

Essay on lean

Business, Strategic Management



As trained industrial engineers, it seems pretty basic to us. Its simplicity is what makes it work. While the Japanese are rightfully given credit for re-vitiating the concept of lean, its roots really go back to Frederick Winslow Taylor of Bethlehem Steel in the asses and asses. Then it was called " Scientific Management. " The Taylor approach starts with a clean slate - it designs the process to, as much as possible, only include steps that create value in the product. It is well suited for new plants, new products or new processes. The Japanese approach addresses existing plants, products and processes.

It is focused on eliminating " waste" (anything that is not adding value). As waste is reduced, quality improves, production times are reduced and cost is minimized. Various methodologies are used as tools to achieve this including Value Stream Mapping, AS, Kanata (pull systems) and error-proofing. Our view is that starting with Tailor's approach lets you establish the perfect world as a base line. Using the Japanese approach then helps you work toward the perfect world. Let's use a casting example. A typical process might be to cast, clean, finish, re-clean, machine and ship.

Why do we clean, finish and machine? We now these processes often can't be eliminated but why not try? If the casting can be produced as-cast either by achieving best practice methods or changing casting methods (investment casting and lost foam often achieve as-cast parts), machining can be eliminated or minimized. If you don't put the stock on you don't have to take it off. Why is finishing (or at least why is so much) required? We know a state-of-the-art MEMO producing iron castings in green sand that require almost no finishing. Are you grinding/trimming parting lines?

Then your patterns or molds may need attention. Are you grinding rough casting surfaces? Then your sand is not right or your die casting practices need improvement. Grinding gates? Can they be relocated to areas where they can be left untouched and minimized using knife gating? Are you welding? If you are not joining parts in welding all you are doing is fixing mistakes. Why do you clean before finishing? Good sand and shake-out practices should produce castings that are clean enough for finishing. Just clean one time after finishing. What's your scrap level?

If you're not under 3% total scrap, no matter what casting method you use, you are not achieving best practice. That's without welding and other salvage operations by the way. There are metal casters achieving these levels every day. How do they do it? They share a lot of common traits. First, they understand what best practice is for the process they are using. That includes melting, molding, sand preparation, finishing or what-ever process they are using. They know the best practice way to do everything. You would be surprised at how many metal casters we visit who don't know what can be done.

Next, they are fanatic about doing it the right way. That means equipment well maintained, systems are defined, documented and implemented the same way every time and everyone is well trained and does their job right. After that they focus on problem jobs - ones that require re-design, special gating, handling or other steps to insure they are scrap free. Finally, they document all scrap and attack issues. There

are other lean practices to implement. If production flows perfectly, there is no inventory waiting to be worked on.

Metal casters have helped minimize work-in-process by installing conveyor lines to keep castings moving right through to finished goods storage. This eliminated putting the castings in totes and the added handling. One low to medium volume gray/ductile iron Jobbing foundry (casting weights under 50 pounds) we know now ships 30% of its production the same day and believes they can achieve 70% same day shipment. These standards aren't just for the high volume or dedicated metal casting companies any more. "

Automation" or " smart automation" is a part of lean manufacturing as well.

Automation refers to automating the process so humans can focus on what humans do best. The objective here is to design the machine so it knows when it is working abnormally and alerts human. The human no longer has to monitor normal production but can focus on abnormal or fault conditions.

Removing routine and repetitive activity reduces the chance for error. Lean manufacturing is focused on doing the right tasks, at the right place, at the right time, in the right quantity to achieve perfect work flow while eliminating waste (scrap) and with the ability and flexibility to change.

Implementing lean manufacturing often requires a cultural change in all levels of the organization. Once management is committed, a program needs to be started that begins with small successes and grows to include the entire organization. The Toyota Production System (TAPS) focuses on murk and mud. Murk focuses on the preparation and planning of the process, or what work can be eliminated in the design process. Mud are those waste

steps and processes that add cost. Murk is used in new product design and mud is used to improve existing operations. TAPS identifies 7 key mud*.

They are: 0 Transportation (moving products that is not actually required to perform the processing) 0 Inventory (all components, work-unprocessed and finished stock not being processed) 0 Motion (people or equipment moving or walking more than is required to perform he processing) 0 Waiting (waiting for the next production step) 0 Overproduction (production ahead of demand) 0 Over Processing (due to poor tool or product design creating activity) 0 Defects (the effort involved in inspecting for and fixing/scrapping defects) *From " Lean Thinking", Womn, James P. ND Jones, Daniel T. , Free press, 2003, p. 352 What are the steps to developing a leanculture? 1 .

Senior management needs to agree on a lean vision. Page 3 of 8 2. Identify the project leader and set objectives for the leader. 3. Communicate the plan and vision to the workforce 4. Solicit volunteers to form the Lean Implementation Team. Five to seven people with varied backgrounds seems to work best. 5. Appoint the Lean Manufacturing Implementation Team 6. Train the team in various lean tools. AS is often a good starting point. 7. Select pilot project implementation. . Implement the pilot. Evaluate the results, review and learn from mistakes made. 9. Roll out the next project(s). 10. Train supervisors how to teach and train their employees. 11. Continue adding and training in additional lean manufacturing tools. Page 4 of 8 FIVE S Companies frequently select AS as a method to start their lean manufacturing program. Five S is a manageable process that is relatively easy for people to understand and get their arms around. Five S is a

reference to five Japanese words that have been transliterated and translated into English.

The technique is characterized, incorrectly, " standardized cleanup. " It is more than that. Five S is a method to organize and manage the workspace and work flow with the intent of improving efficiency by eliminating waste, improving work flow and reducing process inefficiencies. The ass's are: Sort (Series), Straighten (Sexton), Sweep (Skies), Standardize (Quickest) and Sustain (Skittish). Sort - This means going through the work area and making sure only essential items are present. This is eliminating tools, materials, fixtures or any other items not used in the process.

Everything else is stored or, preferably, discarded. Straighten - Straighten focuses on setting the workplace in order to focus on efficiency. This is more than just arranging the tools and equipment where they will be used and in the sequence they will be used. It is " straightening" the work path for materials, tools and the work process. Of all the steps this is the one that typically produces the greatest cost reductions. Straightening the work process can include changes in dies or tooling that reduces finishing labor, for example.

It may include interaction with the customer to implement design changes that result in cost reduction or quality improvement. It is also the step that bears the most repeat visits to implement continual improvement. Sweep - This is just what it says: keeping the workplace clean as well as neat. At the end of the shift, the work area is cleaned and everything is restored to its

proper place. In straighten, the workplace is clearly marked where things go and gives confidence in the ability to find what is needed when it is needed.

The key point here is that cleanliness is a regular part of the daily work effort, not an effort initiated when the workplace gets too messy.

Standardize - Standardizing the work practices means operating in a consistent and standardized fashion. Everyone knows their role and exactly what his or her responsibilities are. Actions are taken the same way - the right way - every time. Sustain - This means more than just maintaining what has been established. Five S becomes a way of life and a new way to operate. It is important that management does not allow a gradual decline back to the old ways of operating.

Sustain also means that when an issue arises - a suggested improvement, a new tool becomes available, or a new output requirement - the process is reviewed for improvement. Page 5 of 8 At times a sixth S - for Safety - is added. Five S purists argue that implementation of the 5S protocols will result in safety. Implementation of the 5S program usually starts with a manageable project. These tend to be in limited work areas or warehouse locations. Once implemented, the results are publicized and the concept is expanded to other areas. The strength of 5S is the ease of understanding and implementing the concept.