LEAN

Bringing Lean To the Office

by **Len Tischler**

When I read statements such as "service sector productivity trails manufacturing by a wide margin,"[1] I see an opportunity to make improvements.

As an old quality guy, I was invited recently to teach a university course in lean thinking. I had to read up on lean, design the course and develop projects for the students to learn lean hands-on. I chose projects on the university campus rather than with local manufacturers, and the university's admissions office agreed to let my students try a couple of lean projects. I found lean methods provide much quicker results than the more traditional quality methods do and that they can apply very easily to office work.

In 50 Words Or Less

- **Lean manufacturing principles can produce more immediate results than other quality techniques can.**
- **A team of college students used lean to streamline processes in their university's admissions office.**
- **The students were able to reduce a process that took two to three weeks to about one day.**

The Theory of Lean

Lean is simple. We'll look at lean in terms of its purpose, principles, model, stages of implementation and expected outcomes.

Lean's purpose is to create more value while reducing waste and cost for everyone. Lean does this through three principles:

1. Let customers say what is of value to them.
2. Reduce nonvalue adding activities in the system, causing process speed to increase.
3. Faster process speed positively relates to less

waste, less cost, less work in process (WIP), less complexity, higher quality and happier customers.

Actually, you can begin by reducing waste, cost or complexity and arrive at the same results. The idea is that by reducing any one of these, the others tend to follow.

There are several models of lean in literature and practice. Womack and Jones' model,[2] probably the most widely used, has five parts:

1. Value—keep asking what our customers value and want.
2. The value stream—map the flow of the work. Find ways to speed it up or reduce costs, waste, WIP or complexity.
3. Flow—do the work so it flows through the process smoothly and without interruption. Eliminate WIP, mistake proof, make the work easy to do and monitor, and use single-piece flow.
4. Pull—produce only what customers ask for, when they need it—also known as just-in-time.
5. Perfection—keep improving.

Tapping, Shuker and Luyster[3] divide the implementation of lean into three stages:

1. Demand—understand what your customers want and when they want it. Determine the minimum time to produce each piece or smallest shipment lot.
2. Flow—create the way to do it.
3. Leveling—level the workload. Balance the pace of production against the pace of customer demand. Distribute the workload evenly.

Finally, lean has three expected outcomes:

1. Better processes—offer customers more value and do it more efficiently (less cost, less waste, least action).
2. Better working conditions—these include clearer, shared work goals and values, a greater ability to accomplish (more pride and joy in work), a greater ability to keep improving things (fewer restrictions, more growth opportunities), a feeling that you're being of service (not just stuck in routine work) and a feeling of integrity (doing what you say).
3. Meeting the organization's needs and purpose—these can include profit, growth, sustainability, value and impact.

Implementing Lean

Lean has a general process of implementation similar to the Shewhart cycle of plan-do-study-act.[4] Figure 1 shows this cycle.

Certain prerequisites are needed before implementing lean, such as getting support from the top manager and the process leader, having a trained person to facilitate the process and identifying a need for change. Next comes identifying the specif-

FIGURE 1 Implementing Lean

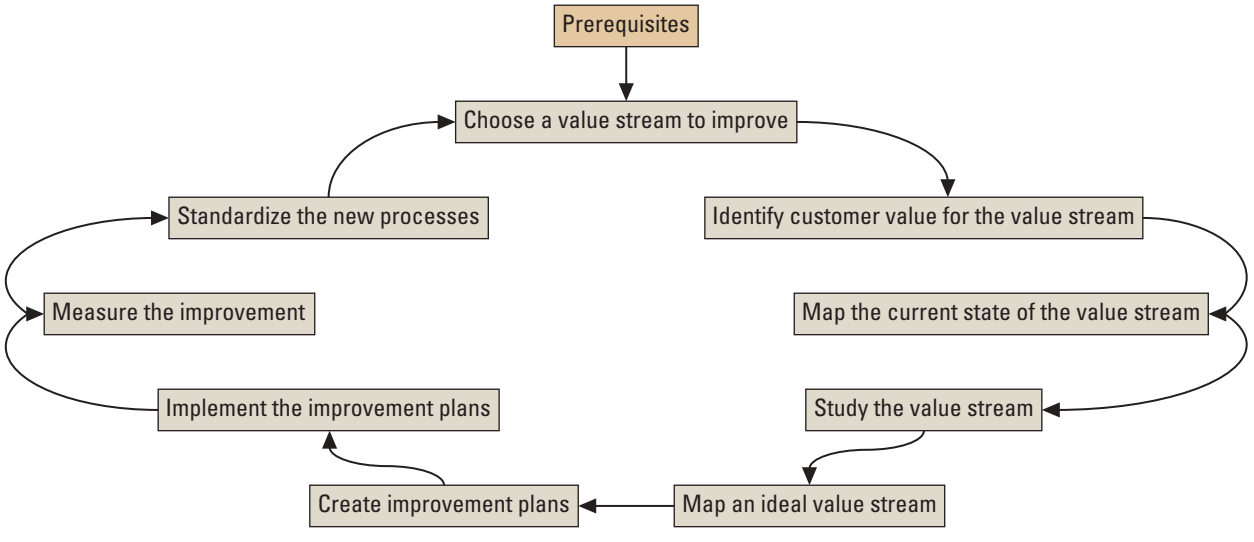
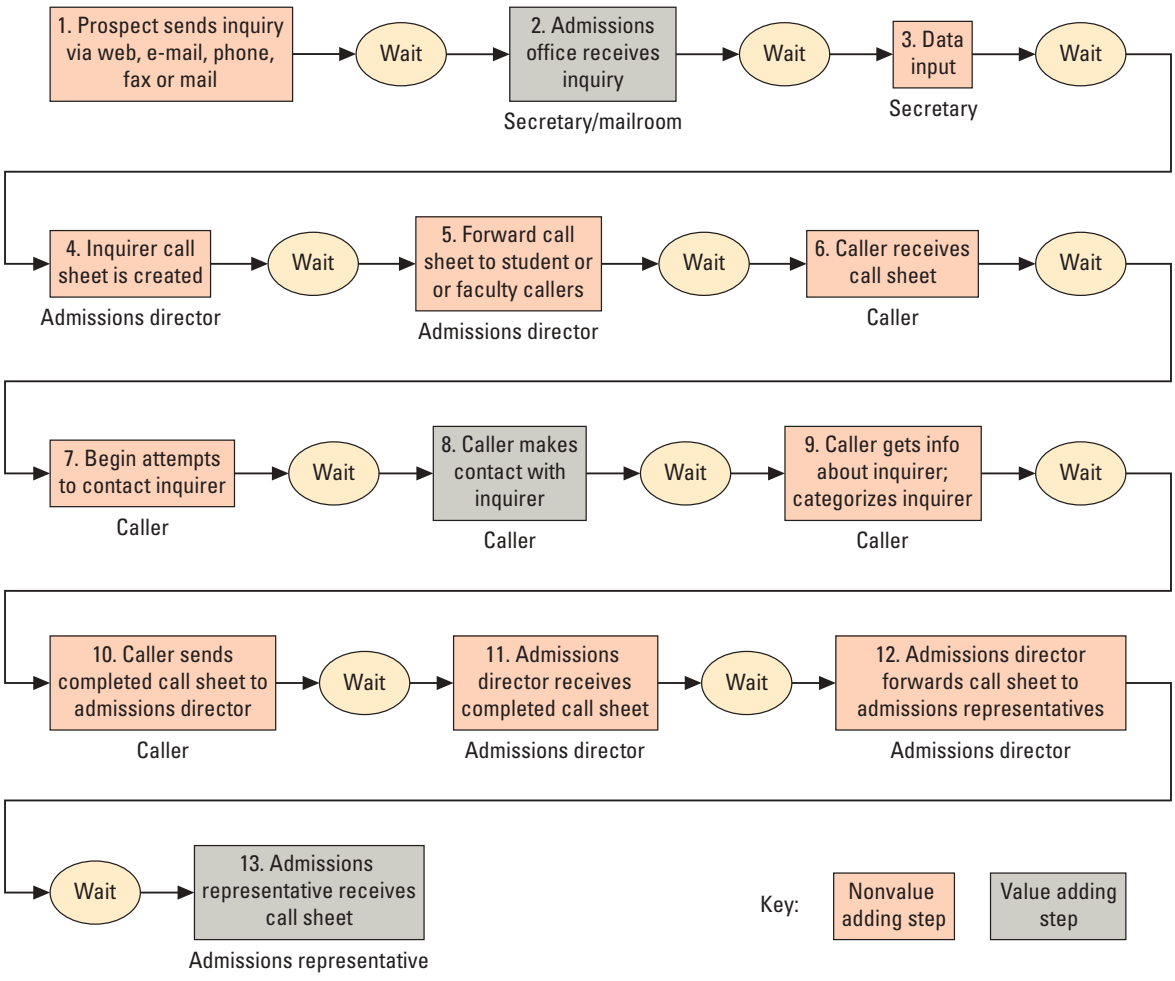


FIGURE 2 The Faculty Calling Process: Current Value Stream



ic value stream, or process, to be improved and its boundaries (beginning and end points). It is important to identify the customers served by the value stream and their various needs and wants. This is known as customer value.

Then comes mapping the value stream. This is very similar to flow charting the current state of a system or process in other quality methods. The major difference is that in lean you not only map each individual process and its order, but you also include such information as the time it takes for each action (processing time) and between each action (wait time), as well as the amounts of WIP. You then study the value stream to find the largest wastes of time and WIP. You then brainstorm or use other creative techniques to map an ideal value stream—one that contains the least amount of waste possible or creates throughput in the least amount of time.

Once you have maps of your current system and your ideal value stream, you can then create and implement improvement plans. As you study the current and ideal value stream maps, improvement ideas seem to clearly stand out, and there is little need for traditional quality tools such as Pareto or fishbone diagrams.[5]

Finally, you measure the improvement you made from your attempted changes, and you either standardize the new process or start again.

Office Example

I had my students do two projects in the university's admissions office. The first project focused on the process of handling inquiries about the university. Inquiries came from outside the university, and more than 90% were from potential new students. This value stream was called the "faculty calling process," because faculty made the initial callbacks to the inquirers. The purposes of the value stream were to:

- Respond to potential new students quickly.
- Provide good information.
- Capture information about the inquirer to ease further help.
- Forward potential new students to the correct admissions representative for follow-up.

Together with the staff, we defined the beginning and end of the process: from the time a caller submits an inquiry to the time the correct admissions rep receives the information and is able to call the person. In between, a faculty member made a first callback to the inquirer.

The current value stream included 13 steps and took an average of two to three weeks—about 10 days until the inquirer received a first call from a faculty member and another seven to 10 days until the correct admissions rep received information about the inquirer (see Figure 2). The admissions director (the value stream manager) spent four minutes per inquiry, and each faculty member spent five to 30 minutes per inquiry.

As we studied the value stream, we found only three steps were adding value: receiving the inquiry, making the initial telephone contact with the inquirer and the admissions rep receiving the needed information to follow up. Value adding was defined from the customer's (inquirer's) perspective.

As we studied the current value stream map, our first question asked what inquirers wanted. In other words, where is the customer value? Inquirers wanted to be called back quickly and usually during evenings (they were mostly high school students and at school during the day). Faculty were mostly available to call during the day.

We decided to hire professional callers for the evenings from a nearby call center for $7 to $8 per hour. We trained them to handle inquiries effectively, particularly to decide whom the inquirer should talk with next—an admissions rep, a faculty member, a current student or someone else. We asked inquirers if it made a difference to them whether a faculty member called them, and almost all said no.

Steps two through six took an average of more than seven days. They included the admissions director receiving all inquiries (which he processed about weekly, causing an average 3.5-day delay), printing a form for each inquirer, deciding which faculty member would make the initial call and sending the form through campus mail to the faculty member.

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We asked the admissions director for his criteria for deciding which faculty members received which forms, and the university's IT staff used these criteria to construct an automated decision tree for e-mailing the forms. Steps two through six now were reduced from more than seven days to less than one minute.

Another time waster was that faculty usually had to call several times over several days to reach the inquirer. By hiring professional callers in the evenings, most inquirers would be reached with fewer attempts and on the same day, thus saving time in the process and shortening response time.

Steps nine through 13 also took an average of more than seven days: Once the faculty member called the inquirer, the faculty member would complete the printed form and send it via campus mail to the admissions director, who looked at these once weekly (again, an average of 3.5 days' wait time) and decided which forms went to which

admissions reps, who received them via department mail. Again, we obtained the admissions director's criteria for this process, and the IT people automated it.

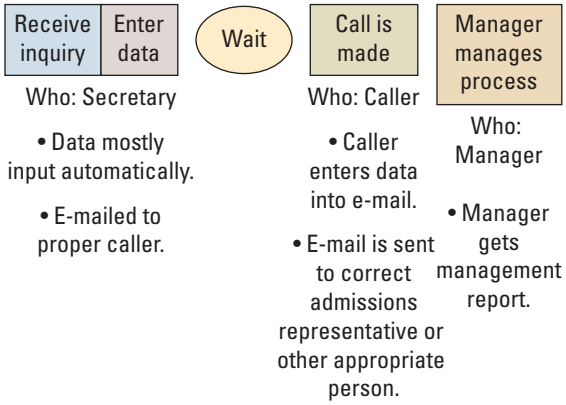
The professional caller now would receive a form online on inquiries made and received that day, complete the form while on the phone with the inquirer and almost instantly send it to the proper admissions rep, who would receive it in the morning. Steps nine through 13 were reduced from more than seven days to a few minutes.

Finally, the value stream currently was unmanageable: The admissions director couldn't know where each form was in the process. Was it in the mail? On someone's desk? Had the person been called yet? With an automated system, the admissions director could generate management reports at any time that tracked the progress of each inquiry and times of contact.

Overall, the process was simplified. The following benefits also resulted:

- Time from the beginning of the process to the end was reduced from two to three weeks to less than one day.
- The admissions director and highly paid faculty were no longer involved. This allowed faculty to focus on teaching and research rather than making phone calls, thus improving the university's quality of education and image.
- Most inquirers received a call within hours or minutes of sending their inquiry.

FIGURE 3 The Inquiry System: Ideal State Value Stream



- $500 worth of paper was saved annually.
- The campus mail system was less burdened.

An immediate automatic e-mail response thanking the inquirer for his or her interest also was implemented. The only new costs were those of setting up the automated systems, writing an operations manual for the new procedures, and training and paying the professional callers.

The ideal value stream map is shown in Figure 3.

Second Example

In the same admissions office, the assistant director was in charge of processing student applications. When a prospective student sent an application, a follow-up process would begin. My team asked all the people involved in processing applications what they did, how long each step took, who they received information from and sent information to, and what information they dealt with.

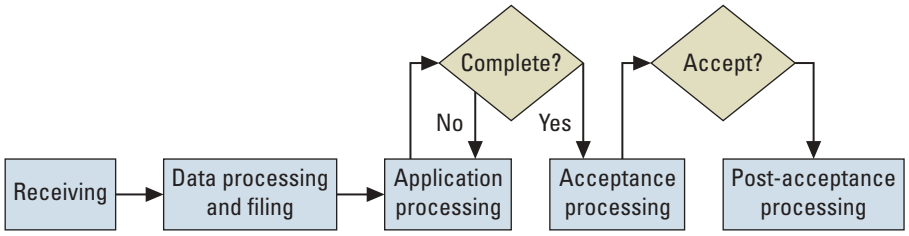
As we got their answers, a picture of an out-of-control system emerged. We tried to map the process and couldn't. Even those involved in the process agreed the system was not systematically organized. There were 88 steps that often overlapped, occurred in no clear order and were done by several different people. The process was represented in a mess of 88 sticky notes.

My students stared at this map for several hours, trying to make sense of it, bringing in value stream participants to help. They began by asking what the purpose of the system is: What customer value was being created? Customers—the student applicants—wanted to get through the system quickly and wanted to be able to know at any time where they stood in the system.

It finally dawned on my students: There are five overall steps that organize the whole value stream. Figure 4 shows the ideal value stream map. We showed it to the process owners, and they all agreed this is what they do. They were amazed at how simple the whole value stream was. After years of doing this work routinely, they were excited to finally understand their jobs and how they fit with the others' jobs in the value stream.

Immediately, the value stream manager wanted to create an operations manual. Based on the data we collected about the process times for each step and wait times between each step, she divided the work more efficiently, created better interfaces with

FIGURE 4 The New Value Stream for Handling Applications



other university departments (financial aid and the registrar), developed a process for monitoring the progress of each application and used the manual to train each person in the value stream.

The office put a system in place that allowed everyone in the value stream to track applicants' progress. IT developed a stoplight bar[6,7] to visually track information—red when information is missing, green when information is complete. IT created computer interfaces so information could be shared across the admissions, registrar's and financial aid offices.

IT also designed a Web page for applicants to see instantly what information the university still needed and the progress of their applications. Now each piece of data is entered only once, there are fewer staff handoffs, fewer errors, less overall work, shorter wait times, and all process owners and customers have instant access to an application's progress.

A secondary effect of this project was that other employees in admissions, financial aid and the registrar's office asked us for help with their processes. With this project, it took one week to collect data and create both current and ideal value stream maps and another week for major changes to begin. Although we were met with skepticism and resistance at the start of the lean improvement process, within a week we had enthusiastic people wanting to get involved. Within two weeks, the university began approving similar projects for other administrative areas.

Better Than the Rest

Lean is a better way to begin improvement than are traditional quality approaches: There are fewer initial tools to learn, the whole process can be done very quickly, and the results can be more powerful than any single traditional quality improvement effort. The value stream is a richer concept than the process is; built into the value stream is a focus on customer value and the idea of a stream or flow of activities. It can include the flow of work throughout an entire supply chain or value chain or any part of it.

Lean seems to produce very quickly about 80% or more of the improvement that a traditional quality approach would produce and can produce both incremental (*kaizen*) improvements and innovative leaps (as in re-engineering). For example, changing the format of a form so it is easier to complete produces is an incremental improvement. Automating an entire process that once was done by hand could provide an innovative leap that can greatly reduce cost or increase quality.

The five main things to remember when implementing lean are:

1. Be clear on what constitutes customer value, including demand levels and times.
2. Measure time, waste, WIP or cost for each processing action and between each action when mapping the current value stream. Clearly determine which process actions add value for customers.
3. Find ways to do only what adds value and aim to do that with greatest speed or least waste, WIP or cost.
4. Find ways for the work to be done most effectively (in flow, mistake-proof, easy to do and to self-monitor).
5. Produce only what customers value, and produce it in a way that delights them.

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