

## 10.1: Lean Manufacturing and Control

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Please watch the following video. In this video, you come across some definitions and tools used in Lean Manufacturing, and how their application in a real company has helped the company improve their performance while making a better use of the limited space that they had available.



Lean control, or simply lean, has become an immensely popular business control and improvement methodology in recent years. Lean control is a highly refined example of nonfinancial controls in action. Lean is a system of nonfinancial controls used to improve product and service quality and decrease waste. Lean was initially focused on improving manufacturing operations but is now used to improve product development, order processing, and a variety of other nonmanufacturing processes (sometimes called “lean in the office”).

Lean’s popularity has both resulted from, and been driven by, an explosion in the volume of lean-related educational resources. Amazon offers almost 1,800 books and other materials about lean, and Yahoo! hosts over 90 online discussion groups relating to lean. Colleges and universities, industry trade associations, and private consulting firms routinely offer courses, seminars, and conferences to explain what lean is and how to use it.

Lean control is a number of things. According to James Womack, “it is a process for measuring and reducing inventory and streamlining production. It is a means for changing the way a company measures plant performance. It is a knowledge-based system. It takes years of hard work, preparation and support from upper management. Lean is so named because it purports to use much less of certain resources (space, inventory, workers, etc.) than is used by normal mass-production systems to produce comparable output.” The term came into widespread use with the 1990 publication of the book *The Machine That Changed the World*, by James P. Womack, Daniel T. Jones, and Daniel Roos.<sup>1</sup>

Lean will always be associated with Toyota Motor Corporation because most lean tools and techniques were developed by Toyota in Japan beginning in the 1950s. After World War II, Toyota’s leaders were determined to make the company a full-range car and truck manufacturing enterprise, but they faced several serious challenges. The Japanese motor vehicle market was small and yet demanded a fairly wide range of vehicle types. This meant that Toyota needed to find a way to earn a profit while manufacturing a variety of vehicles in low volumes. In addition, capital was extremely scarce, which made it impossible for Toyota to make large purchases of the latest production equipment. To succeed, or even survive, Toyota needed a way to build vehicles that would require fewer resources. To achieve this goal, Toyota’s leaders, principally Eiji Toyoda and Taiichi Ohno, began to create and implement the production techniques and tools that came to be known as lean.

To gain the most benefits from lean, managers must be able to determine what specific lean tools and techniques will be effective in their particular business. And to make that determination, they must clearly understand what lean is designed to accomplish (its primary objectives) and what core principles lean is based on. With this understanding, managers can decide which lean tools will work well in their business, which lean tools will need to be modified or adapted to work well, and which tools are simply not appropriate.

What, then, are the major objectives and core principles of lean? Despite the arguments and debates that often surround attempts to define and describe lean, it is clear that the ultimate objective of lean is the avoidance of *muda*, or wasteful activity, in all business operations. Muda comprises seven deadly wastes. In the lean world, waste means any activity or condition that consumes resources but creates no value for customers. Therefore, seven deadly wastes include the following:

1. **Defects** prevent the customer from accepting the product produced. The effort to create these defects is wasted. New waste management processes must be added in an effort to reclaim some value for the otherwise scrap product.
2. **Over-production** is the production or acquisition of items before they are actually required. It is the most dangerous waste of the company because it hides the production problems. Over-production must be stored, managed, and protected.
3. **Transportation** is a cost with no added value. In addition, each time a product is moved it stands the risk of being damaged, lost, and delayed. Transportation does not transform the product in any way that the consumer is willing to pay for.
4. **Waiting** refers to both the time spent by the workers waiting for resources to arrive, the queue for their products to empty as well as the capital sunk in goods and services that are not yet delivered to the customer. It is often the case that there are processes to manage this waiting.
5. **Inventory** in the form of raw materials, work-in-progress, or finished goods represents a capital outlay that has not yet produced an income either by the producer or for the consumer. Any of these three items not being actively processed to add value is waste.
6. **Motion** refers to the actions performed by the producer, worker, or equipment. Motion has significance to damage, wear, and safety. It also includes the fixed assets and expenses incurred in the production process.
7. **Over-processing** is defined as using a more expensive or otherwise valuable resource than is needed for the task or adding features that are designed for but unneeded by the customer. There is a particular problem with this item regarding people. People may need to perform tasks that they are overqualified for to maintain their competency. This training cost can be used to offset the waste associated with over-processing.

## References

1. Womack, J. P., Jones, D. T., & Roos, D. (1990). The machine that changed the world. New York: Rawson Associates, 1990.

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