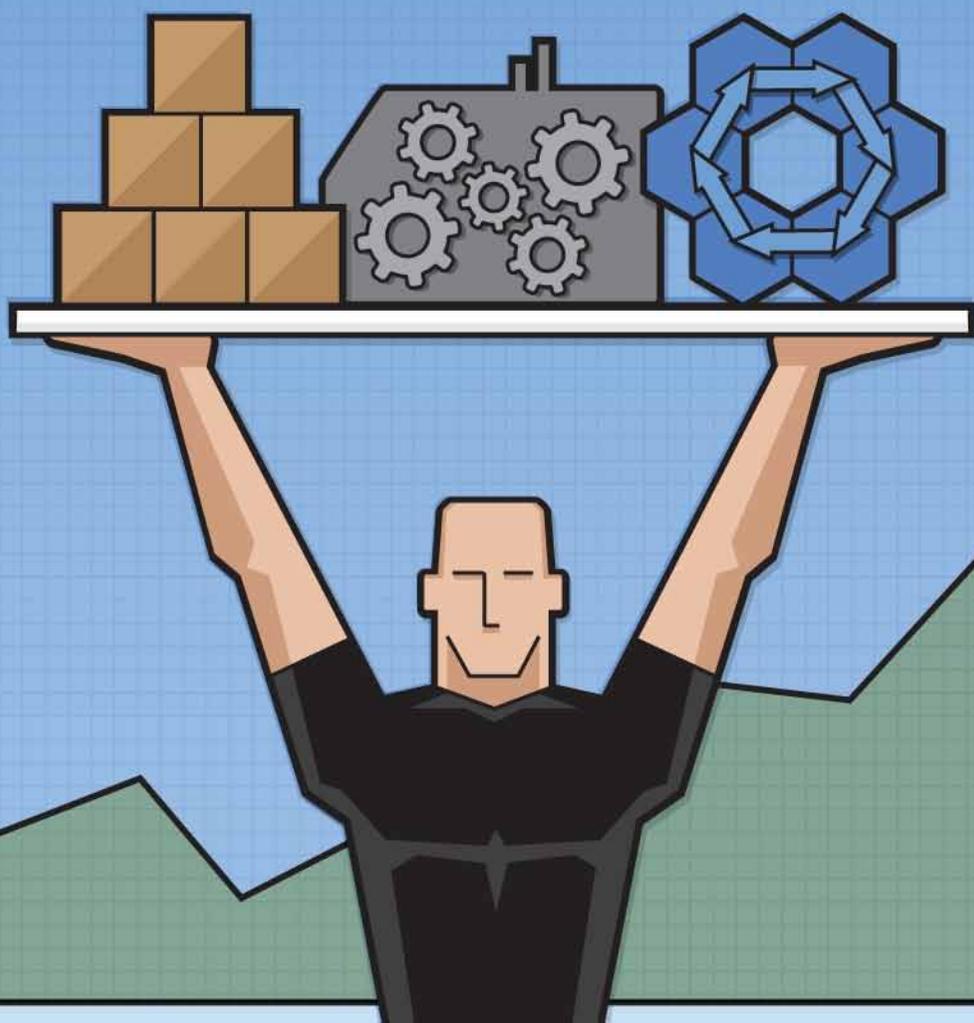


LEAN LABOR

A survival guide for companies facing global competition

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INTRODUCTION



I always look forward to watching “How It’s Made” - a television show that goes on site to different manufacturers and films the production process. “How It’s Made” has taken my favorite part of visiting a manufacturer, the production tour, and condensed it into a narrated, step-by-step 10 minute segment. The show documents a company’s manufacturing process from issuing raw materials to packaging a finished product.

I wonder if the show’s producers realize that in editing the actual video to fit into the show’s time constraints, what they have really done for the manufacturer is provide a vision of perfect execution. During each segment, machines never break down, there’s never a “cut to commercial” waiting for a critical operator to arrive, and material never warps ruining a production run. It’s a production manager’s dream, everything goes according to plan.

With “How It’s Made” providing this vision of idealized production, is it possible for a manufacturer to transform its processes to achieve the perfect day, every day?

There’s good reason to consider this; developed countries have been losing manufacturing jobs at an alarming rate over the past two decades to low-wage countries such as China and Mexico. Even China, with what many consider to be extremely low wage workers, is not immune to the impact of even lower-wage competition. A second generation of modern industrial workers is entering the job market in China with an increased standard-of-living expectation. These young workers see how others live in high wage countries and the resulting desire for an improved standard of living is driving up wages. With a global supply chain already in place, it becomes relatively easy to move low skill production jobs out of China just as quickly as they moved in.

Without a transformation in the way manufacturers produce goods and deliver services, manufacturers are relegated to chasing the lowest wages, moving production

from country to country. They seemingly have no choice, forced out as wage increases due to inflation and government regulation make them un-competitive in their existing plants.

When it comes to executing this transformation, companies don't have to re-invent the wheel. There is a wealth of information available to guide companies on how to improve their processes. The bigger challenge is how to motivate the workforce to change. What's required to successfully move towards ideal production is not a single big change, but hundreds of small changes implemented at all levels by all employees. Combined, these changes have a dramatic effect on costs and lead times.

One methodology has recognized the importance of placing the workforce at the center of a manufacturing transformation: Lean. Lean has done so by recognizing that the people who do the work are the same ones who will originate the ideas for improvement and put them into place.

Lean, a continuous improvement methodology, is built upon three pillars: Purpose, Process and People:

- Purpose: The reason the company exists.
- Process: The method a company uses to add value to its product and services.
- People: The people that participate and improve the process.

Companies applying Lean have the same goal as the production editor of "How It's Made." The production editor cuts away at what the film crew captured until just enough remains to educate the viewer about how a product is made. Lean companies perform a similar act when they analyze their processes with the objective of removing those activities that are not adding value to the customer. Lean's power is in the simplicity of its objective: If an activity adds value - keep it; if it doesn't - eliminate it.

Lean has been steadily growing in popularity over the past two decades. It is a culmination of the many improvements to manufacturing processes that started with Henry Ford who in 1913 integrated an entire production system to produce the famous Model T. The production of the Model T was efficient because there were no changeovers in production. With only one model in one color, the production line could be optimized for that one type of car. In the late 1940's as customers demanded more variety in cars, Toyota recognized there were ways to maintain similar efficiencies in production while offering more choices to their customers. Toyota began creating the tools and techniques to improve production and change from a "push" to

a “pull” philosophy where they built cars based on current demand rather than on forecasts. As these ideas matured, they became the basis of the Toyota Production System (TPS). Disciples of the Toyota Production System maintain the same philosophy today, believing it’s the people that can improve a company and everything else is a tool to support those efforts.

In 1990 James Womack, Daniel Roos, and Daniel Jones published “The Machine that Changed the World,” the first book that completely describes the thought process of Lean. Womack’s continued efforts over the past two decades since the book has been published have made Lean the most popular continuous improvement methodology available. In 2007, Industry Week published a survey among manufacturers that ranked Lean as the number one continuous improvement methodology, with 40.5% of respondents using Lean at their companies. Because these techniques apply to all processes, Lean continues to gain popularity as it spreads to other industries such as healthcare and financial services.

Lean thought processes inspire companies to look for improvements in ways that have often never been considered before. This is a reason such significant gains can be realized even in mature and what are thought to be highly efficient processes: Lean follows a process without respect to the functional organization of a company. It uses the neutral eyes of the customer to identify opportunities for improving a process, eliminating the well-meaning but costly localized improvements that benefit one department at the cost of another. Lean has a simple litmus test: If the activity is not adding value to the end customer, find a way to minimize or eliminate it to make product flow easily through production.

While Lean provides significant benefits for companies, it does not deliver these improvements by working employees harder. Since the industrial age began, competition between manufacturers has forced companies to continually find ways to take costs out of their processes. These efforts have often resulted in loss of jobs through automation in order to reduce labor costs, or a faster pace of work to increase throughput and shrink unit cost. In contrast, companies that practice Lean rely on their employees who know the process best to identify unproductive activities and replace them with productive ones. This additional productive time results in higher output with the same pace of production using the same capital equipment. For manufacturers looking to reduce unit cost, especially with limited capital investment, Lean can be the answer.

While companies understand the importance of people to the success of a Lean program, many companies approach their process from an inventory and equipment

perspective. This book will instead focus on the workforce and its interaction with the other resources required for production. We follow Graham, a production executive at a manufacturer who is challenged to reduce his company's product unit cost by 10% in a year. Along with Graham's story, we describe ideas, techniques and examples of how manufacturers have changed the way they manage the workforce and then standardize those changes through the use of technology. I hope that Graham's story and the techniques and examples we offer can help you gain similar benefits.

PLACING A VALUE ON THE WORKFORCE



The red light on Graham's Blackberry was blinking. It was just after eight in the evening and he had promised his family no email at night, but Graham knew the board of directors met today for what promised to be a tough meeting and he couldn't resist looking.

"Please stop by first thing in the morning – Spencer."

Getting a message like that from the CEO was not a good sign. Graham was responsible for operations and an offshore competitor had recently lowered pricing in the market by almost 10%. The loss of revenue due to that competitor taking market share had reduced earnings and the stock had dived last quarter.

The next morning Graham checked in with Spencer's assistant and walked into the CEO's office.

"Graham, I was given a choice yesterday: Reduce our unit costs by 10% or pack up the equipment and move this division to China. I need your help here. Do you think 10% is achievable? The board is serious about this. Investors are pressuring them to do something immediately to get the share price up. If we don't come back with a plan, we'll have to announce our intentions to shift production offshore.

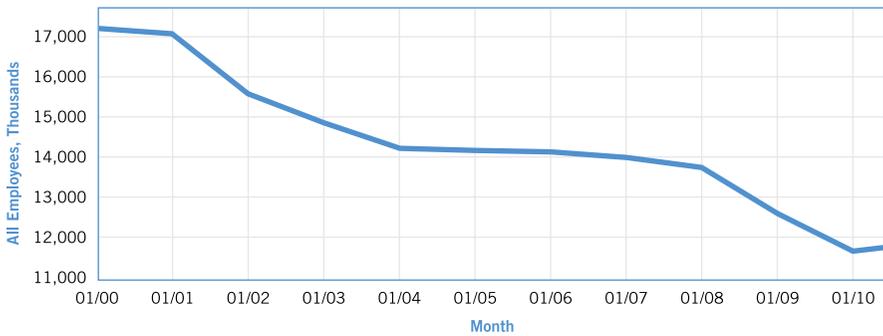
Graham's stomach started to churn. This was not the first time he'd been under pressure to reduce costs. The first couple of times weren't too bad. Two years ago the company had completed their strategic sourcing effort which had shaved 5% off material prices and cut inventories by 10%. Last year Graham had the painful task of cutting 10% out of the workforce. Employees were still grumbling about doing more work for the same pay level, but overall they had absorbed it. To go back again and reduce unit costs by 10% was going to be difficult. Even more difficult would be telling everyone their jobs would be moved offshore. Graham told Spencer he would find a way.

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The board wanted monthly updates, so Graham had to get started right away and begin showing progress soon. He sat down and started penciling out the drivers of unit cost.

Millions have lost jobs that have moved overseas from high labor cost countries in North America, Australasia and Europe.

Since 2000 more than 5 million manufacturing jobs have disappeared from the United States due to low wage competition and automation. In many industries the jobs have moved to countries where products, including shipping costs can be produced at a lower cost based on wages that are a fraction of those paid in the United States.



Source: Bureau of Labor Statistics

Manufacturing employment in the United States from 2000 to 2010.

But does an individual who works in China have any more security than an employee in the U.S.? As the cost of living rises in China, countries such as Bangladesh, who pay production employees half of what is paid in China, become the new low cost leaders.

But even manufacturers in Bangladesh are finding that competitive advantage based on low wages is not a sustainable strategy. In its article “*Bangladesh, With Low Pay, Moves In on China,*” The New York Times interviewed Anisul Huq, the former head of the Bangladeshi garment industry’s trade group and a factory owner. Commenting on a proposal from the government to increase the monthly wage from the current level of \$24, Huq predicts many apparel manufacturers in Bangladesh will go out of business within months if the minimum wage is doubled. Garment workers are demanding an even larger increase of three times the current minimum wage, which is what an experienced worker now earns.

For manufacturers in Bangladesh, the limited transportation infrastructure increases

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the cost of shipping. The lack of local suppliers requires importing expensive fabric. It's these higher costs that drive factory owners to push down wages to compete with other countries. These businesses have no control over building infrastructure but in a country with limited labor protections, they do have the ability to hire employees at very low wages and keep them depressed. For employees, a low wage job may be a better alternative to no job at all.

Staying globally competitive by driving wages down is not the only answer. In the article, Huq acknowledges that manufacturers in Vietnam are more efficient producers and can afford to pay better wages due to their higher levels of labor productivity. For all manufacturers, higher wages can be supported if productivity is increased.

While companies have limited control over their country's infrastructure or the supplier base, they do have the ability to improve productivity that in turn can support maintaining and even increasing wages. As demonstrated by manufacturers in Vietnam, an increase in labor productivity can eliminate the drive to find the lowest wage employees. These high productivity companies are also more resistant to outside forces such as governments legislating increases in the minimum wage or other employee benefits as was the case in Bangladesh soon after the New York Times article was published.

For most manufacturers this is not a revelation. There has always been a push to increase productivity within manufacturing. But even with those efforts to improve productivity, jobs continue to be lost to lower wage countries. What this trend points to is the larger challenge: While labor may be the most controllable resource for a manufacturer, it is also the most difficult to manage.

Resources such as machines and inventory are inanimate objects with well understood attributes. It's easy to calculate the benefit of reducing inventory in terms of improved cash flow or the return on investment by increasing throughput using automation. When it comes to labor however, the analysis becomes murky. There are many attributes that affect performance and as a result the return on investment is difficult to measure. Understanding the potential in an existing workforce, or in a workforce that is about to be acquired is almost impossible to predict.

For a company that depends on layers of supervisors and managers using manual processes to manage its workforce, the only consistent facts an executive has when it comes to the current value of their workforce is the company's unit labor cost. Similar to any other resource on the balance sheet, the workforce can be analyzed in fiscal terms; value of output divided by cost. There is a price to be paid for this simplification though; the workforce, unlike any other resource, has the ability to innovate and

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develop new ideas and processes. This value is not described in the general ledger and without additional facts, the value and potential of a workforce is difficult to measure.

The challenge in measuring the value of the workforce does not mean the workforce doesn't offer an opportunity for a company to increase its value. Because different companies manage their workforce with varying degrees of success there is variation on the financial return of an investment in the workforce. Those companies that effectively manage their workforce and the intellectual property (IP) the workforce creates will enjoy higher returns than competitors that don't effectively capture that potential. This return is not easily duplicated. A workforce based competitive advantage is far more valuable than any advantage based on a temporary gain from something available externally in the market. The reason for this is simple. Whoever is providing those external resources will see the value they are delivering and begin marketing those advantages to others. Internally developed intellectual property is much more difficult to duplicate because no one is selling it on the open market. This ability to innovate is a skill and as this skill is used, the workforce gets better at it, increasing the pace and impact of innovation. This workforce driven innovation is a sustainable competitive advantage.

While the workforce is regularly lauded as the most valuable resource within a company, it also holds a more dubious honor. The workforce is the most difficult resource to manage. Here's why:

- Their costs fluctuate without correlated changes in output.
- As a link in a supply chain where predictability translates directly into superior performance, employees are unpredictable.
- While substitutable, employees are not interchangeable.
- Companies are subject to new employee regulations from the government; generally adding cost.
- Turnover and retirement can make a valuable resource disappear overnight.

So while other assets such as machines and materials have predictable costs and performance, the workforce is highly variable in both cost and output. This range of performance presents an opportunity for manufacturers. Companies that reduce the variability of the workforce while still providing a fair and equitable place to work will receive more value from their workforce than those companies that do not. And

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while inventory costs can only go to zero and a machine can only achieve its theoretical limits of throughput, the new ideas and productivity gains achieved internally through workforce innovation never stop.

The challenge is that managers don't have the luxury of building a labor friendly environment and waiting for the innovation to occur. A company's investors know that the fruits of innovation will be reflected in the unit cost of the company's product or the successfully differentiated offerings that increase revenues. Customers are not patient either. They are buying current value: high quality, shorter lead times, lower unit cost and predictable delivery; not a promise of future excellence.

Graham wrote down the familiar formula for unit cost:

$$\text{Unit Cost} = \frac{\text{material} + \text{labor} + \text{overhead}}{\text{units produced}}$$

He promised himself to keep an open mind. Over the last couple of years his team had been using Lean techniques. Some of the results were amazing and others had not worked out.

Because of the time crunch, Graham made some simplifications to the numbers that represented unit cost.

Revenues = \$1,145,000,000

Material Costs = \$350,000,000

Direct Labor Costs = \$200,000,000

Overhead Costs = \$400,000,000

Units Produced = 500,000

Employees = 7,000

As he worked through the numbers, Graham started thinking about all the ideas that had been offered and then faded over the years. The proposed gains from many of these ideas seemed too small, the process changes were too big, or a department

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claimed it would be impacted negatively. For many different reasons these ideas had been shelved.

Graham understood that one of the fundamental advantages of Lean was that rather than focusing on working harder, Lean practitioners look for activities that don't add customer value. The big returns come when those activities are eliminated and the resources are directed toward producing things that customers do value. Recently a consultant came in to provide a seminar and he had offered a new spin on the traditional views of Lean. He suggested that companies had focused too heavily on three of the four M's (Machines, Man, Materials and Methods) of production. While Machines, Materials and Methods were important, too often the changes required of Man (this represents both women and men he explained) were driven by changes made to optimize the other three M's. As the most flexible of all the four M's, the activities of the workforce were designed to accommodate every other resource. If the process is truly changed for the better, this works fine. But when Methods, Materials and Machines are changed and not improved, those costs are not eliminated but rather transferred from the other three M's to Man.

The consultant described a situation where a company purchased lower quality materials from a supplier that still met engineering specifications. As a result the operators had to slow the machines down slightly to obtain high levels of quality. Labor hours per unit were up but the cause was hard to identify because while the material had degraded in quality, it was still within specification. The product designers had optimized the design specifications around functionality, not production cost.

There are many ways that different departments and suppliers lower their costs but really just transfer those costs to production labor. As these inadvertent "cost transfers" accumulate over time, the common denominator is that labor costs increase, negating true productivity gains. This can make it seem like labor costs are increasing while other areas are doing a good job in controlling their costs. As a result labor becomes a lightning rod for targeting cost reductions. Why track down and fix all the contributing factors of cost increases when it is easier to focus on reducing costs by moving the current production processes to a low-wage country and immediately reduce unit cost solely through labor savings?

The consultant had a different approach to this situation. He suggested that rather than trying to identify the contributing costs by looking at the machines, materials and processes, manufacturers should focus on labor to see how they are spending their time creating waste and track it back to the root cause. He called this approach Lean Labor. It was a unique approach because manufacturers always track labor care-

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fully when time is spent on value added activities such as production. But indirect labor and non-productive hours are where significant waste can occur, and are typically not measured as accurately.

By extending Lean concepts into Lean Labor, the traditional descriptions of Lean tools and techniques begin to evolve. For example, Taiichi Ohno, Toyota's chief engineer, created seven categories to describe how resources can be wasted. These have evolved into the Seven Wastes of Lean. By viewing these wastes from a workforce perspective, this description can expand to include workforce specific activities. Below is an example of the traditional description of the Seven Wastes of Lean with Lean Labor extensions bolded.

- Transport
 - The unnecessary movement of materials.
 - **Unnecessary movement of people such as call-ins.**
- Inventory
 - Excess inventory not directly required for current orders.
 - **More people than required for current orders.**
- Motion
 - Extra steps taken by employees because of inefficient layout.
 - **Manual paper processes that can be automated such as timekeeping.**
 - Requiring individuals to check information regularly rather than alerting them when action is required.
- Waiting
 - Unexpected delays that extend cycle time and cause the resources such as people and materials to wait unproductively.
 - Processes that build in waiting time. This wait often occurs due to a sub-process that must finish before the main process can start again.
 - Scheduling an individual who is not available due to vacation or previously working in another area.

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- **Unplanned absenteeism.**
- **Too few skills or experience to efficiently perform a process.**
- **Overproduction**
 - Making more of something than is required by current orders.
 - **Using a person too highly skilled (with corresponding higher pay) for a specific role.**
 - **Providing too much information to individuals, causing them to search through this detail for the information they require.**
- **Over Processing**
 - Time spent reworking a product or redoing a process.
 - **Entering data multiple times into different systems.**
 - **Decisions that are made, questioned and then reviewed again because of ambiguous supporting information.**
- **Defects**
 - Production that does not conform to expectation.
 - **Payment to employees that is not intended.**
 - **Expired or missing employee skills and certifications that cause quality and performance issues, safety hazards or regulatory infractions.**

Reviewing the notes he had taken during the consultant's seminar, Graham was a little skeptical that he would be able to achieve his goal through labor improvements. With an average unit cost of \$1,900, direct labor was only 21% of product cost when overhead was included. As he reviewed the consultant's list of wastes, some of the ideas generated within the company that had been previously suggested and discarded came to mind. Graham began listing these ideas, targeting each component of the unit cost, but this time with a focus on labor impact.

Materials

- *Reduce extra inventory required to buffer operations due to labor delays.*

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Labor

- *Eliminate errors in calculating payroll.*
- *Eliminate unnecessary labor hours.*
- *Reduce the unplanned or unknown absences.*
- *Improve the labor scheduling processes.*
- *Improve the ability to make decisions on the production floor.*
- *Improve the ability of individuals to react to daily production changes.*
- *Improve safety and compliance to reduce costs and lost time.*
- *Introduce flexible work hours to reduce premium pay.*

Overhead

- *Reduce the time supervisors spend on tracking labor.*
- *Apply Lean to processes outside of production.*

Units produced

- *Reduced labor related machine downtime.*

With Lean Labor a manufacturer doesn't have to possess the advantage of the lowest labor rate in its industry to remain competitive in a global market. The concept is simple: labor is only one of the resources required to manufacture a product. The other two are machines and materials, all combined through a proprietary process. Those companies that understand how to make that combination more productive will reduce their unit costs and lead times beyond a competitor who brings the solitary advantage of low cost labor.

Graham had so far focused on the benefits of Lean Labor as it applies to daily production. What he didn't factor in is one of the outcomes of Lean Labor is a workforce that enjoys an environment that is fair and equitable. It doesn't mean every employee is happy with every rule and its consequences. But knowing all the rules and applying them consistently and transparently means everyone has the same opportunities and this is a critical component of empowering a workforce.

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It was now the end of the day and Graham took a look at the list of ideas he had written down. The first one that struck him as an easy target was payments made in error to employees. He wasn't quite sure how big that could be, he had never had an error in his paycheck and the special checks and petty cash he approved were always for legitimate errors the company had made in calculating pay. But the idea came from payroll and admittedly, he hadn't thought much about it.

Graham made a call and set up a meeting the next morning with the director of payroll.