

Lean Is More than Textbook Recipes

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Applying the Lean methodology to both office or “transactional” work functions, as well as production environments, I have observed that Lean solutions (some times even recommended by expert consultants) fail, leaving the Lean experts scratching their heads. I, too, have had solutions that made perfect sense in a simulation perform nothing like we expected.

Observing and leading these failures taught me two very important lessons. I learned that what works very well in one factory or operation, may not work so well in another. The textbook examples from automotive industry don't work as effectively in an assembly process for door locks, for example. I also learned that a process that makes perfect logical sense, often does not account for human behavior, which can often cause problems and drive people not to follow the process as intended.

As we execute the Lean methodology to improve our processes, it is important to recall specifically what Lean is. Simply put, Lean is a set of tools and skills that we use to identify and eliminate unnecessary waste in our production and business processes. It is not a singular formula for the perfect process.

Unfortunately, we often try to leverage solutions from other examples to try and solve our specific process challenges. While these examples taken from textbooks, training examples, consultants and digital media may provide some very important insights, they are not necessarily the right solution for our process challenges.

As we develop our own skills with the Lean methodology, we must see a deeper understanding than to expect the example formula to automatically work for

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everyone, and we must seek that skill level that enables us to know how to tailor our solutions to our specific needs. That includes the needs of our personnel and their personalities.

Here is an example that I believe addresses both the understanding that one solution does not fit all, and the understanding that the human element can muck up a seemingly efficient process. This example summarizes a common mistake that I have seen many times.

Imagine a production floor that assembles door locks. Suppose a Lean and Six Sigma Black Belt delivers the corporate training on the Lean methodology to the managers and line leaders, and works with them to redesign the assembly processes.

They collectively draw from examples and the Black Belt's own experience, and install U-shaped assembly cells in each assembly line because that seems to be the thing to do, and it works so well for so many other assembly processes. They pat themselves on the back and the Black Belt goes home.

Soon however, the managers and line leaders are very unhappy. The production times are slower than the original process and the defect rate is up, not down. Suddenly the entire production floor and management staff has decided that the Lean methodology is a bunch of junk, and they won't play along anymore.

The solution that was instituted was a textbook solution, and it was worse than the non-Lean-inspired predecessor process. How can this be? Does this sound familiar? Would you believe this is drawn from more than one real experience?

As is typical in such assembly cells, a different person performs each major assembly step, then passes the partially completed product to the next person in the cell. The last assembler places completed products in the packaging and stacks them neatly to be hauled to shipping when the stack reaches a predetermined number. Does this sound about right?

This is a simplified version of the assembly processes famous in the automotive industry. However, there is one very important difference between assembling cars and assembling locks — complexity. Each assembly step for an automobile requires very specialized tools and operational skills. Also, an automobile takes up a fair amount of space. It makes more sense to move the automobile from step to step, than it does to move people and tools.

A door lock is relatively small, and the only tools required to assemble it are clamps and a screwdriver. No special skills are necessary, just some practice. So each time the lock is passed from one assembler to the next, motion and time are required to hand it off. But there are no compelling reasons to hand it off. The first assembler could perform every operation without wasting any time or energy moving the product around.

Also, not every step of the assembly process takes exactly the same amount of

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time. When assembling something very complex, minute steps can often be bundled, so that each station in the cell takes approximately the same amount of time to perform its tasks. The time for each station of the cell can be manipulated and paced to match the bottleneck or longest-lead-time step.

A door lock may only require seven- to 12-minute assembly steps. There's not much room to manipulate the flow with so few steps. As a result, every step in the cell is forced to take just as long as the longest step. If you have read the treatises on bottleneck management, then you know that this is OK. Except, I argue, it isn't necessary in this case. Remember, each assembler could perform each step just as well.

Do you see yet what a better way may be? What if the lock assembly process instead installed a circular cell with the lock components in the center and several assemblers facing the supply, each with his or her own tools? The assemblers-in-parallel would be able to build several locks at a much faster pace than several assemblers working in series, and making wasteful handoffs and waiting unnecessarily.

Assume the same seven assemblers for each cell design. Let's also say that the bottleneck process step takes seven seconds to perform. In the U-shaped cell, seven assemblers all take seven seconds to perform their assembly step and then wait to hand off (otherwise work in process starts to pile up, so waiting is preferred). Then there is a hand-off of one second. In the best possible case, the hand-off takes place during the wait period for every step but the bottleneck. That's 7×7 seconds, plus 1 for 50 seconds to spit out one lock, with six more in process.

The circular cell, where the assemblers work in parallel, has no waiting and no hand-offs. So its math may look more like this: $6+5+6+4+5+7+6 = 39$ seconds. Also, that's seven locks produced every 39 seconds, compared to one lock every 50 seconds.

For the sake of brevity, I have obviously simplified the real experiences into the above example. My point is that the automotive U-shaped cell examples in all of our textbooks on Lean are not magic formulas for waste elimination and Lean performance. They work in the environment for which they were designed, but not in all environments.

I lost count of how many arguments I had with expert Lean consultants and fellow Black Belts and Master Black Belts who wanted to apply the U-shaped work cell concept to engineering and drafting or documentation processes. It's enough to make a guy pull out his hair (refer to picture above).

Let's use the same example to talk about the human element, too. In the U-shaped cell with the series assembly, each assembler shares responsibility for quality or defects in the final assembly. This phenomenon of shared culpability can be a blessing or a curse; in this case, it's a curse.

Imagine you are an assembler on the line and you notice the person before you

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didn't insert a screw all the way. Your responsibility may be to hand it back and point out the mistake, but if the other assembler gets frustrated by your repeated nitpicking or is just plain difficult to deal with, you will eventually stop trying. When the whole cell starts getting on you for holding up the show, while you argue about it, you'll decide that it isn't your fault and the attempt to correct it isn't worth the pain.

When the defects are found, if they are found before they reach a customer, it can be impossible to pin down the responsibility since everyone changes roles in the line on a periodic or frequent basis. It's part of the idea of cross-training or making sure that the job isn't more tedious than absolutely necessary.

Now, compare that with the circular cell in which each assembler completely assembles each lock. If one pile of locks is screened and found to have some defects, it's very easy to talk directly to the one person who needs to have their process adjusted. Assemblers don't need to argue about it with each other, and if there are incentives for high-yield numbers, you better believe that these assemblers are much more motivated to do it perfectly than those who must rely on others for their bonus.

In this example, the circular cell design produces better quality product than the U-shaped cell. Some process scenarios favor normal human behavior more so than others. This understanding is much more difficult to achieve and the skill of designing for it is difficult to master, but it is very important.

The best advice I have to offer to begin developing the skills to know how and when to tailor your solutions is to ask the following question about every solution, or about every step of every solution. "Why is that the best way to do this?" An answer of, "The book did it that way," or "Someone else did it that way," is not an acceptable answer. It must make sense for your specific challenge, and you must use your tools and skills to show it.

The best advice I have to offer to begin considering the human factor in your process designs is to ask the following questions. It's best if you ask them directly and confidentially of the people who will be performing the process. "Would they really be willing to do this, or would they prefer to do something else?" "How would this make them feel about the process?"

I know they don't seem like very profound questions. However, they are basic considerations that are often overlooked, and asking the questions forces us to focus on the real problems and challenges, and to address the people and their inclinations.

The Lean methodology is very powerful. It works when we learn to skillfully use the tools and techniques. It fails if we expect to simply pull ideas out of a book and apply them to our unique problems. Lean is problem-solving. It is not applying a one-size-fits-all solution.

To truly apply the Lean methodology, we must rely on our tools and skills, not

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recipes from some book. Take a look at your own business's processes and see if there isn't room for more tailored problem-solving and less reliance on canned solutions.

Stay wise, friends.

For more information, please visit www.bizwizwithin.com [1].

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