

BA 2096
Fundamentals of Lean Management

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Lesson One:

Lean Thinking: How Businesses Create (and Destroy) Value

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A. Key Learning Points

1. Waste (“muda”) exists in all businesses.
2. Lean Management is a systematic way to “get the right things to the right place at the right time, the first time, while minimizing waste” and seeking continuous improvement and innovation.
3. Effective deployment of Lean Management in a traditional business can deliver radical ROI by eliminating non-value added activity.
4. The “Four Fundamentals of Lean Management” are:
 1. Identify the Value Stream.
 2. Create Flow.
 3. Create Pull.
 4. Expect Perfection: Work Smart.

B. Real World Examples and Considerations for Practitioners

1. Waste exists in all businesses. The Japanese word for waste is “muda.” And Toyota, the global leader in lean manufacturing and management systems has identified eight primary sources of waste in any business. Do you recognize one or more of the following sources of waste in your business or in a business where you currently shop?

- Mistakes that require rework.
- Mistakes that result in scrap.
- Excessive inventory.
- Unsellable inventory.
- Unnecessary steps in a system or process.
- Unnecessary movement or transportation of people and materials.
- People waiting downstream because of a delay or failure of an upstream activity.
- Goods and services that don’t meet the needs of your customers.

In some businesses, waste accounts for almost 90 percent of the total costs of producing a product or service. And businesses tend to pass these costs along to the consumer which increases the price without adding value. For example, some US automakers have been known to inflate the price for a new automobile almost \$2,000 in anticipation of potential future warranty costs the manufacturer may incur to rework or replace defective or unreliable parts. Ironically, these manufacturers have also been quite skillful selling fearful consumers “extended warranties” for mediocre products that should have been built right and built to last the first time.

Toyota, by contrast, has focused for more than sixty years on building and operating a business that minimizes or eliminates waste in design, production and distribution. By eliminating waste, Toyota has produced and sold cars that consistently offer consumers maximum value and reliability for dollars invested in the initial purchase and ongoing operation of their automobile.

Although this “Toyota Production System” or Lean Management Method has been studied and copied by automakers and manufacturers in other industries seeking competitive advantage, Toyota continues to set the global standard for excellence in daily execution of lean management solutions that maximize value both for investors and for consumers.

While some businesses adopt lean methods and tools selectively with special emphasis on realizing efficiencies in manufacturing and operations, Toyota has introduced and leveraged lean thinking and management throughout the entire business. By anticipating and eliminating waste when products are in the research, design and engineering phase, Toyota assures greater efficiencies when the products are manufactured and even greater profitability when the products are sold.

For those who are interested in a detailed description of the Toyota Production System, please see “The Toyota Way: 14 Management Principles from the World’s Greatest Manufacturer” by Jeffrey Liker (McGraw- Hill, 2004).

2. Lean Management is a systematic way to “get the right things to the right place at the right time, the first time, while minimizing waste” and seeking continuous improvement and innovation.

Did you hear the story about the frequent business traveler who was embarking on a business trip with appointments first in Phoenix and next in Los Angeles.?

When he checked in for departure at the Albuquerque Airport, he asked the airline to send one of his bags to Phoenix and the other one to Los Angeles.

“I’m sorry, sir,” said the airline employee, “we can’t send your bags to two destinations.”

“Of course, you can!” the businessman replied. “You did it to me (by mistake) last week!!”

This story, of course, is not funny if you have experienced lost or misrouted baggage which is quite likely since airlines are notorious for delays and errors in routing and transporting people and their luggage. And to make matters worse, airlines typically force customers to make unnecessary and unwanted connections in one or more intermediate airports that, in turn, increase the likelihood of errors and delays in baggage handling.

Considering how much waste is designed into most airline businesses, it is no surprise that the industry as a whole is so unprofitable. It also becomes clear why Southwest Airlines which, by contrast, tends to do a much better job consistently getting people and their baggage to the right place at the right time, the first time at comparatively lower prices has consistently been so successful from its very first day in business.

Contemporary consumers have more choices than ever. They will pay for products and services that offer value and resist payment for non-value added cost or activity. In this competitive global marketplace, the best businesses are striving to assure customer satisfaction and long-term loyalty by minimizing or eliminating waste in design, production, marketing and distribution of goods and services. To preserve or increase their profit margins, the best businesses are adopting and implementing lean management methods and tools that help them get the right things to the right place at the right time, the first time, while minimizing waste and seeking continuous improvement and innovation.

When effectively deployed in a traditional business, it is not unusual for lean management methods and tools to produce radical returns on business investment that typically include one or more of the following breakthroughs in performance.

- Double labor productivity.
- 90 percent reduction in throughput times.
- 90 percent reduction in inventories.
- 50 percent reduction in out-of-box issues for customers.
- 50 percent reduction in scrap.
- 50 percent reduction in injuries.
- 50 percent reduction in time-to-market for new products.
- Increased capacity for quick, cost-effective response to special orders or customization of existing products and services.

3. The “Four Fundamentals of Lean Management” are:

- Identify the Value Stream - Define value based on understanding and responsiveness to customer requirements.
- Create Flow - Line up value-creating actions in an effective sequence.
- Create Pull - Manage continuous, uninterrupted flow of these activities upon request from people downstream.
- Expect Perfection: Work Smart - Expect all people to participate in continuous daily incremental learning and improvement.

Since lean management focuses intensely on elimination of non-value added activities, the first step in a lean management initiative must define value which, in turn, is defined by customers’ current and future requirements. If you do not know what customers truly value then how can you distinguish between what is value-added and what is not value-added?

Although Toyota is famous for its efficiencies in automobile production and assembly, Toyota’s lean business success begins with its research, understanding and responsiveness to its customers’ expectations and preferences. Unlike most auto manufacturers, Toyota has never brought a vehicle to market that was poorly received by its customer-base. Toyota’s consistency and brilliance in designing, producing and selling cars that customers truly love is a predictable result of the investment it makes not only in researching the preferences of new customers but also in documenting and analyzing the driving habits, maintenance schedule, product satisfaction and repurchase intentions of its existing customers.

The second step in a lean management initiative lines up business activities that add value in a sequence that flows continuously with little or no waste. The most obvious signs of waste in any business are scrap and rework. Scrap results from businesses that produce too much. And rework occurs when the product or service is not built right the first time. When a business is over-producing, the flow must be slowed to better match the demand. When a business is producing too much product that requires rework it must identify, analyze and correct upstream causes of errors. Many businesses also experience waste when work backs up or becomes bottlenecked behind one or more steps in production. And most businesses can also achieve significant efficiencies by reconfiguring the physical workplace to better support and accelerate the timely flow of products and services.

The third step in a lean management initiative focuses on creating and managing “pull” of products and services based on demand or requests from people downstream. If you want to understand and analyze pull in a business begin at the point-of-purchase and walk “backwards” or “upstream” into the business. For an automaker, for example, begin at the dealer by examining the inventory available for purchase on-site. Now move upstream to the factory and examine the volume and mix of vehicles that are currently in “finished goods” and ready for shipment to dealers. Now move upstream into the final inspection stage of

production and examine how many vehicles have been set aside for rework. Now move upstream into assembly and production and notice: (a) how much work is currently in progress; (b) how smoothly product is flowing; and (c) how much in-process inventory is being created at each stage in production. Now move upstream into the warehouse and examine how raw materials, parts and components are received and stored in preparation for production. And finally, ask management how the business integrates its sales and production/operations planning to anticipate and respond “just-in-time” to customer demand.

The fourth aspect of a true lean management initiative focuses on the overall leadership mindset, work culture and daily business commitment both to the highest standards of performance and to the relentless pursuit of improvement and innovation. In lean businesses, all employees work closely together each day to assure excellence and continuous improvement of current operations. In a high-performing, pull-driven, waste-free business, each employee at every work station is responsible for producing quality product on-demand “just-in-time” for the next downstream internal or external customer. When a problem occurs in a lean business, the entire business stops and all employees are responsible for a swift, smart, practical analysis and resolution of the root cause of the problem. Management in a lean business, of course, is expected to lead by example and to design and develop a business culture, work environment and workforce that takes pride in and rewards this standard of excellence in service and production.

C. Lean Toolbox

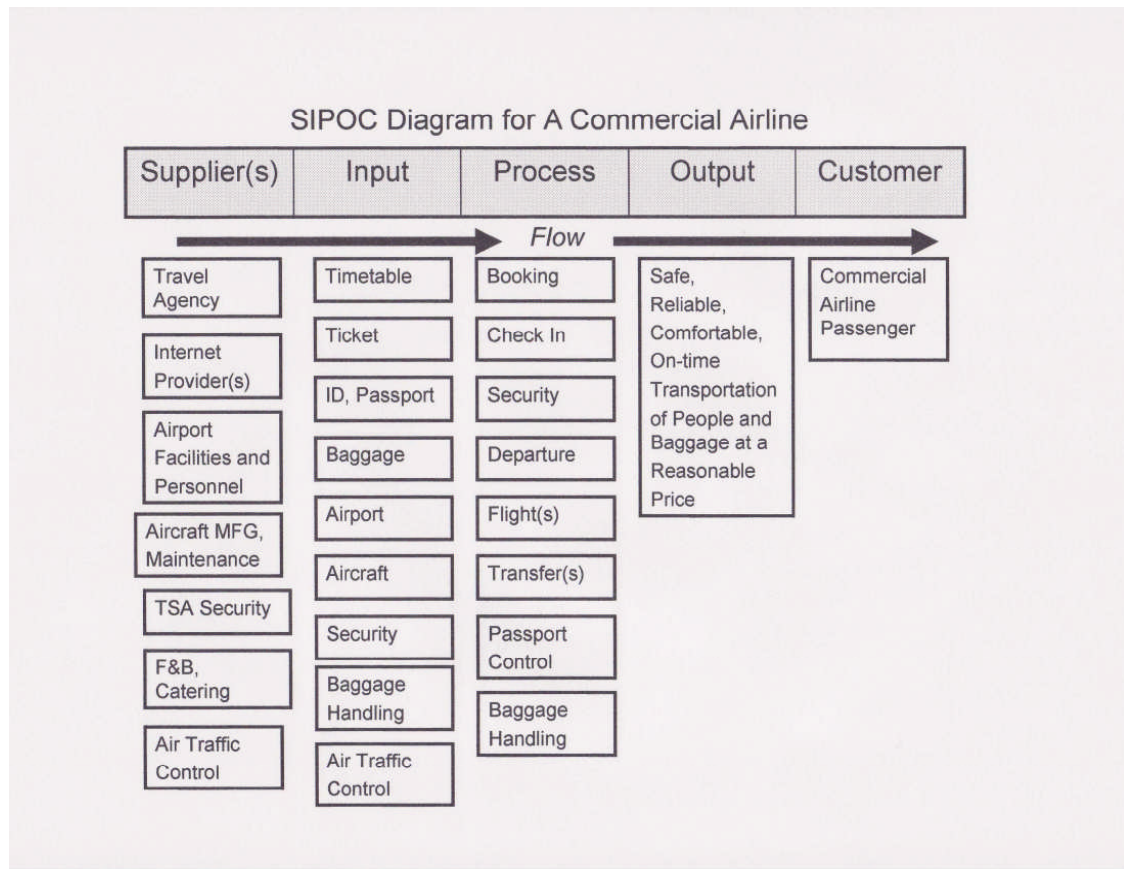
It’s sometimes said that it is difficult to manage what you can not see. Many quality and lean management methods and tools therefore create pictures or maps of activities that help managers see and understand their current business as a first step toward improving or changing it altogether.

A SIPOC Diagram is a powerful tool to illustrate your current business system. SIPOC is an acronym for five inter-related business elements (Supplier, Inputs, Processes, Outputs, and Customers) that must flow and function effectively together if you expect to create a truly lean business.

To create a SIPOC diagram, (1) begin by identifying and naming the customer. and then work back upstream to: (2) clarify the outputs that are required by the customer; (3) clarify the process steps or activities that are needed to deliver the outputs; (4) clarify the inputs, ie. information, raw materials and/or parts and components that are required for the process to produce the desired outputs; (5) identify the internal and external suppliers who are needed to produce the required outputs as expected by the customer.

A SIPOC diagram is a high level snapshot of the overall value stream. It is an excellent beginning point for any lean initiative. The most valuable SIPOC diagrams are developed by the team of interdependent employees and external partners/suppliers who are most responsible for producing the goods or services.

Please see the sample SIPOC diagram for an airline on the next page.



D. Recommended Reading Assignment & Highlights – All selections are from Womack and Jones, *Lean Thinking: Banish Waste and Create Wealth in Your Corporation*, pp. 15-28

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“Muda. It’s the one word of Japanese you really must know. It sounds awful as it rolls off your tongue, and it should, because muda means “waste,” specifically any human activity which absorbs resources but creates no value: mistakes which require rectification, production of items no one wants so that inventories and remaindered goods pile up, processing steps which aren’t needed, movement of employees and transport of goods from one place to another without any purpose, groups of people in a downstream activity standing around waiting because an upstream activity has not delivered on time, and goods and services which don’t meet the needs of the customer. (p. 15)

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“When Pratt & Whitney, the world’s largest manufacturer of aircraft jet engines, recently started to map its value streams for its three families of jet engines, it discovered that activities undertaken by its raw materials suppliers to produce ultrapure metals were duplicated at great cost by the next firms downstream, the forgers who converted metal ingots into near-net shapes suitable for machining. At the same time, the initial ingot of material – for example, titanium or nickel – was ten times the weight of the machines parts eventually fashioned from it. Ninety percent of the very expensive metals were being scrapped because the initial ingot was poured in a massive size – the melters were certain that this was efficient – without much attention to the shape of the finished parts. And finally, the melters were preparing several different ingots –

at great cost – in order to meet Pratt’s precise technical requirements for each engine, which varied only marginally from those of other engine families and from the needs of competitors. Many of these activities could be eliminated almost immediately with dramatic cost savings. (p. 20)

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“The first visible effect of converting from departments and batches to product teams and flow is that the time required to go from concept to launch, sale to delivery, and raw material to the customer falls dramatically. When flow is introduced, products requiring years to design are done in months, orders taking day to process are completed in hours, and the weeks or months of throughput time for conventional physical production are reduced to minutes or days. Indeed if you can’t quickly take throughput times down by half in product development, 75 percent in order processing, and 90 percent in physical production, you are doing something wrong. What’s more, lean systems can make any product currently in production in any combination, so that shifting demand can be accommodated immediately.” (p.24)

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