

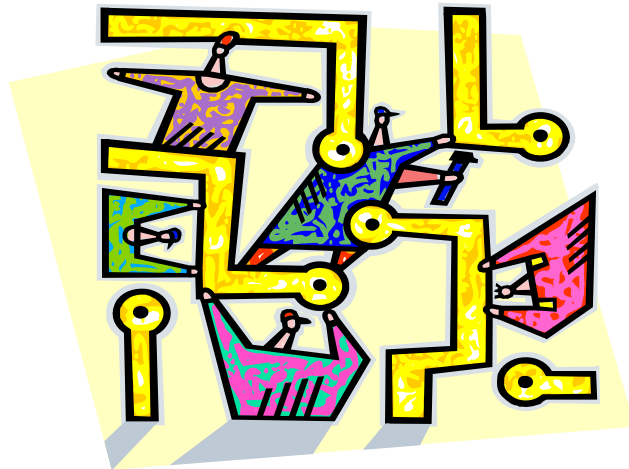


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## **Lean Improvement Methodologies**



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### **Lean Improvement Methodologies**

#### **A Brief History of Lean**

U.S. manufacturers have always searched for efficiency strategies that help reduce costs, improve output, establish competitive position, and increase market share. Early process oriented, mass production manufacturing methods common before World War II shifted afterwards to the results-oriented, output-focused, production systems that control most of today's manufacturing businesses.

Japanese manufacturers re-building after the Second World War were facing declining human, material, and financial resources. The problems they faced in manufacturing were vastly different from their Western counterparts. These circumstances led to the development of new, lower cost, manufacturing practices. Early Japanese leaders such as the Toyota Motor Company's Eiji Toyoda, Taiichi Ohno, and Shigeo Shingo developed a disciplined, process-focused production system now known as the "Toyota Production System", or "lean production." The objective of this system was to minimize the consumption of resources that added no value to a product.

The "lean manufacturing" concept was popularized in American factories in large part by the Massachusetts Institute of Technology study of the movement from mass production toward production as described in *The Machine That Changed the World*, (Womack, Jones & Roos, 1990), which discussed the significant performance gap between Western and Japanese automotive industries. This book described the important elements accounting for superior performance as lean production. The term "lean" was used because Japanese business methods used less human effort, capital investment, floor space, materials, and time in all aspects of operations. The resulting competition among U.S. and Japanese automakers over the last 25 years has led to the adoption of these principles within all U.S. manufacturing businesses.

#### **What Is Lean Manufacturing**

Lean Manufacturing can be defined as:

"A systematic approach to identifying and eliminating waste (non-value-added activities) through continuous improvement by flowing the product at the pull of the customer in pursuit of perfection."

#### **Key Words**

##### **Value**

In lean production, the value of a product is defined solely by the customer. The product must meet the customer's needs at both a specific time and price. The thousands of mundane and sophisticated things that manufacturers do to deliver a product are generally of little interest to customers. To view value from the eyes of the customer requires most companies to undergo

comprehensive analysis of all their business processes. Identifying the value in lean production means to understand all the activities required to produce a specific product, and then to optimize the whole process from the view of the customer. This viewpoint is critically important because it helps identify activities that clearly add value, activities that add no value but cannot be avoided, and activities that add no value and can be avoided. In typical organizations, the activity that is performed usually falls into one of the below categories:

5% Adds Value

30% necessary Non Added Value

65% unnecessary Non Added Value

Eliminating the Non Added Value activity that exists is the greatest potential source of improvement in corporate performance and customer service.

### **Continuous Improvement**

The transition to a lean environment does not occur overnight. A continuous improvement mentality is necessary to reach your company's goals. The term "continuous improvement" means incremental improvement of products, processes, or services over time, with the goal of reducing waste to improve workplace functionality, customer service, or product performance (Suzaki, 1987). Continuous improvement principles, as practiced by the most devoted manufacturers, result in astonishing improvements in performance that competitors find nearly impossible to achieve.

Lean production, applied correctly, results in the ability of an organization to learn. As in any organization, mistakes will always be made. However, mistakes are not usually repeated because this is a form of waste that the lean production philosophy and its methods seek to eliminate.

### **Customer Focus**

A lean manufacturing enterprise thinks more about its customers than it does about running machines fast to absorb labor and overhead. Ensuring customer input and feedback assures quality and customer satisfaction, all of which support sales.

### **Perfection**

The concept of perfection in lean production means that there are endless opportunities for improving the utilization of all types of assets. The systematic elimination of waste will reduce the costs of operating the extended enterprise and fulfill customer's desire for maximum value at the lowest price. While perfection may never be achieved, its pursuit is a goal worth striving for because it helps maintain constant vigilance against wasteful practices.

### **Focus On Waste**

The aim of Lean Manufacturing is the elimination of waste in every area of production including customer relations, product design, supplier networks, and factory management. Its goal is to incorporate less human effort, less inventory, less time to develop products, and less space to become highly responsive to customer demand while producing top quality products in the most efficient and economical manner possible. Essentially, a "waste" is anything that the customer is not willing to pay for.

## **Types of Lean Manufacturing Tools**

Good Management Technique

Operational Planning

Value Chain Mapping

5 “S” System

Visual Factory Management Techniques

Product Redesign

Quality Function Deployment

Process Definition and Redesign

SMED

Systematic Data Based Problem Solving

Deductive Problem Solving

Statistical Process Control

Just In Time

Kanban

Poka Yoke

Organizational Mission Analysis

Constraint Analysis and Removal

Capacity Utilization Analysis and Improvement

Etc. – There are literally scores of potential improvement methods.



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<b>Books And Chapters</b>			
The Lean Enterprise	Dimancescu, D.	(1997)	Amacom, New York
The Just-In-Time Self Test: Success Through Assessment and Implementation	Fisher, Dennis	(1995)	Irwin Publishers
The Goal: A Process of Ongoing Improvement	Goldratt, Eliyahu M.	(1995)	The North River Press
Principles and Practices of Lean Manufacturing	Hall, Arlie	(1995)	University of Kentucky
Principles and Practices of Lean Manufacturing	Hall, Arlie	(1995)	University of Kentucky
Value Stream Mapping	Hines, P	(1999)	Addison Wesley
Value Stream Management: The Development of Lean Supply Chains	Hines, P	(1999)	Financial Times Management
Factory Physics: Foundations of Manufacturing Management	Hopp, Wallace J. and Spearman, Mark L.	(1996)	Irwin Publishers
Kaizen: The Key to Japan's Competitive Success	Imai, Masaaki	(1986)	Mcgraw-Hill
Toyota Production System: An integrated Approach to Just-In-Time	Monden, Yasuhiro	(1993)	Industrial Engineering and Management Press
TPM: The Lean Approach	Rich, N.	(1999)	Tudor Business Publishing
Policy Deployment	Rich, N.	(2000)	Tudor Business Publishing
The Fifth Discipline: The Art and Practice of the Learning Organization	Senge, Peter	(1990)	Doubleday Publishing
The Great Game of Business	Stack, Jack	(1994)	Doubleday Publishing
Just-in-Time for America	Wantuck, Kenneth A.	(1989)	KWA Media
Lean Thinking: Banish Waste and Create Wealth In Your Corporation	Womack, J.P. and Jones, D.T.	(1996)	Simon and Schuster
The Machine That Changed the World	Womack, JP	(1990)	Rawson Macmillan

Articles and Conference Papers			
The Use of the Value Adding Time Profile	Bicheno J. and Sullivan J.	(1998)	Inventory Management Journal (1999)
Aligning Continuous Improvement Along the Value Chain	Brunt D., Hines P., and Rich, N.	(1998)	International IPSERA Conference, London
Costing the value stream to remove non-value added	Brunt D., Hines P, Sullivan J	(1999)	
Waste elimination in Lean production — a supply chain perspective	Brunt D., Butterworth C.	(1998)	ISATA Conference, Dusseldorf
The Seven Value Stream Mapping Tools	Hines, P.	(1997)	International Journal of Operations and Production Management
Lean Logistics: an introduction	Hines, P.	(1997)	International Journal of Operations and Production Management
Non-Value Adding	Simons, D.	(1999)	International Symposium on Logistics
From Lean Production to the Lean Enterprise	Womack, J.P. and Jones, D.T.	(1994)	Harvard Business Review
Beyond Toyota: How to Root Out Waste and Pursue Perfection	Womack, J.P. and Jones, D.T.	(1996)	Harvard Business Review