

Lean Manufacturing Essentials

Lean Manufacturing Defined & Explained



Lean Manufacturing is "manufacturing without waste." Waste has many forms. Material, time, idle equipment, and inventory are examples. **Most companies waste 70%-90% of their available resources.** Even the best Lean Manufacturers probably waste 30%.

This is an enormous opportunity. Lean Manufacturing and Cellular Manufacturing improve material handling, inventory, quality, scheduling, personnel and customer satisfaction. These improvements are not just a few percentage points, they are order-of-magnitude. Typically such improvements range from 30%-90%. The benefits have been documented by academic researchers and some of their work is available at our website.

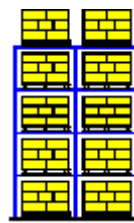
The Core Disciplines

Most waste is invisible. Nor is elimination easy. A set of techniques that identify and eliminate waste has evolved: "Lean Manufacturing."

- **Cellular Manufacturing**
- **Pull Scheduling (Kanban)**
- **Six Sigma/Total Quality**
- **Rapid Setup**
- **Team Development**

These are core disciplines. Not every organization requires them all. Others require supplementary disciplines such as 5S. Determining which disciplines are most important and/or urgent is the subject of Strategos' "Workshop for Wagon masters" that formulates an implementation plan.

Inventory



Besides core disciplines, there is an **overall theme** of inventory reduction. Inventory hides waste. Almost every imperfection or problem creates a need for inventory. Hence, inventory is a result and measures the imperfection of the system. Inventory also devours capital. For most companies, the inventory savings alone provide funding for implementing the system and the largest savings occur early on. Thus, Lean Manufacturing is essentially self-funding.

People & Technology



Factories include people. To function well, people and technology must integrate in a system that exploits the strengths and minimizing the limitations of each component. **Every core discipline has a psychological component.** Eric Trist called this a Socio-Technical System. You can learn more about Socio-Technical systems on our site including a compilation of the primary principles.



The Systems Perspective



The core disciplines are interdependent. Each acts upon and improves the others in a continuous "Virtuous Circle". Over time, this reinforcement builds momentum like a snowball rolling downhill. Results for the system are greater than the separate effects. For more, see "Manufacturing As A System."

Science Vs. Slogans

At Strategos, we prefer a scientific and engineering perspective rather than slogans, edicts, imitation and proselytizing.

Science necessarily includes the human disciplines since humans are part of the system. The work of Maslow, MacGregor, Trist and many others who studied human psychology in the workplace is part of our repertoire.

This fundamental approach allows us to carry principles into new and different industries where there are no examples to copy. Lean principles are at work today in everything from insurance to funeral services and we have helped with some of this transfer.

Manufacturing Strategy

Wickham Skinner points out that a blind imitation of 30-year-old, widely known, Japanese techniques is unlikely to assure competitive advantage. Even if direct imitation worked (and it does not), companies who attempt this will always be years behind the leaders.

The Manufacturing Strategy approach can build **sustained competitive advantage** by

starting with market requirements and focusing on a consistent, doable set of **Key Manufacturing Tasks**. These are the tasks that win orders in the marketplace.

In strategy, science meets its limits. Here, art and intuition tend to dominate although there are some basic principles and analytical tools.

Using The Strategos Website

We hope to provide useful information and tools in addition to showing you how *Strategos* can assist. Our site has several hundred pages devoted to various aspects of Manufacturing Strategy and Lean Manufacturing. They include:

- **Articles**
- **Case Studies**
- **Tools & Downloads**
- **Links To Resources**

The **Site Guide** that follows illustrates the scope and depth of this information and the unique insights that we bring.

This is not just another Lean Manufacturing site. It is a place to come back to again and again.

A Personal Note



I hope you find our site interesting, informative and thought provoking. We intend to challenge your thoughts—that is one way we learn. We also invite you to challenge our thoughts.

Quarterman Lee



CONSULTANTS ENGINEERS STRATEGISTS
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Strategos Website Guide

Topic	Training	Info - Tools - Downloads	Other
General	Developing Your Training Plan	Article- Leadership Lessons from "Twelve O'Clock High" The Meaning of Kaizen Lean Manufacturing Defined & Explained Lean Manufacturing Download Central	Useful Links Book Reviews Lean Briefing-Newsletter
Cellular Manufacturing & Group Technology	How To Design Workcells- Seminar "Life In A Workcell"-Video	Lean Manufacturing Case Study Workcells- The Heart of Lean Manufacturing How To Design Workcells Workcell Design (Book Chapter) Is A Kaizen Blitz Right For You? One Piece Flow Group Technology Just In Time, Toyota & Lean Manufacturing Balancing The Work In Workcells All About Takt Time	
Kanban & Scheduling	Lean Scheduling Strategies Designing A Kanban Scheduling System Inventory Record Accuracy	Kanban Game (Software) Designing Kanban Scheduling System Rational Lot Sizing	Kanban Scheduling- Simple, Effective, Demanding (Case Study)
Layout & Facility Planning	Facility Design for Lean Mfg.	Plant Layout & Facilities Planning Book-Facilities & Workplace Design Facility Planning Template & Forms A Production Miracle at Willow Run	
Lean Manufacturing	Experience of Lean Manufacturing	A Systems View of Lean Manufacturing Is A Kaizen Blitz Right For You? The Myth of One Piece Flow Benefits of Lean Manufacturing Socio-Technical Systems	Lean Briefing-Newsletter Video- World Business Review
Manufacturing Strategy	Workshop for Wagon masters- Planning, Leading, Managing Lean Manufacturing Lean Assessment (Mini-Workshop) Accounting, Finance & Metrics	Lean Assessment (Template) The Fuss About Inventory Factory Science (Article) Great Nuclear Fizzle (Case Study) The Focused Factory	Lean Success- (Case Study)
Maintenance	Maintenance for Lean Manufacturing	High Reliability Maintenance	
Setup Reduction	Rapid Setup for Lean Manufacturing	Setup Reduction- The Missing Piece	
Strategos	Training Information Who Should Attend?		About Strategos & The Team
Team Building & Human Issues	Peak Performance Teams Leadership for Lean Manufacturing Creating & Sustaining A Lean Culture	Virtuous Circle of Team Motivation The Power of Teams Tales From Twelve O'clock High Decoding The DNA of Toyota	
Total Quality & Six Sigma	Common Sense Six Sigma Root Cause Analysis Quick & Easy Kaizen Seminar Managerial Problem Solving	Quick & Easy Kaizen ISO 9000 - What Is It? ISO 9000 Checklist The Cost of Quality	
Warehousing		How To Design A World Class Warehouse	