CERTIFICATION PROGRAMS

Business Velocity: Part Three

BY LARRY MARTOF

Four examples of how identifying and implementing process improvements led to significant cost savings.

MUCH HAS HAPPENED in the two years since the first two parts of this series were presented in *MSC* (February 2009 and September 2009, both available at **www.aisc.org/qualitycorner**). We learned what the Global Economy means and we have seen economic stresses present everyone with many challenges. Some have won the battles and are beginning to win the war while others, unfortunately, have lost the battle. For those fighting the good fight, I hope these insights will provide ideas to drive improvements, reduce costs and enable growth for both the short term and the long term.

First a quick review. In Part One we learned that *business velocity* is an approach to providing your business with speed and direction by digging into the quality toolbox of Lean Six Sigma (LSS). How? By taking the focus of Lean (reduction and elimination of waste) and the voice of the customer focus of Six Sigma and using them together to drive improvements. We also explored the acronym DOWNTIME and how the challenges it represents relate to waste, and we introduced the LSS Toolbox and how it relates to your typical backyard mechanic's selection of standard SAE tools (Lean) and metric tools (Six Sigma) and the need to use both to get the job done.

In Part Two we investigated the use of the LSS Toolbox by aligning its tools to the phases of waste described in DOWNTIME. At the end of Part Two we introduced the *hidden factory* and the *visual factory*. These concepts will be the focus of Part Three as we show real life experiences through case studies that resulted in cost reductions, efficiency gains and bottom line improvements with significant returns on investment.

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DOWNTIME

Defects that result in rework and scrap.

Overproduction results in cost and space burden of excess inventory.

Waiting is observed in one process waiting for another process to complete before it can begin.

Non-utilized talent is the waste caused by having the wrong person in the wrong position.

Transportation waste occurs when product is moved around without any value-added activities.

Inventory waste refers to excess raw materials that are not being processed.

Motion is the wasted human movement, not having what is needed where it is needed.

Extra processing is seen in redundant steps, duplicated work or data and energy waste.

Case Study One—Paint

Problem: "We always have to buy more paint than estimated to finish the project. With bids so tight, there just isn't enough to absorb this added cost."

Solution: A review of paint records and several days of observing the painting operation revealed inconsistencies in the method used for measuring dry film thickness (DFT). The review of records against the product data sheets revealed that the required coverage rate was being exceeded by 50% to 300%. A paint manufacturer's representative was invited to conduct training for proper use of equipment, operator maintenance of spray equipment and proper technique for performing DFT measurements in accordance with the Society for Protective Coatings' standard SSPC PA-2. To provide incentive, a contest was started among all painters to determine who could consistently

Quality Corner is a monthly feature that covers topics ranging from how to specify a certified company to how long it takes to become a certified company. If you are interested in browsing our electronic archive, please visit **www.aisc.org/QualityCorner**.

apply the required DFT of product. The weekly prize was a $50 gift certificate to local venues.

Result: Training was provided by the manufacturer's representative for free (and included lunch), so the only cost was for the time spent. Properly cleaning and inspecting equipment before and after its use reduced downtime by 25%, but the real money was in paint savings. With proper cleaning, maintenance, settings, tip use, application method and consistent measurement, plus a little friendly competition, daily paint use that had been from 44 gallons to 66 gallons was reduced to from 35 gallons to 40 gallons with an average DFT of 3 mils to 4 mils instead of 4 mils to 6 mils. The company saw a savings of nearly $14,000 per month with a cost for the 12-week gift card program of $600.

Case Study One Data Sample

Coverage (sq. ft/gal)	DFT (mils)	Paint Used (gallons)	Daily Cost of Paint ($)
450	2	4.4	88
300	3	6.7	134
225	4	8.9	178
180	5	11.1	222
150	6	13.3	266

Sample based on 20 pieces of steel and 2,000 sq. ft (e.g., W21×44, 20 ft long, approx. 120 sq. ft each)

Case Study Two—Clutter

Problem: "This shop is a mess. I can't find what I need when I need it. It seems that at any time during the day, I can look out into the shop and see somebody wandering around trying to find this or that. Why doesn't anything get put back? We've also had an unknown increase in simple injuries of sprained and strained ankles, legs and backs."

Solution: Based on a time study of movement and various lean manufacturing references, a 5S program was implemented to reorganize the shop. After a one-day training session, company personnel spent two months in the Sort, Straighten and Shine phase. Two more months were spent getting to the Standardize phase, and 5S audits continue as the operation is in the Sustain stage. The program has since been rolled out to also include the office departments.

Result: The time study found that the average shop worker spent 20 minutes per day looking for tools, parts, etc. With 10 people in the shop, that equated to 16.7 hours per week. The company targeted a 50% improvement which at $50/shop man-hour would yield an annual savings of $21,000. After 120 hours spent on training ($6,000) and another $3,000 on tools, bins, etc., the post implementation time study found a 60% time savings that netted nearly $16,000 annual return on investment.

5S
Sort | Straighten | Shine | Standardize | Sustain
(and Safety, for the 6S folks!)

Case Study Three—Calibration Details

Problem: "All this calibration stuff is expensive. Sending everything out annually is a lot of added cost. Is all of this really necessary? We are just making structural steel, not airplanes."

Solution: Research shows that some tools, including measuring tapes, squares, fillet weld gages, welding machines, dry film thickness gages and temperature/humidity devices, could be checked or calibrated in-house. Others, which included the volt/amp meter and the tension measuring device (aka, Skidmore), did need to be calibrated by outside agencies. The company purchased some "master" measuring devices, updated its calibration procedures and work instructions, and set forth on a new calibration journey. Company personnel used the master certified 25-ft measuring tape to calibrate all of the shop tapes and squares. The multi-meter was used to check welding machine accuracy, and the master tape and stopwatch verified wire feed rates. These tools also were used to periodically monitor proper use of welding parameters by the welders. A certified gage block was used to calibrate a set of calipers that were used to check the DFT shims. The gage block also was used to check the surface profile gage. A certified infrared temperature device was used to check rod oven thermometers and the paint area thermometer. And finally, a humidity pack was obtained to check humidity gage.

Result: Previously the annual calibration expense had been $1,450. The initial purchase of the "master" devices was $400; the master tape requires replacement every five years and the gage block every seven. The multi-meter still requires annual calibration by a lab. The new annual calibration cost is $136, netting a first year savings of $1,050 and $1,300 each subsequent year.

Case Study Four—Wait Time

Problem: "I am sick and tired of watching people stand around waiting on an overhead crane. We added more cranes and they are still waiting around. I think we are wearing out the piece-marks put on HOLD for change orders and revisions with all of the moving around they go through. We can't just leave them in the production flow, but moving them from one end of the shop to the other and back and forth is wasting time and causing damage."

Solution: I don't want to give away all the secrets, so I will leave this one up to you, but consider this: one time study revealed that each person in the shop was spending 40 minutes per day waiting to move material. A quick calculation using the second case study scenario indicates the wait time issue could be wasting $86,000 per year of shop labor. A partial solution included the use of carts on rails, building exit paths into the production flow, conveyors, and even a good 5S program.

The *hidden factory* exists everywhere we have waste, whether it is wasted time, wasted motion, wasted costs, etc. Discovering that hidden factory makes this waste visible, allowing us to fix the problems and make improvements. Knowing where we are spending our dollars—and often wasting our dollars—makes us smarter. Then we use our "smarts" to drive improvements while gaining speed and direction, which results in greater *business velocity*. MSC