Lean in Industrial Goods

Driving to Breakthrough Performance
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Lean in Industrial Goods

Driving to Breakthrough Performance

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While many industrial-goods manufacturers have been using lean methods for a long time, few companies have achieved their full potential. A well-designed “fast lean” program can jump-start an effort that has underperformed, and advanced levers can take it to the next level.

**FOCUSBING ON FUNDAMENTALS**  
Quick wins in moving beyond a relatively basic level of lean development most frequently come from improvements in such fundamentals as equipment, processes, material yield, logistics, and inventory.

**ADVANCED LEVERS**  
Manufacturers that already have effective programs in place can move to an advanced level of lean by using more sophisticated tools, such as sales and operations planning, product segmentation and production and inventory strategy, and bill of process.
By now practically everyone in industrial-goods manufacturing has “done” lean in some form or other, having adopted 5S programs, kaizen events, standardized work, and numerous other techniques. Many have seen significant benefits, including lower costs, improved quality, better customer response, and a more engaged workforce.

Only a few such manufacturers, however, have been able to create sustainable world-class operations. Some companies manage to get only limited benefits from lean because their programs are overly broad and lack sufficient penetration. Some lack the necessary capital, manpower, or analytical tools. Others improve dramatically for a while but then lose momentum. They earn some real wins but can’t quite land the big prize: implementing standard processes across facilities or integrating all business units—not just production—under a coherent lean strategy.

For example, five years into a lean transformation effort, one industrial-goods company that BCG worked with hit a plateau. After making very respectable improvements in uptime and quality, results began to dwindle. The efforts up to that point, largely isolated within individual plants, had been opportunistic in nature and lacked top-down coordination across the network. However, by taking a hard look at its situation and assessing its opportunities more holistically, the company was able to reinvigorate the program through a “fast lean” approach, ultimately achieving cost reductions of 10 to 15 percent. The effort consisted of the following measures:

- Conducting data-driven fast-lean assessments at high-priority plants that refocused scarce resources on those improvement opportunities that could bring the most value in the shortest period

- Improving cross-plant coordination through internal benchmarking to identify performance anomalies such as machine/line rate and yield variances that could be corrected and subsequently exploited as quick wins

- Instituting a robust best-practices process linked to benchmarking that quickly identified and deployed best practices throughout the network

- Coordinating improvement efforts from the top down to allow opportunities to be prioritized at the network level and resources to be allocated effectively

The current macroeconomic picture makes accelerating and sustaining operational improvement an urgent priority. Manufacturers’ margins are under pressure. Com-
Commodity prices have been rising dramatically, which means that supply chain risks from factors such as fuel costs are increasing. (See the exhibit below.) Meanwhile, the earthquake and tsunami in Japan have underscored the constant threat to supply chains from natural disasters.

Manufacturers need to manage their costs more efficiently, protect their supply chains more vigilantly, and innovate more rapidly. That means jump-starting lean programs that have generated only modest results and turbocharging those that have yielded big wins but have not yet achieved their full potential. Manufacturers need to find ways to migrate to the more mature levels of lean.

Levels of Lean Maturity
Companies typically progress through three maturity levels as they improve performance, build expertise, and enjoy the resulting benefits.

**Level 1: Learning the Basics.** Entry-level lean practitioners are primarily seeking to eliminate waste in production. Their objectives typically include efficiency gains, cost reductions, improved quality, shorter lead times, and greater flexibility. Companies at this level understand the key lean tools and apply them at local factories but not consistently across the plant network. Through quick wins, they can typically achieve cost savings of 5 to 10 percent, for an immediate impact on the bottom line. Sustaining improvements over time and applying consistent standards across the network are the key challenges that companies must address in order to progress to the next level.

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**Global Commodity Prices, 2009 to the Present**

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**Sources:** London Metal Exchange; Steel Business Briefing; Bloomberg.
Level 2: Implementing a Lean Production System. Companies at this stage are among the top players in their industry. They are moving toward an integrated lean-production system that involves the whole manufacturing network. As a result, they can reduce value-adding costs (that is, all manufacturing costs except for raw materials and other inputs) by 10 to 15 percent, while cutting waste virtually to zero.

Companies at level 2 consistently apply common lean tools, principles, processes, and metrics across the manufacturing organization. However, they often overlook critical elements related to tools, organization structure, resources, incentives, and employee training and qualification. For instance, many companies lack knowledge experts, project management skills, a rollout support team, or clear definitions of roles and responsibilities. Getting the full benefits of lean also involves training and qualifying employees in standards development, company-specific tools such as loss analysis, autonomous maintenance, and continuous waste identification.

Progress toward a lean production system tends to unfold over a period of three to five years. Eventually, forward-looking companies begin to realize that lean benefits can and must be extended beyond manufacturing.

Level 3: Beyond Manufacturing. Companies at this level have a complete view of their nonvalue-adding costs. They have devised and implemented advanced techniques such as product segmentation and production and inventory strategy, as well as disciplined sales and operations planning (S&OP). The optimal production processes have been identified and leveraged using advanced tools such as bill of process (BOP). Most plants and overall equipment efficiency (OEE) levels meet global best-in-class standards. Manufacturing is a key contributor to funding growth.

Companies that want to push even further tend to focus subsequent lean efforts on administrative and service processes, where high overhead can hurt the bottom line. But even more complex functions such as R&D and engineering, which are harder to standardize, can benefit dramatically from lean principles and tools. Applying lean to such areas can deliver impressive results: lead time reductions of 40 to 70 percent, productivity increases of 15 to 25 percent, and error reductions of 50 to 70 percent.

Moving from one level of lean to the next can be difficult. However, organizations at all levels can create significant value by a continued focus on lean. Recently, we’ve observed that many companies trying to get beyond level 1 or 2 have begun implementing shorter, more targeted and effective lean programs. And many at level 3 are deploying a broader range of advanced techniques.

Focusing on Fundamentals
In BCG’s experience, companies that have had difficulty reaching an advanced stage of lean can derive consistent improvement by refocusing on fundamentals and thinking smaller and faster. A fast-lean “health check” and a few focused changes can have a huge impact on cost and performance. Companies can see major savings in specific areas within weeks—or even days. The key is to pick the
most effective improvement levers, weighing the tradeoffs among them and deciding which ones to tackle immediately. A successful fast-lean program involves the following:

- Prioritizing opportunities on the basis of time to results, relative effort, and financial impact
- Focusing scarce resources on top priorities to generate quick wins
- Developing a coordinated effort within and across plants to rapidly identify and adopt best practices in the identified priority areas
- Creating an environment in which speed and a certain degree of risk taking are rewarded

The best opportunities for quick improvements in manufacturing costs and performance typically lie in five areas:

- **Equipment**—by reducing machine downtime, improving maintenance, and boosting overall OEE and throughput
- **Processes**—by standardizing work, cutting out low-value steps, optimizing workflow, and improving line staffing
- **Material Yield**—by reducing loss from scrap and obsolescence
- **Logistics**—by boosting warehouse productivity and minimizing freight costs
- **Inventory**—by right sizing, rethinking levels of buffer stock, streamlining material flows, and improving demand forecasts

The key is to focus on a small number of specific levers in a few high-impact areas. At virtually every company we work with, the biggest opportunities for quick wins are in OEE, line staffing, and scrap reduction. These areas are easy to analyze, can often be changed without a major capital investment, and almost always have room for improvement no matter how much attention has been paid to them in the past.

For instance, at an industrial-products manufacturer with a one-operator-per-line setup, we discovered, through observation and basic analysis, that the line operators were spending considerable time engaged in activities that seemed to add little value. By reorganizing workflows and slightly modifying production lines to make the work area more concentrated, the manufacturer was able to assign two lines to each operator instead of one, reducing labor costs by about 40 percent.

Done right, a fast-lean initiative can light a fire under a lean program that has stalled at an early stage. That new momentum enables employees and helps the lean program become self-sustaining. A fast-lean effort can generate major savings, which can be enough to fund a larger lean transformation throughout the company.
There’s nothing more invigorating to an organization than fast performance improvements that people can see and touch—and that hit the bottom line.

**Advanced Levers**

Many smart, experienced managers have implemented lean programs that get past the basics. Even then, however, it is easy to stagnate. The needle keeps moving in the right direction, but not as fast as it ought to. Sometimes it stops moving altogether. Sometimes managers mistakenly think that they’ve gotten everything possible out of the program.

A central concept of lean is maximizing cross-functional coordination and cooperation, and this is what even those companies that have done everything right in applying lean techniques have the most difficulty achieving. We’ve found that moving to an advanced stage of lean development requires turning the organization’s focus to a set of advanced tools.

**Sales and Operations Planning.** The purpose of S&OP is to improve the alignment between supply and demand across an organization by better coordinating forecasting, new-product introduction, promotions, and other functions with production planning and inventory and supplier management. Effective S&OP helps clarify responsibility for decisions on both sides of the supply and demand equation. In many organizations, when S&OP programs are evaluated closely, we find that the level of preparation is limited, communication is at a high level only, and accountabilities are missing. The company’s leaders want to believe that cross-functional alignment is occurring, but often the reality is merely a set of ineffective meetings and continued suboptimal performance. Because of poor S&OP coordination, one drug maker had significant back orders, inventory write-offs, late shipments, and lost sales. A rigorous S&OP redesign, employed correctly and given time to flourish, produced a 2.5 to 5 percent improvement in gross margins.

**Product Segmentation and Production and Inventory Strategy.** Many companies treat all products the same way when it comes to production and inventory strategy. Dramatic improvements can be achieved by taking a differentiated approach to product groups. Products can be categorized according to specific characteristics, such as technical manufacturing and packaging requirements (machine and process elements) and production demand characteristics (high or low volume, stable or less predictable demand patterns, manufacturing cost, and inventory carrying cost). Companies that understand their portfolio of products and design strategies for each product segment in a plant can achieve more stable production schedules, allowing for improved optimization of materials, inventory, labor, and assets.

We worked with a global pharmaceutical company that had a long-standing difficulty meeting its production targets within a five-day work week, resulting in unplanned overtime and premium freight costs. Through better alignment of production and inventory strategies with specific product segments, the company was able to improve productivity by 20 percent, eliminating premium freight charges while improving customer service.
**Bill of Process.** BOP is a systematic approach to optimizing production processes and achieving common manufacturing methods. Similar to the standards set by a bill of materials, BOP focuses on a common set of processes with the goal of creating a shared approach across similar lines or across plants producing the same products. Thus, BOP is closely linked to the product design process.

The first step in developing an effective BOP is “commonizing” the high-level process sequence. For an automotive manufacturer, this would be the order of key process steps in vehicle fabrication and assembly, such as when and how the doors are installed, the instrument panel inserted, and the engine married to the vehicle. Next comes the commonizing of each process step within the high-level process and all its work elements—for example, the type of equipment used to marry the engine to the vehicle, the attachment points and tooling used, and the standard labor required. The final step is to leverage common practices across multiple process steps. Best practices such as using bins to “pre-kit” parts that travel inside the vehicle in order to reduce operator movement can be applied widely across assembly operations, resulting in a shared discipline across lines and plants alike.

Establishing a common BOP can provide benefits such as leveraging existing production networks and improving flexibility. For one industrial-goods client we worked with, the benefits included productivity savings on conversion costs of 5 to 10 percent, internal and external quality improvements of 5 to 10 percent, and capital expenditure savings (stemming from reuse and bundling) of 10 to 15 percent.

**Getting the Most out of What You Already Have**

There is often much unrealized potential in even a successful lean program, and significant opportunities for companies willing to tackle the challenges of cross-functional alignment. For managers considering whether to embark on this journey, we suggest asking the following questions:

- Is the production system operating to expectations, consistently and effectively across all plants in the network, or is a recommitment to the basics warranted?

- Has the company improved productivity but remained dependent on capital expenditures to hit improvement targets?

- Are best practices identified in individual areas but then not effectively leveraged across the organization?

- Is S&OP frequently misaligned or is a current program ineffective?

- Are all products subject to the same production and inventory strategy?

- Has the company really succeeded in creating a sustainable culture of continuous improvement?

Managers today are working in a cash-strapped and resource-starved environment. The macroeconomic forces that lie behind that environment are likely to only
intensify over the near term. We’ve found that in many companies, an existing lean program—whether relatively basic or advanced—is an underdeveloped resource. But tools exist to unlock its potential and deliver big value without a large expenditure. It is important that companies take advantage of them.
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