

## The Roots of Lean Manufacturing

*The genesis of Lean can be traced back to the late 1800s and early 1900s.*

The central idea of flow that everything should flow from raw material to the customer came directly from Henry Ford. Ford, a pioneer in continuous flow, authored a book published in 1926 entitled, *Today and Tomorrow* in which he outlined his vision of production and of delivering value to the customer. The following quote from page 112 exemplifies his philosophy on waste:

Ordinarily, money put into raw materials or into finished stock is thought of as live money. It is money in the business, it is true, but having stock of raw material or finished goods in excess of requirements is waste which, like every other waste, turns up in high prices and low wages.

While the evolution of Lean thinking owes much to the genius of individuals the world over, its origins are unmistakably steeped in U.S. history. As Lean continues to gain prominence in your company and others across the country, be proud Lean is as American as apple pie.

### What Is Lean?

*If it doesnt add value, its waste. This quote, uttered nearly a century ago, was made by Henry Ford. By all accounts the first truly Lean thinker, he understood that waste presents a major barrier to a firms ability to satisfy customers.*

Customers expect variety, reasonable price, high quality, comprehensive service and responsive delivery. A major challenge facing all modern firms is how to attain the speed and low cost of high-volume flow while retaining the flexibility and customization potential of a low-volume job shop all within a culture of continuous improvement.

Lean principles merges the best features of large-scale production (high volume at an affordable price) with the best features of craft production (customizable products with perfect quality). This amalgamation defines a way of thinking about production: the economic producer of diverse, innovative products of consistent high quality.

By abhorring waste and cherishing the strategic importance of continuous flow, Lean is an extremely efficient, systemic approach to delivering what the customer desires most: value.

### The Language of Lean

*Understanding key terms forms a foundation for Lean learning.*

Value is defined in each case by the customer and is created when a specific capability is provided to him at the right time at an appropriate price. Value-added means some kind of processing (done correctly the first time) that changes (transforms) the shape or character (fit, form or function) of a product or service.

· Non-Value-added activities are those tasks that have to be done given present working conditions or processes, but dont add value to the product or service. The desire is to either minimize these activities or introduce process improvements that would eliminate them entirely. Waste includes needless activities that must be eliminated immediately. Waste consumes resources without value. A value stream is the properly sequenced, irreducible number of steps a product or service must undergo during its transformation.

Flow reflects the state of continuous, progressive adding of value devoid of detours, backflows and interruptions. Flow is present if people are always working on the "product" and the product is always being worked on.

Where Lean Thoughts can become Reality

*"Unless you try to do something beyond what you have already mastered, you will never grow."*

Ronald. E. Osborn

## *The Roots of Lean Manufacturing*

### **Value: Because Customers Have Choices**

*In the often high-tech and complex arena of business, powerful counter-productive forces are constantly working in concert to impede and inhibit the smooth, regular flow of the product.*

Satisfying the customer is the most important goal of any business. In a global economy, this truism translates into the ability to provide the best value viewing the whole product through the eyes of the customer to meet his needs at a particular price at a specific time.

By design, Lean enables a superior quality focus, collapses the white space within production processes to accelerate delivery times and drive declining costs, and provides innovative service to customers.

### **Lean Thinking**

*Lean thinking embodies key paradigms and presents an alternate perspective of production.*

**Think horizontally.** Its not how many parts are machined or assembled (or how many purchase orders processed) by one worker or department, but how many quality "parts" are completed on time by the production line as a whole. By focusing on flow, you correctly prioritize process efficiency over operator efficiency.

**Invert time measures.** Think of production in terms of time interval, not rate. Instead of 60 mph, think of a one-minute mile. Instead of four aircraft a month, think of a five-day aircraft. In this way, you begin to understand the importance of speed.

**Problems are good.** Repeat problems are bad. Lean forces problems to be discovered by you and not your customer. Problems brought to the surface are a positive indication that the system is working. Getting value to flow faster always exposes hidden waste in the value stream. The harder you pull, the more impediments to flow are revealed so they too can be removed. Change will be gradual, even though the pain of exercising long-neglected problem-solving muscles may be felt immediately. But pain in this context is good. The more those tight, once-ignored areas are flexed, the stronger and more effective they will become.

**Dont confuse value with cost.** In this age of intense competition, companies cannot adhere to the attitude that price is equal to cost plus profit. Today, value-conscious consumers offer only one source of profit: lowering the cost as much as possible. Lean thinking forces you to constantly ask, What would the cost of this product be if it was totally waste-free?

### **Becoming Lean: Embarking on a Journey**

*In the often high-tech and complex arena of business, powerful counter-productive forces are constantly working in concert to impede and inhibit the smooth, regular flow of the product.*

For a company to consider it Lean, waste must be sought, arrested and eradicated. This is the basic condition. But whether its the unpredictable dynamics of human interaction or simply Murphy's Law, the fact remains that the natural order of things in a business environment is never Lean.

The first order of business in becoming Lean is to know thy enemy. With thousands of workers and production orders and millions of parts and square feet, the factory floor and office area is by nature a veritable minefield of delays and disruptions. Because of these natural barriers and obstacles, flow is unsurprisingly jumbled if not often completely stagnant.

***A Lean journey begins with an ability to recognize waste and a full comprehension of its causes.***

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