Stroud Quarterly

Stroud's clients and contacts know we are all about realizing opportunity quickly, completely and permanently. Robust problem solving is a key component to achieving that. In this issue's article Solving Problems from First Principles, Taylor Milner talks about a most important part of that process: finding the best solution. Expanding on that idea, I'm pleased to share a case study about a client whose big win in the marketplace required and enabled a massive unleashing of potential. I trust you'll enjoy the story of how Stroud helped a plant that had been slated for closure to become a top performer.

As always, we welcome your feedback and ideas. Please contact us directly or visit www.stroudconsulting.com to learn more. From all of Stroud, our best regards to you for the summer.

Nathaniel Greene, Managing Partner
Stroud Consulting

In the June issue:

- **Full Article:** Solving Problems from First Principles part four
- **Case Study Synopsis:** Increasing Constrained Asset Capacity Phase 1
- **Case Study Synopsis:** Continuing our series, Increasing Constrained Asset Capacity Phase 2

Solving Problems from First Principles (four of a five part series)

STEP 4: Developing a solution
by Taylor Milner **- *follow this link for a PDF of the full article***

As the fourth article in our five-part series on the basic principles of problem solving methodologies, we'll concentrate on Step 4: Developing a solution. In this article, we'll examine the integral components of a great solution, so you can eliminate the problem completely and permanently, require as little future interaction to maintain as possible, be quick to implement, and be as low cost as possible.

In case you missed the first three articles of our series:
Step 1: Defining the Problem
Step 2: Understanding the Problem Detail
Step 3: Defining the Problem

STEP 4: Developing a solution

Once you've found the root cause, the next step is to develop a solution to the problem. With all of the time and effort that has gone into finding the root cause to the problem, this step often gets less focus; therefore, the solutions are not as robust as they could be. To understand the key principles of

this step, we need to understand the components of a great solution.
A great solution should:

- Eliminate the problem completely and permanently
- Require as little future interaction to maintain as possible
- Be quick to implement
- Be as low cost as possible

Let's look at each bullet in more detail to understand how to achieve these four goals.
Eliminate the problem completely and permanently: The best solutions completely eliminate a problem. If the problem isn't completely eradicated during the first go-around, people will attempt to continue to solve it, inadvertently making this problem (or others) worse, while spending valuable time and money that could be dedicated to other, profit-building processes.

If we have to solve the problem again, even by implementing the same solution, we did not solve it permanently the first time. Having said this, permanent solutions are more difficult to generate than one might think. For example, we once worked with a client who made toilet paper and other paper products. They had a regularly occurring problem that would stop the machine that wound the rolls of toilet paper, caused by a screw coming loose. By just tightening the screw, they could make the problem go awaycontinued to manually fix the issue every time it came loose. To solve the problem permanently, they needed to eliminate the potential for the screw to come loose in the first place. Was there a way to use Loctite, change it to a bolt and locking nut, or best yet, weld the screw in place? Those would all be far more permanent solutions than just re-tightening the screw. In the end, they chose to weld the fixture in place.

Require as little future interaction to maintain as possible: Oftentimes, it's easy to come up with a solution that requires people to do something such as check a setting, record some data, and then make an adjustment. Anytime we add human interaction to a solution, we decrease the odds of its long-term success significantly. Humans need motivation, time, and a host of other reasons to do something. We should not count on this human element to make our solution a success unless we have good set-up accountability behind the solution. It is far easier to weld a fitting in place than get a person to check and make sure that fitting is positioned properly. It may take a little time to find out exactly where to weld this fitting in place up front, but it will save countless hours in the future.

The classic example of this is the settings of rails in production lines that produce bottles and cans. The conveyors that move the bottles and cans between pieces of equipment have side rails to keep the bottles and cans from falling on the floor. These side rails are often adjustable to allow multiple sizes of bottles and cans to run on a single line. All lines have a couple of critical points where a misaligned rail causes a bottle or can to jam or fall over. This downed bottle will subsequently jam a piece of equipment, stopping the line. It is not unlikely to see a line where 5% to 10% of total time is lost to downed bottles stopping the line.

Finding and fixing this problem by adjusting a rail might take an hour once it's identified as a problem. Unfortunately, unless some focused action is taken to making the solution permanent, the problem will likely return again when the line is changed to run a different sized product or the rail is bumped or vibrates out of position. Best case scenario, the one-hour adjustment is removed and the rails are welded in one position. When this is not possible, the rails can be fitted with special change parts that only allow them to be adjusted to specific positions.

A great resource for ideas for simple, permanent solutions is in the many different cycle time reduction methods (SMED, rapid changeover, etc). These methods look for ways to accelerate cycle times by reducing and eliminating the time it takes to complete different steps in a task. The race car pit crew is the classic example of the application of one of these methods. They have found ways to reduce what might take the average person many minutes or hours down to a few seconds. These methods are a good resource because adjustments take time and eliminating them reduces the total time of the changeover process. Processes that have had SMED applied to them will often be great places to find ideas for taking adjustments out, adding permanence to our solutions.

When a solution does require human interaction, make the use of that solution the easier path to follow than not using the solution. Humans are quite predictable; we will follow the path of least resistance unless there is a significantly strong force in another direction. As Henry Ford put it famously, "Progress is not made by early risers or hard workers, but by LAZY people, trying to find easier ways to do the same." If a solution involves a person, think about what the motivations are for

that person to follow the solution. Adding work or making a process more complicated are almost certain recipes for failure.

For example, I once worked with a team that was driving improvement on a line that produced multi-wall bags that are filled with cement and other building products. We had solved a number of problems on the line that allowed the overall speed of the line to be increased by almost 30%. All of the team's trials showed that running at this elevated speed was safe, caused less downtime, and produced more throughput. The challenge was convincing the operators of the line that they could successfully run the line at this speed all the time. To lock in our solution, we programmed the line to only run at this top speed, unless it was over-ridden using a special key. We made sure the key was held by one of the team members at all times. After a few weeks, the operators were completely comfortable and calls to turn the speed down went away.

The best solutions are quick to implement: Because they are quick, they may not be as elegant or as pretty as we may want, but the sooner they are implemented, the sooner we see the impact. The best way to make a solution quick to implement is to reduce the number of people that need to be involved. For example, if you are solving a problem in a manufacturing environment for a consumer products company, keep the development of the solution only to people within manufacturing if you can. As soon as you go outside to include engineering, marketing, or sales, the time to implement goes up exponentially. By making solutions quick to implement we also reduce the amount of time we have to spend on the solution. Time is expensive, and your time is limited. Even if you are not directly involved in developing or building the solution, you will spend time following up on it and checking to see if it is on track. All of this time could be spent focused on the next opportunity.

Make the solution as low cost as possible:
Low cost solutions help further reduce barriers to implementation. They require fewer "signatures" to put in place, and therefore get implemented faster. This helps us keep the number of people involved to a minimum, and increases the ROI of our solution.

When thinking about the cost of your solution, don't forget to account for the potential negative cost impacts of your solution on other parts of the process. You would hate to solve a $100,000 problem in one area, only to cause a $1,000,000 problem somewhere else. I once worked for a client who had an issue with a casing machine jamming. The machine's job was to put eight bottles of juice into a corrugated case and seal it for shipment. The machine would jam when more than eight bottles were loaded into the case. To solve the problem, a number of changes were made to the machine to reduce the number of bottles that could enter it, reducing the pressure on the bottles being loaded and the chance that an extra one would be forced into the case. This solution almost completely eliminated the problem. Unfortunately, by significantly reducing the number of bottles the machine could hold, the amount of accumulation before the caser was reduced by 75%. This caused more downtime to be seen upstream of the caser and especially at the bottleneck of the line. The actual cost of the solution was a 15% decrease in total line productivity. In the end, we helped the client solve the jamming problem and put all of the accumulation back into the line, driving productivity up 10% from its original levels.

_____

Taylor Milner
t.milner@stroudconsulting.com

About the Author

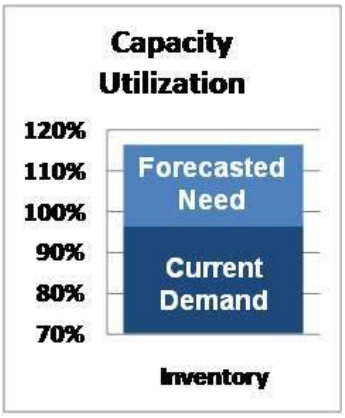
Taylor is a Partner in Stroud Consulting's North American Office based in Marblehead, Massachusetts office. He has been with the company since its founding in 2001. In his time at Stroud, Taylor has managed and led various client engagements in a diverse set of industries from food and beverage to paper and packaging to healthcare. His engagements have included work driving improvement in manufacturing operations, customer service, sales, and transportation and logistics.

Increasing Constrained Asset Capacity Phase 1

Case Study Spotlight

It was a major victory for one of America's leading beverage companies. The company had just won a multi-year, multimillion dollar contract with a national grocery chain. As the Sales organization

celebrated, the operations team moved beyond the glow to figure out how they could deliver a 23% volume increase with the existing manufacturing network in six weeks time.



To satisfy the contract, the company would need to service the demand out of a Southeast regional facility. The challenge was daunting. If successful, the plant would enjoy an incredible opportunity for increased profitability. The cost of failure, however, would be just as great. The company's new client had been clear that the balance of their national business depended upon the successful initiation of service and that failure would mean losing the entire national contract. In bidding the contract, capital plans had been developed for the filling operations but no plans had been made to address the cooler's capacity, the most constrained asset in the plant's production and fulfillment process.

The decision to engage Stroud in the project was an easy one for the leadership team. After working together to drive significant results that impacted the company's bottom line for more than three years, they were confident that Stroud's data driven process and hands on approach to driving change in the organization would provide them with the best chance to succeed.

Read the rest of the case study

Increasing Constrained Asset Capacity Phase 2

Case Study Spotlight

The insights from the Zero Based Analysis made it clear to the leadership team that the question was not if the cooler could handle the new volume but rather:

1. How could the daily business be managed to bring inventory down to the theoretical target level?
2. How could the cooler be redesigned to minimize the costly rotation of product to support FIFO inventory management?

While the team in the cooler worked to address their challenges in parallel, Stroud consultants and the production team focused on developing the technical and organizational capabilities necessary to absorb the new volume.

Read the rest of the case study

Forward this newsletter to a friend

Copyright 2011 Stroud Consulting, Ltd. All rights reserved.