

INCREASING PERFORMANCE,
DELIVERY TIME AND PROFITABILITY
THROUGH
FACTORY FLOOR INNOVATION

LEAN MANUFACTURING



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The term is more than a buzzword of the decade. It is the key to improving your company's floor performance, customer responsiveness and, ultimately, the bottom line.

Yet, manufacturers still misunderstand what it takes to implement this concept.

Lean Manufacturing can mesh today's information technology with older concepts of Toyota's much-lauded Just-In-Time (JIT).

By being creative, manufacturers have the opportunity to take advantage of computer systems not available to Toyota back then.

The Beginnings of Lean Manufacturing

The roots of Lean Manufacturing can be traced back to the Toyota Motor Company, which developed the Toyota Production System during the 1950s. The assembly-line manufacturing methodology professed the importance of “getting the right things to the right place at the right time, the first time, while minimizing waste and being open to change.”

Some Common Mistakes and Misconceptions

Today, many managers talk about moving towards Lean Manufacturing with too little knowledge of the overall concept and goal. In trying to implement the process, many American manufacturers have been disappointed by inadequate results while others have found the process too disruptive. Still, others believe they are adhering to the principles of Lean Manufacturing but lack the control to improve the process and, therefore, may actually be costing themselves more money in the long run.

Moving Towards Lean

What can your company do to make the correct moves towards Lean Manufacturing? One of the obvious, but often overlooked tools, is information from an electronic floor system. A floor information system can help manufacturers move forward with Lean concepts of identifying problems, following the flow of parts and measuring changeover times. Today's American manufacturing company has the opportunity to improve on Lean concepts with information systems that can be married into a Lean process improvement program.

With information systems, the analysis of the factory floor processes and the flow of parts, sometimes referred to as a “current state map”, are visibly tracked throughout production. If a company is going to take action to improve the manufacturing process, then why not make the flow process visible and available *all day to all of the employees*? Therefore, improvement will be continuous...an ongoing goal for both the management and the floor workers.

Real Time Alerts to Downtime

The need to be alerted to problems in production in real time is what's really important. One of the most widely documented approaches to improving the process at Toyota was the stopping of the production line when problems occurred. This alerted management to the problem the moment it happened. The workers and management, in a team concept of creative thinking called, “soikufu”, then analyzed the cause of the problem. However, stopping production is not necessary, identifying the problem is.

The ultimate goal is to implement a floor information system that can make factory floor activities highly visible, so improvement opportunities are easily seen. It is important for a floor information system to be able to do the following:

- 1 **Make sure that all the employees on the floor have some level of interaction with the system and use it daily.**
- 2 **Allow the system to provide a JIT (Just-In-Time) production schedule which is dynamic and reactive to customer and floor demands.**
- 3 **Find a way to record changeover times tracked to specific assets and people.**
- 4 **Identify the opportunities for process improvement and keep a record of it.**
- 5 **Allow the floor personnel access to better communications like messaging where appropriate.**
- 6 **Improve the operators access to data by providing electronic "paperless" display of current, as well as, newer style electronic image and video documents.**
- 7 **Make the quality checks part of the process and capture it electronically so alert conditions of non-conformance conditions can be captured in real-time.**

Creative Thinking

If your company wants to be leaner in the production process, you need to make sure you evaluate all the alternatives, which can be a catalyst to becoming more lean. It is important for managers to think creatively and use the information tools creatively. Top level executives can be instrumental in creating a culture for continuous improvement. Empower all floor workers, as well as managers and executives, to utilize information provided by information systems, implement creative problem solving and share in the success of meeting greater production goals. This is the key to the success of the Lean Manufacturing process!

A “Lean” Perspective on Some Common Terminology

Flow Manufacturing

A manufacturing methodology that moves items through a synchronized manufacturing process. The principle goal is faster response to customer demand.

The operative words in this definition are “faster response to the customer demand”. Putting a floor system in place that allows the company to coordinate the manufacturing of parts in various operational steps, tied to an estimated due date and tracked on a shift basis can easily accomplish flow.

An easy to use, visual system that can quickly sequence parts on the floor can be very useful in this area. These systems provide a prioritized line-up based on operational production times and they do not need to be overly expensive or difficult to use to be valuable. Simple but realistic is the best approach.

Value Stream Mapping

A process to determine the value added to a product as it goes through a manufacturing process.

Tracking the “value-added” piece of the process simply requires that a manufacturer track the flow time for each part that travels the floor. The newer paperless floor system is able to accomplish this.

Muda

Anything that interrupts the flow of products and services through the value stream and out to the customer is designated muda - or waste.

In order to find out what has interrupted the flow, there must first be a flow to interrupt. Electronic scheduling of the flow is often most useful in an environment in which customer demand fluctuates or product mix is variable. Buying additional floor assets to try to smooth the pace might be costly, disruptive and a waste of time and resources.

Andon Board

A visual control device in a production area to keep track of the pace of production and alert the factory to any unexpected changes in flow of the product.

Once again, having a predetermined flow schedule provides a basis of comparison. In a flow of product that has a mix of parts, manufacturing time at each operation may vary with each different part. However, having a standard time that is tracked in real-time as the parts are produced is important information.

Be sure two things are visible:

- The pace for each part at each operation as it is produced. This pace should be shown to the operator(s), which is called real-time efficiency or rate (TAKT time) tracking.
- Immediate alerts to unexpected changes in flow. These alerts might be an abnormal efficiency, a downtime condition or non-conformance to quality specs.

Kaizen

Japanese for incremental improvement in the flow of product and the value-added in the product.

Incremental improvement in the flow can best be determined when the flow of the parts is evaluated in timing measurements. These metrics identify areas of concern and focus on bottleneck conditions, downtime causes, set-up time reductions and better design of product flow. The visualization of the flow (or lack of it) can be accomplished as a by-product of sequencing the flow and tracking the flow in real-time for each part. Simple, easy-to-use, intuitive and well-designed factory floor systems are a natural fit for this environment.

The blending of Lean Manufacturing concepts with today’s information tools is the frontier of process improvement. Manufacturing companies today need to make sure they’re aware of the cutting edge technology available, make sure top-level executives and management think creatively and make improvements in their manufacturing process that are simple to implement and use every work day.

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FACTIVITY INC.

23400 Mercantile Road, STE 1A

Beachwood, OH 44122

www.factivity.com

800.369.6377

