

Introduction to the Lean culture

Lean is a culture built around a philosophy of continuous improvement and respect for people.

Executive Summary: Lean is mostly a culture and a way of thinking. Valuing people, admitting mistakes and finding defects, a team approach to problem solving, involve the operators and those closest to the work, measure performance to make improvements, and teamwork are the foundations. Below are various descriptions of the major facets of Lean.

Lean is about the elimination of waste. This is the most common summary of the definition of Lean. And, in fairness, a high number of improvements can be categorized by this definition. To be clear, Waste is defined as any activity or cost for which the customer is not willing to pay. But, there are things that we must do and for which the customer is not specifically willing to pay but without such a process the product will not be completed.

There are seven or sometimes eight deadly wastes: Transportation (unnecessary), Over-production, Motion (unnecessary human motion), Defects, Waiting (for delivery or processing to finish), Inventory (WIP or other inventory waiting for next steps), Processing (extra and unnecessary) and Under-utilized human potential. Future possible waste categories include Unsafe conditions, Confusion or Uncertainty.

Beware of eliminating one of the eight wastes while simultaneously creating another.

Lean creates a culture of continuous improvement. Favoring small steady improvements over time as well as larger scale timebound events, called Kaizen, one of the hidden gems of Lean has to do with development of personnel. How do we guide people from average worker to great employee? Let's say Susan comes to you with an idea. You can ask questions to guide Susan further along her Lean journey and give your approval. Or, you can say, "No Susan, it would be better if you implement my idea. If you learn to think like me, you will get promoted." If we can encourage many employees to constantly be on the lookout for improvement ideas, we will surely and steadily improve our business.

Lean is production using a "one-piece-flow" philosophy. Specifically, this is the reduction (as much as possible) of batching. Lean assembly lines are often described as a dance, where one process finishes and passes to the next step at exactly the point when it is needed. Concepts like Takt Time mean that the customer is asking you to achieve the production of one unit every 3 minutes (for example) which is not the same as producing 20 units in the last 5 minutes of each hour.

The measure of WIP in between each workstation of an assembly line is a key metric of Lean. Finding quality issues at the end of an assembly line after producing many of each component at every step along the way, is a costly way to learn the benefits of one-piece flow. Ideally, in a 7-workstation assembly line, you would have 7 units (maybe 8) between the first step and the final workstation. This means a maximum of 7 or 8 pieces to rework or scrap.

React-ability or Adaptability is another key component. If you are producing one unit every 3 minutes, then when something changes, you have completed units that you can ship though you may not have the complete order. Or, if you have two customers requiring one of the same components, you may be able to make some final units for each customer, rather than staring at a pile of partially assembled components for the wrong customer.

One-piece flow does not mean everything has to be exactly one piece at a time. Consider a machines setup to run eight parts in one simultaneous cycle. It does not make sense to change to one piece. It is the pursuit of one-piece flow and getting as close as is feasible that is important; not exactly one piece.

Lean is organization, cleanliness and placement. **5S** is one of the major toolsets of Lean. This is a fundamental, process-based way to clean up, straighten up and consider ergonomics at the same time. The five words beginning with S may change, but the meanings are the same. In the 5 steps, we **Sort** out what we don't need, **Straighten** what we will use, **Scrub (Shine)** and clean so it's in good working order and reduce contamination, **Standardize** what is in the work cell and where it will be located and then **Sustain** the system that we have implemented. In this way, clutter is eliminated, items are placed appropriately, accounting for reach and weight limits, contamination and dirt are eliminated or reduced, instructions or directions keep the placement the same and finally controls are put in place to monitor the adherence to the placement. And often **Safety** is considered a sixth S.

Lean is quality conscious. Eliminating waste is not the same as cutting corners. Earlier I cautioned to avoid eliminating one waste and thereby causing another. Lean is about balance. Quality must be maintained, but only so far as the customer is willing to pay for it, or as far as you want your reputation maintained. If you make a product that will last a million years, you could probably reduce that standard. Lightbulbs that last 200 years but cost \$4,000 probably will remain on the store shelf.

Lean is process understanding and detailed mapping. Another key toolset of lean is called a Value Stream Map. This is a visual representation of your entire operation, from Supplier's Supplier to Customer's Customer. But often, you can start with first tier suppliers' communication channel and delivery methods and extend to first tier suppliers and communication and delivery between you and them. There are standard diagrams and symbols to use in these maps and metrics to capture. Important metrics are inventory levels and lead times between processes or entities. Also shown on the map are communication signals between steps, transport methods, dollars represented at each process and any capacity constraints. Creating a Future State and bridging the gaps from the Current State creates the plan to correct your greatest opportunities.

Often, those in the Lean movement talk about lowering the water level to be able to see the rocks. This analogy compares impeding the flow of water in a stream to slowing the flow of production in manufacturing. Improving Flow will result in many benefits including an improvement in Return on Investment.

For more info, search for: The House of Lean, The Toyota Way, Kaizen, Sensei, Lean Problem Solving

Japanese	English	How to do
SEIRI	<i>Sort</i>	The act of removing unnecessary items from the workspace. Often this is accomplished by removing everything and putting back only what is needed.
SEITON	<i>Straighten</i>	Arranging your work station (or area). Items that you use every hour should be in close proximity. Items used once per day or week can be further away, and so on.
SEISO	<i>Scrub (or Shine)</i>	Clean your work area and keep it clean. Beyond the concerns of contamination, it is better from every perspective to work in a clean environment and workspace.
SEIKETSU	<i>Standardize</i>	Once agreement is reached, then label locations, build shadow boards, take pictures, etc... to make it clear where items are supposed to go and what the area is supposed to look like. A place for everything and everything in its place.
SHITSUKE	<i>Sustain</i>	Create the culture and the expectation that the workplace will be maintained (with continuous improvement too). Perform audits to ensure that everyone is maintaining the area, perhaps a detailed scorecard to show specific areas for improvement. Assign a champion.

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