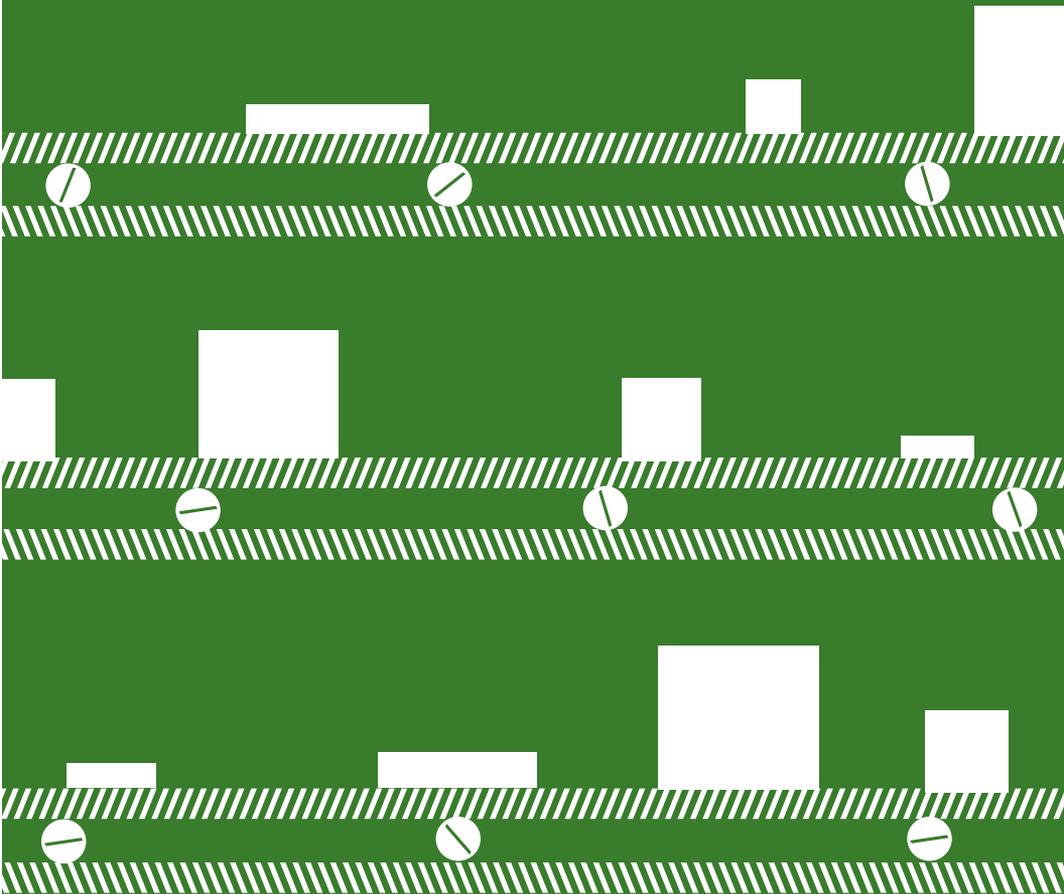


THINK LEAN

for profitability
and sustainability



What exactly is lean? Lean has been defined as “a systematic approach to identifying and eliminating waste through continuous improvement, flowing the product at the pull of the customer in pursuit of perfection.” First of all, according to this definition, the approach to becoming lean should be systematic. To benefit from lean practices, a company would need to begin with an overall strategy and apply it in the correct order. Secondly, the lean strategy should focus on eliminating waste. Waste can be eliminated through inefficient processes including transportation, production delays, inventory, defective products and ineffective activities. Last of all, while absolute perfection will probably never be realized, each step to achieving continuous improvement will increase a company’s profitability and potential.

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Manufacturers need to stay focused on finding new ways to design, produce, sell and deliver their products. Due to lower employment numbers and profits, many companies have begun implementing lean manufacturing methods to gain a better position in the industry. Pressures from foreign competition have also encouraged many American manufacturers to adopt lean manufacturing processes. While simple lean logic is the idea that excess inventory is a waste, many companies implement lean more slowly than they really should, simply because they lack the measurements and tools to verify that lean is actually working.

Why would anyone waste materials?

Why would anyone waste space to store excess inventory?

Henry Ford defined the lean concept simply: "We will not put into our establishment anything that is useless." Types of waste can include excess inventory, overproduction, waiting time, transportation, costs of quality (scrap, rework and inspection), and other non-value adding processes. Not all manufacturers are the same and needs are dictated by specific products and functions. While lean seeks to reduce and eliminate non-value business activities, it gives an overall competitive advantage by lowering operating costs while improving productivity. Here are

some basic principles of lean that must be understood before a company can begin building lean strategies:

Understand Customer Values

A company must be able to identify and establish values that are externally focused on what customers believe are important. Keep in mind that environmental and sustainability goals such as reduction of waste and use of renewable energy also serve customer interests—being lean and green could help a company reach its customers more effectively. Long-term success can only be achieved through customer satisfaction.

Value Stream Analysis

Steps in the business process have to be analyzed to determine which ones actually add value. If measurements aren't taken, then it is difficult for goals and improvements to be obtained. If a step does not add value, the company should either change the step or consider removing it from the process altogether. If there is a key success factor that is not acknowledged or tracked, it may as well not exist.

Measurements of added value should be in place to indicate not only financial success—profits, market

shares, and earnings growth—but also performance excellence such as response time to market, customer satisfaction, and outstanding processes for quality and timeliness, mechanisms that ensure learning, growth and continual improvement, and employee satisfaction. These measurements should always result in values that can be tracked, managed and improved. The non-financial measurements indicate whether the elements of success are in place—responsive time-to-market, a loyal customer base, processes that demonstrate quality and timeliness, and methods that determine learning, growth and continuous improvement.

Performance quality measurements take inputs from labor, marketplace requirements, operating funds, raw materials, and supplies and determine how effectively they are converted to outputs that are valuable to customers.

Supplier performance measurements determine the impact of overall costs of transactions, communication, problem solving and having to use multiple suppliers for the same raw materials and components. Suppliers may be substituted when one runs out of stock or when materials may be purchased at a reduced price. In addition, supplier

inventory levels and delivery times can affect the supply chain performance.

Flow

Production should flow continuously from one work station to the next, beginning with raw materials and ending with the finished product. Employee involvement and teamwork, measuring and organizing processes, and reducing variation, defects and cycle times are all important methods of continuous improvement in production flow that involve an ongoing company-wide effort.

“...eliminate steps that do not add value and improve the efficiency of those that do.”

Pull

Pull should be based on customer demand rather than stockpiling inventory. Transferring to a pull-based schedule typically requires that managers ditch systems that utilize push-based scheduling, something few manufacturers are willing to do. This process can also be viewed as the “value chain” where each activity or step contributes to the end result. The entire group of activities in the

process should be organized to work together to transform one or more kinds of input into outputs that are valuable to customers. Inputs such as the employee's work, marketplace requirements, operating funds, raw materials and supplies should also be converted quickly to outputs. The challenges managers face are to eliminate steps that do not add value and improve the efficiency of those that do.

The cost of quality increases each time work is redone. This includes reworking the manufactured products, retesting an assembly item and the rebuilding of a tool. Prevention costs are designed to prevent poor planning, insufficient supplier capability and underestimated process capability. Failure costs result in products that do not conform to company requirements or customer needs. Internal failure costs happen when timely product delivery to the customer fails. External failure costs occur during or after furnishing the product to a customer—customer complaints, customer returns, warranty claims and product recalls. In other words, the cost of quality is an expense that would not have occurred if the total quality of the product were accurate—or done to perfection. Companies should constantly improve processes for planning, production and service.

Perfection

By eliminating waste from the production process, the product begins to continuously flow according to customer demands and noticeable results should include reduction of time, cost, space, errors and efforts. Managers need to define a standard of problem solving so that the process can be reviewed and evaluated and solutions can be easily implemented. The fact that we can strive for perfection but never achieve it makes it possible for improvement and progress. But in setting a standard of perfection, remember that perfection is synonymous with excellence and excellent quality results from perfectly processing the perfect thing, in the perfect way.

Taking a Lean Stance

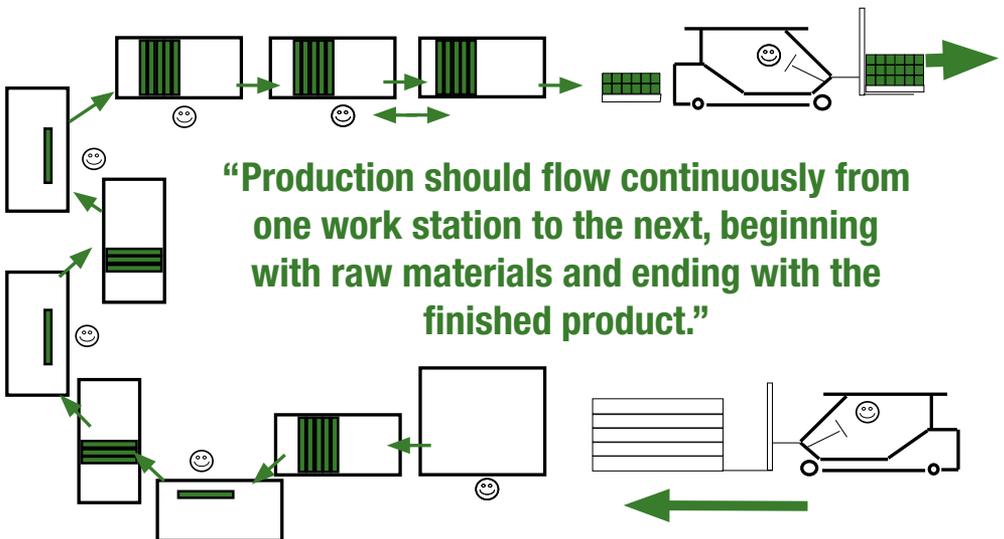
Lean principles consist mainly of customer driven values and working together in managing waste elimination and opportunities for improvement. Lean aims to maximize a company's overall performance system from concept to delivery. With lean practices, inventory is produced in small quantities and pulled as needed. Pull systems rely on a central control source to move the resources based on a plan that is maintained throughout the workforce. Production results will then show a reduction in its work-in-process.

Peavey International is an example of one company that has embraced a company-wide lean initiative. Peavey expects to maximize efficiency among its 33 facilities and strengthen its global position by applying efficient skills, freeing up needed resources, and ultimately becoming more competitive by applying lean techniques to the company's workflow and processes.

A McKinsey Quarterly report in 2007 described an evolving level of management and operational competency in China. One of the aspects was that multinational companies were taking best practices, including lean manufacturing, to China. The McKinsey study of 30 multinational-owned factories in China also showed that waste-reduced profits in China had increased from 20 to 40 percent by using lean processes.

Although waste can seem to be common in most manufacturing plants because of employee mind-sets and manufacturing approaches such as inefficient distribution networks and under-leveraged production processes, approaches to lean operations emphasizing high performance standards and operating precision can transform a company's success. Managers will too often focus on growth instead of operational improvements when a business is growing and the profits are good. Successful companies will rethink their strategies, their organizational goals, and their operations. This means learning to recognize and adopt best practices that will keep the business alive in the face of a global struggle.

Manufacturers must also remember that maintaining a competitive position is



about being able to satisfy demanding customers. The customers are clearly in charge. Leading manufacturers have learned how to respond to last minute configuration changes without additional lead times to fulfill an order. In most cases, this requires a culture change within the organization. Edgar Schein defines organizational culture as “A pattern of shared basic assumptions —to be taught as the correct way to perceive, think and feel” and is the most difficult attribute to change. Success is progressively more about how well a business works, how fast it can act and its ability to perform in the face of today's challenges. Meeting head-on with the frequent and unexpected changes in supply, demand, capacity and product engineering, establishing a competent system that enables supply chain agility and operations performance is the key to success where problems can be complex, where change is constant, and time matters.

A standard of problem solving must be defined so that leadership can effectively guide others when difficulties do arise. For leadership to occur, leaders must communicate the vision to others in such a way that the vision is adopted as their own, and thus promotes continuous improvement. Continuous improvement is an ongoing effort to improve products,

services and processes. Managers must plan for changes, implement changes, analyze results of changes, and continuously assess the results of the change to determine whether it can be implemented on a wider scale. Managers must also learn to focus on the warning indicators of problems, recognize setbacks when they occur, evaluate the possible impact, and quickly identify solutions. A road map of alternative solutions should be available and, in the end, the desired results should be achieved by highly-trained and skilled problem solvers. Feedback must be built into the implementation of solutions to develop effective monitoring and analysis of actual processes and to align them with company expectations.

Companies should also consider a system that allows them to predict the effect of changes in demand on operating capacities and workloads. In many cases a gradual transition to an informal or matrix type organizational structure will enhance the ability to respond. Additionally, these types of organizational structures will promote decision making, increase responsibility and facilitate cooperation with information technology systems to effect expedient response times. With the help of information technology systems and software, orders can be released at a level pace that will

not swamp production resources. In helping to shorten lead times and improve on-time delivery, an effective information technology planning system can support lean by configuring the manufacturing plant properly with tools such as process optimization technology, simulation programs, plant layout, automated production equipment and creating improved lines in operation.

Strategic management tools should be in place to set product and process standards, to develop value-added measurements and to collect and analyze organizational performance. Customer satisfaction, business approaches and ongoing improvement strategies create the future value of companies with their customers, their suppliers, their employees, and their technological and innovative processes. At the end of the day, coping with complexity and change comes down to a sequence of tradeoffs and compromises that should be determined by the best information available. With the right technologies and tools, significant breakthroughs in operating performance and customer service can determine a company's profit margins.

Lean and Green Trends

Industry pioneers in the eco-movement are being joined each year by newcomers who dedicate their resources to the planet preservation cause and offer more earth-friendly product options. This is the perfect opportunity for companies to position themselves in being "green" and saving the planet while being "lean" and saving customers and their business money. Thanks to globalization, rapid advances in technology, and the green movement, the manufacturing environment must stay focused on finding new ways to design, produce, sell and deliver products that are cost effective while being socially responsible. By focusing on the elimination of environmental waste through the use of lean processes, companies using lean techniques to achieve environmental sustainability should profit from finding ways that improve their bottom line along with their overall health and sustainability.

**“...combining lean and green
can benefit the company's
bottom line...”**

A lean company uses processes that are as efficient as possible to reduce their costs. A green company uses processes that are as efficient as possible to increase their environmentally-friendly benefits. Leaders everywhere are focused on an organizational structure that incorporates continuous improvement resulting in approaches that are faster, better and less expensive. Because businesses are accustomed to treating environmental practices as a source of added costs, the challenge is to identify where environmental and sustainability quality issues, such as use of renewable energy, fewer chemicals, and the reduction of waste, will also support business and customer interests. Lean and green companies aim at eliminating waste in every area including customer service, product design, supplier networks and plant management. By using less employee effort, less inventory, less time to develop products and less space to respond to customer demands, lean companies are able to produce high quality products in the most efficient and cost-effective manner possible.

Of course, both lean and green must be thought of for the long term. Companies must find solutions for both short-term and long-term effects on social responsibility, environmental

performance, eliminating waste through continuous improvement, and favorable business results. Searching for best practices and establishing the best possible industry processes that are lean and green will lead to superior performance and company profitability.

McClarin Plastics has been using lean manufacturing since 2000 and regularly realizes green benefits through waste reduction, energy conservation and space allocation, and to no surprise, has seen their cash flow multiply. Through lean practices, they have freed up 30,000 square feet of warehouse space and utilized it as production space for just-in-time raw materials that are delivered directly to their plant. They have eliminated the need for warehouse expansion; thereby conserving land and resources, as well as reducing man hours and energy needed to transfer components from one work area to the next.

With a focus on waste, companies can create a bridge to lean and green to be adopted by all employees on a daily basis. One way to accomplish this is through recycling—energy, water, materials, etc. By using environmentally-friendly materials in products and packaging, a company can also minimize costs of energy and resources. Think about it. When

a company becomes more energy efficient, it becomes greener. If the company is cutting costs by becoming more efficient, it becomes leaner. In the end, combining lean and green can benefit the company's bottom line, creating a more efficient and environmentally-conscious organization that will benefit everyone in the company from the top down.

References:

Womack, et al., The Machine That Changed the World, 1990

www.peavey.com/new/article.cfm/action/view/id/404/cat/2/article.cfm

www.mcclarinplastics.com

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