoted, and rewarded. Do your incentives promote standardization, teamwork, elimination of waste, overburden, and unevenness? Will people lose their jobs as a result of improvements? Often, rewards are the last thing to be addressed when in fact they should really be handled early on.

Identify and address other cultural barriers—Frequently, companies have other initiatives and approaches they simultaneously want to accomplish with Lean. It is important to articulate how these pieces support and work together; otherwise people easily lose direction and motivation. Also, it is good to position Lean approaches as building on, rather than replacing, past or even other current approaches.

Engage leadership—Lean efforts will succeed only if your organization's leaders believe it is in the company's and their best interests to make sure it succeeds. Some common ways to engage leadership include: 1) launch a Lean deployment on a key leadership process such as acquisition, strategic planning, or new product introduction; 2) build Lean implementation into executives' and managers' current methods of reviewing the business; and 3) have executives take the lead in the review of the overall initiative and individual Lean projects.

Have an infrastructure—Lean is a specialized discipline. While the basics are relatively easy to pick up and use, people will benefit by having access to experts. Also, you will want to have internal experts who can help with training, facilitation, and coordination. They can also help ensure that Lean projects are aligned to corporate goals and that the Lean approaches are used in a standard manner. This group of internal experts can be small, but is a key element in helping to sustain focus and priorities.

Special thanks to Sue Reynard. Sue is a professional business writer based in Madison, WI.