



Eliminating Waste in Supply Chains

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The roots of LEAN go back to Henry Ford in the early 20th century and the auto assembly lines in Highland Park, Michigan. Fast forward a few decades to post-World War II and Ford's philosophy to standardize processes became the basis of the Toyota Motor Company's approach to automate manufacturing steps and deliver products just in time.

Every day, companies across a wide range of industries use LEAN in their supply chain operations, in warehouses and distribution centers, finance departments, customer service centers and many other areas.

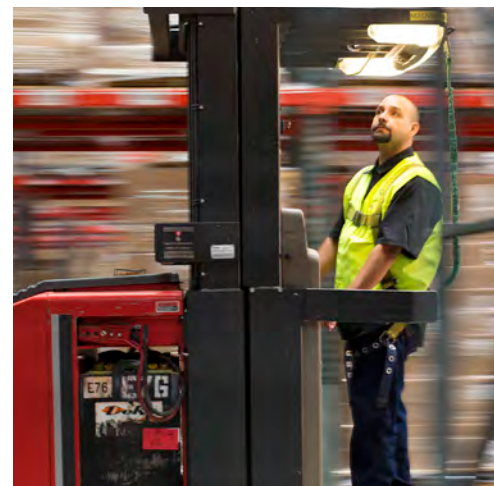
Consider these three dramatic examples of LEAN results:

1. By reducing 26 workbenches into six, an antenna manufacturing business reconfigured an awkward production process and workflow that was causing long lead times. The newly designed floor space greatly improved teamwork and collaboration, the lead times shortened and production capacity doubled.
2. At an automotive parts production plant, the 30 minutes of lost productivity time due to shift changes taking place three times a day was

proving costly. Using LEAN, a revised changeover process was implemented that minimized downtime and returned 90 minutes of up-time to the business and improved throughput by more than \$1 million annually.

3. Too much money tied up in inventory at an electronic devices company was jeopardizing its success. By focusing on each aspect of the ERP planning process, lead times and lot sizes were cut, inventory reduced and on-time delivery hit 100%.

In the supply chain arena, creating a LEAN culture offers tremendous opportunities for companies seeking continuous, incremental gains in quality and efficiency. And while becoming LEAN does not mean re-engineering entire operations, it does require a significant commitment in time and people.



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The key to delivering long-term customer value and outstanding business performance, quarter-after-quarter, year-after-year, is to implement a LEAN culture where every step in every process adds value for the customer. If it doesn't add value, it is eliminated.

Businesses that cultivate a LEAN culture report significant improvements in their operations. Because LEAN practices improve quality and productivity by taking cost and waste out of all facets of an operation, from the procurement of raw materials to the shipment of finished goods.

There are seven kinds of waste that can weaken your supply chain:

- 1. Overproduction:** processing material before it is required
- 2. Waiting:** people or product not moving
- 3. Transporting:** excessive movement and handling to get goods from one process to the next
- 4. Inappropriate processing:** using equipment that's more sophisticated and expensive than needed
- 5. Unnecessary inventory:** holding goods that are not flowing through any process
- 6. Unnecessary or excess motion:** allowing bending, stretching, walking, etc. that is not strictly needed to do the job and can jeopardize workers' health and safety
- 7. Defects:** allowing quality deficiencies that result in rework or scrap

To combat waste, a LEAN organization embraces the concept of Kaizen, or continuous improvement. Rather than implement ambitious programs to accomplish sweeping reforms, a LEAN operation makes incremental improvements consistently over time. These small changes add up to produce significant gains in both quality and operating performance.

This white paper speaks to the five principles of LEAN – providing insights about how they work together to eliminate waste in supply chains.

The five principles are:

- 1. People Involvement:** engaging every employee to root out waste, eliminate problems, and make improvements
- 2. Built-in Quality:** striving to prevent mistakes before they happen, never passing on a defect, and engineering processes to make them “mistake proof”
- 3. Standardization:** documenting best practices and making sure that they are followed
- 4. Short Lead Time:** filling customer orders as promptly as possible
- 5. Continuous Improvement:** understanding that no matter how well a process works, there is room to make it even better

1. People Involvement: The key to success

People involvement is the most important of the five LEAN guiding principles. Nothing happens in a company without people to drive it forward.

Employees must work as a single team, with everyone – from the CEO to the newest hire on the loading dock – pulling in the same direction. In a LEAN supply chain, people are the key component. Everyone must pull together to eliminate waste, reduce cost and provide greater value for customers.

When people are involved in a LEAN culture, it creates an atmosphere of mutual trust and respect. You have to cultivate an environment that's free of fear. People must know that they are valuable assets whose ideas are vital to the company's success and that they're welcome to point out problems and make suggestions for eliminating waste.

For example, if a forklift driver suggests a better route for moving pallets from point A to point B, and if new route makes the driver five percent more productive, the company should celebrate that success. If the driver tries the new route and discovers it makes no real difference, the supervisor should praise the effort and urge the driver to use lessons gained in the experiment to try to find a better solution.

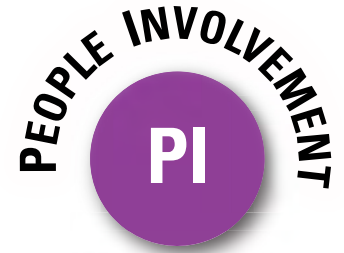
Supervisors also encourage employees to work in teams to solve problems and figure out more efficient ways of performing their

jobs. In addition, supervisors make sure their teams understand how their work contributes to the company's success.

At the start of each shift, employees meet briefly to share information and news. Warehouse workers might learn how many orders they'll be picking that day, what time various orders need to be loaded, which orders are especially critical and how well the company is doing on its key performance indicators (KPIs).

While the ultimate goal in a LEAN culture is to increase value for customers, it's only natural for an employee to ask, "What's in it for me?" Celebrating success is the way to motivate members of your team to keep doing their best. Simply thanking an employee for a great suggestion, especially in front of others, can be extremely effective. So can material rewards. You might present cash or gift cards to employees whose suggestions boost performance or save money. You might pay by the piece instead of by the hour, so a team that discovers more efficient ways to work has a chance to earn more money.

Sometimes visible tokens of success provide strong motivation. For example, every time a warehouse employee makes a successful suggestion, they receive a pin that goes on their safety vest. This tactic lets the employee proudly recount to others how they earned each one.



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EXAMPLES OF REWARDING EMPLOYEES

CELEBRATE
SUCCESS

RECOGNITION
IN FRONT OF
OTHERS

PAY BY THE
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FINANCIAL
REWARDS FOR
BEST IDEAS

2. Built-in Quality: Get it right the first time



“THE WAY TO ENSURE QUALITY IS TO PERFORM WORK CORRECTLY THE FIRST TIME. THAT MEANS BUILDING QUALITY INTO EVERY PROCESS.”

High quality in the production, transportation and distribution of products improves your bottom line. If employees always know where to find the product they need, goods flow smoothly from point A to point B. Orders can be filled correctly, completely and on-time, satisfying customer demand and saving time because there’s no need to correct mistakes. More importantly, your efficiency often allows you to take advantage of low-cost transportation options. The way to ensure quality is to perform work correctly the first time. That means building quality into every process.

A company should engineer its supply chain processes with its workers in mind. Any worker should be able to perform processes perfectly to meet the requirements of customers and other stakeholders, such as regulatory agencies. Once the engineering team designs a process, they conduct a Failure Mode and Effects Analysis (FMEA)—a trial run in which someone tries on purpose to “break” the process. By locating weak points where mistakes might occur, the engineers are able to bring the process even closer to perfection.

Next, the design team decides which metrics it will use to determine whether the process is meeting its requirements. Then it documents the standards and creates simple how-to instructions using photographs to illustrate each step for employees.

When a LEAN business opens a new supply chain facility, it follows the procedures described above to create and document each process the workers will perform. Then, the team monitors operations for 90 days to ensure the processes are working as

expected. Once the processes are validated, the facility receives a “Steady State” certification.

When a mistake slips past the safeguards, you need to dig down to get to the root of the problem. The goal is to mistake-proof the process by ensuring that the error never has a chance to recur.

Consider an example of a truckload of disposable gloves arriving at a warehouse unexpectedly. The warehouse doesn’t have enough room for all the extra inventory, so the excess is placed in an aisle where it obstructs workers trying to fulfill orders for other items in the aisle. The gloves are moved several times to reach adjacent items, causing waste and contributing to lower productivity rates.

Using the “5 Whys” helps employees investigate what happened:

Why #1: Why did the disposable gloves move so many times? It was placed in the middle of the aisle.

Why #2: Why was it placed in the middle of the aisle? The shelving location where it belonged was full and there was no additional space to put it.

Why #3: Why was the shelving location full? Because there was an oversupply of disposable gloves beyond what the bin space allocated.

Why #4: Why was there an oversupply? A full truckload of gloves arrived unexpectedly yesterday.

Why #5: Why did a full truckload of gloves arrive unexpectedly? A person in sourcing got a highly discounted price and decided to order excess, not knowing we didn’t have space for it in the warehouse.

3. Standardization: The best way is the only way

In a LEAN facility, everyone is trained and expected to follow documented best practices. The company documents these tasks and trains the employees who perform them to follow best practices. No matter who executes a process, the steps they follow should be the same.

Standardization offers several advantages. It allows companies to easily calculate how much time and how many resources are needed to complete work. When work is standardized, every employee is the best and fastest.

Also, standardization provides the foundation for continuous improvement. Consider 'John' who suggests a better way to stack cartons inside a trailer. The new technique speeds the loading process by eight minutes per truckload. If each person on the dock uses his or her own techniques to load a trailer, John's suggestion will improve only John's work. If everyone follows a standard procedure, the company will save eight minutes every time any employee loads a trailer. Standardization multiplies improvements.

Standardization involves five elements:

- 1. Visual management:** Signs, symbols, color codes and other visual tools make a facility "talk" to the people who work there. They keep people informed about how to do their work, how work is progressing, where tools are located and other conditions important to the task at hand.
- 2. Layered audits:** A layered audit ensures that employees perform their work according to the established standard. The key to a layered audit is to perform it while the work is in progress, not after the work is complete, to allow for

immediate corrections. Layered audits occur on a regular schedule, using standard work documents.

- 3. Management by customer demand:** A LEAN operation doesn't become more productive by pushing people to work harder and harder. Instead, it tailors its resources and sets a steady pace to produce exactly what customers need each day.

- 4. Standard work:** This is a written description of the only acceptable way to perform a particular task. Although the company expects to make continual improvements on this method, the procedure in the document is the safest, best and most efficient way currently known to do the task. The description includes the time it should take to perform the task.

The principle of standardization maintains that all work follows established, well-tested procedures. Management provides clear instructions for performing every task and creates schedules and physical facilities that help work flow smoothly.

- 5. Workplace organization:** Just as there is one acceptable method for performing a task, there should be one standard method for organizing the materials and tools in a work space. The goal is to identify a place for everything in its place. When items are not in their defined place, employees waste time searching for the needed item.



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4. Short Lead Time: Keep it moving

Lead time is the period that elapses from the moment a customer places an order until that customer receives the goods – the shorter the period, the LEANer the supply chain. When lead time is short, companies don’t tie up cash in safety stock or build extra days into production or distribution cycles. Instead, they rely on a steady flow of inventory to arrive exactly when it’s needed and they can plan their business processes accordingly.

A LEAN organization reduces lead time by streamlining its work as much as possible and eliminates steps that don’t add value for the customer. Minutes saved in multiple steps adds up to significant savings in time and ultimately money. A strong LEAN organization designs its facilities to keep work flowing without impediment or waste.

To achieve an efficient flow, a business must continually strive to take steps out of every process. That’s why a simple process flow starts with facility design. The design of a warehouse should allow material to move from point A to point B with minimal handling.

For example, fast moving product is stored on the floor, so pickers don’t spend time retrieving it from slots on higher levels. Similarly, products in high demand are positioned close to the loading docks so workers need to only travel short distances to get it out the door.

Also, breaking big jobs into smaller units helps employees to work more efficiently. Consider an employee who is assigned a picking job that is expected to take two hours. The picking might move quickly for the first hour and then slows down as the employee’s mind wanders. No one keeps track of the pace or quality of the work. The job ends up taking two hours and 15 minutes.

Now consider what happens when you break that two hour job into smaller lots. The team leader asks the employee to bring a specific amount of product to the loading dock every 20 minutes and indicates on a white board each time a task is complete. Now, the employee is responsible for meeting a goal three times in 60 minutes. The employee meets that goal six times and the job takes exactly 120 minutes – eliminating 15 minutes worth of waste.

If these 20 minute work assignments can be given to six different workers, the customer order can be completed in 20 minutes versus two hours.

5. Continuous Improvement: Step-by-step

In a LEAN facility, each employee looks for ways to remove waste and improve quality. That on-going stream of small gains is called continuous improvement.

Continuous improvement is based on the idea that it is more effective to make many small gains over time than to try to accomplish massive gains all at once. Not everyone can climb Mount Everest, but nearly anyone can take a single step up a mountain trail. In the same way, anyone can learn to shave one minute from the time it takes to unload a trailer, or to walk from aisle 3 to aisle 12 in a warehouse. Continue to make those small improvements, and eventually you will scale the mountain.

Problem solving for continuous improvement is a structured practice for identifying a problem, analyzing its root causes and implementing solutions to resolve the problem in order to keep it from occurring again.

LEAN philosophy offers many tools for eliminating problems. One is the problem solving jacket – a simple folder that outlines a series of steps required to identify the root cause of the problem and to develop correction actions to prevent the waste from reoccurring. Yet another is the A3 process, a discipline that keeps the discussion of a problem clear and simple enough to diagram it on a single sheet of paper. Both the problem solving jacket and A3 process follow the LEAN PDCA (Plan, Do, Check and Act) methodology.

A company can apply any of these tools toward the same goal— defining the root causes of a problem. The crucial part of this exercise is to state the cause simply, focusing precisely on the process that is creating waste.

LEAN TOOLS FOR CONTINUOUS IMPROVEMENT	
PLAN-DO-CHECK-ACT (PDCA)	A3
TEAM PROBLEM SOLVING	EMPLOYEE SUGGESTION SYSTEM

The continuous improvement process is woven deeply into the culture of a LEAN operation. Every employee is trained to identify and root out waste, and devoted to sustaining previous improvements. Employees are ambitious in their efforts to improve performance in order to support customers’ needs and help maintain their own job security. They are always suggesting innovative ideas, and even if an idea doesn’t work, they are encouraged to keep exploring new ways.



“IT’S MORE EFFECTIVE TO MAKE MANY SMALL GAINS OVER TIME THAN TO TRY TO ACCOMPLISH MASSIVE GAINS ALL AT ONCE.”



Conclusion

The LEAN culture offer tremendous rewards for any company’s supply chain. It does, however, require a strong, long-term commitment to a LEAN transformation strategy. Fortunately, the right third-party logistics partner can offer deep expertise on how to deploy a LEAN strategy to transform your supply chain operation with continuous, incremental gains in quality and efficiency.

Ryder has managed supply chains for Toyota for more than 30 years, as well as other companies across varied industries, and has implemented these five LEAN guiding principles to govern every activity in its own and customers’ warehouses. That’s why Ryder has become a leader in LEAN supply chain solutions.

Once again, the principles of LEAN are:

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To learn more about how LEAN can transform your operation, visit ryder.com/lean or call us at 1-888-887-9337

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