WASTE REDUCTION OF ANOTHER KIND

An industry veteran describes how the Six Sigma framework can help MRF operators, local program officials and others develop leaner processes to boost margins and bolster safety.

By Larry Christley

When you think of solid waste or recycling, the tools that come to mind are rear-loaders, roll-off containers, skid-steer loaders, sort lines and more. These tools are the backbone of our industry and are found in both public and private agencies that remove and process waste materials. Machinery helps us effectively remove waste and deliver material to an end-of-life management facility or to a materials recovery facility (MRF) for new life.

But what about the other waste? Time, efficiency, repetitive actions, and others. These are the invisible contaminants that steal from your bottom line or shrink your budget quietly in the background.

ALL STARTED WITH AN ENGINEER

In 1986, Bill Smith, an engineer working at Motorola, introduced a method to improve processes. His objective was to eliminate variation and defects from how work was being done. His target goal was to eliminate defects down to 3.4 for every 1 million opportunities (DPMO) in the production process.

Six Sigma (or 6σ) was what Smith developed. It works to eliminate the variation that causes these defects through a project approach that systematically reviews the problem; defines, measures, and analyzes that problem; develops improvements to eliminate variation or inefficiency; and then seeks to control and make the remedy sustainable into the future.

So how does this help the solid waste and recycling industries? Like every other business, we have inefficiencies that gum up our processes, our movement, our accounting, and even our management. We are typically unaware of these wastes that slowly drain our productivity and margins away. Six Sigma has the tools to track these wastes down and forever change or plug the leak in the processes that control the hemorrhage of resources.

DIVING INTO DMAIC

At the center of Six Sigma implementation is a step-by-step process called DMAIC (define, measure, analyze, improve and control). Let's quickly look at the DMAIC phases and their purposes.

The Define phase is key to laying the parameters of what you want to review. It looks at your stakeholders and seeks the sponsorship of leadership up front by telling them the expected amount of time needed, milestones and likely costs. The Measure phase starts to quantify and assess the current processes. Here, a current state process map is made that will be used in the next phase to find points of waste. This process map could show the processes involved in receiving materials through final disposition – who touches it and for how long, for example.

Next, we move to the Analyze phase, which starts looking for where variations can occur and the possible root causes of the variation. It also looks at the rolled throughput yield of the process and prepares a risk analysis. The Improve phase looks to identify recommendations for improvement and tests these recommendations to make a sound decision based on objective, tested facts.

The last phase – Control – takes the recommendation for improvements and bolsters that improvement for the future. It seeks to establish the training modules and controls needed to assure success for the future. It documents these improvements and distributes the information to those involved in the analyzed process.

TIME TO IDENTIFY

Now, what tools can you use to help boost efficiency even if you are not a belted Six Sigma certification holder? Well, let's start with TIM WOODS – not the person, but an acronym used in Lean Six Sigma to identify types of waste.

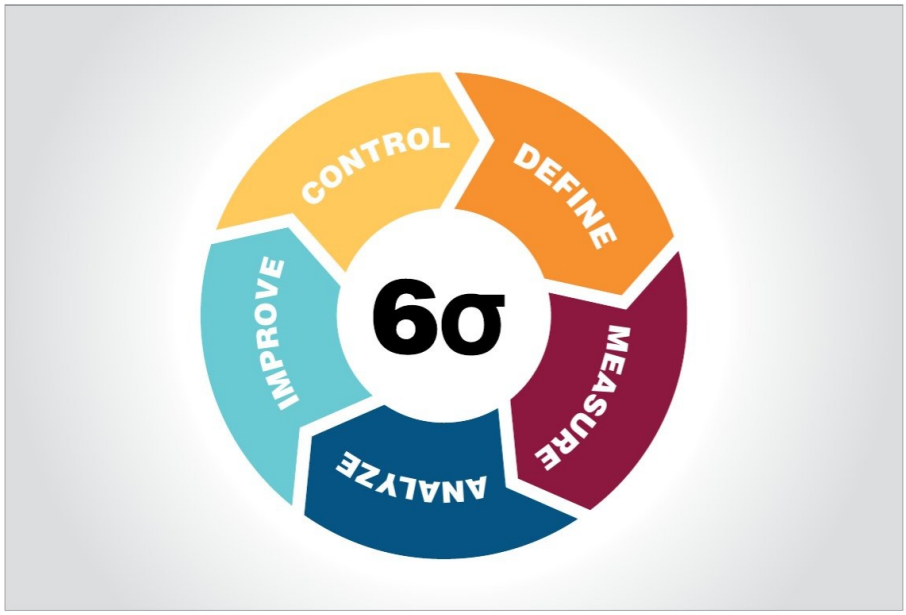
T (transportation): The unnecessary movement of materials, people and equipment often leads to wasted time and damage to equipment or property. Industry examples of this category of waste would include moving a bale twice or a hauler visiting a house twice to retrieve a late set-out.

I (inventory): Excessive inventory takes up valuable space, requires management resources and ties up capital dollars. Holding baled commodities waiting for a market change represents this concept well. Another example might be having too many collection containers or trucks sitting unused.

M (motion): Unnecessary and dangerous movement can cause harm to people, damage equipment or cause defects in a product. This might be represented by excessive repetitive motions on a sort line (essentially a worker's comp issue waiting to happen).

W (waiting): This is the waste of time that comes in waiting for people, equipment, materials and information to arrive so the work can continue. Think about the sort line when there may be gaps in the material flow. Workers may find themselves waiting for the loading of more material while a driver takes a break, or for a cart to be rolled into position.

O (overproduction): Producing more than the customer wants, needs or is willing to pay creates major inefficiencies. Think about



Six Sigma is built to identify problems across an operation's workflow and eliminate them systematically.

those old boxes of educational materials sitting in the public observation room, extra carts that sit in inventory, or the 10-year supply of payment envelopes in a stock room.

O (overprocessing): This is doing more than what the customer wants, needs or is willing to pay for. This could be as simple as an unneeded backdoor pick-up, adding extra bands on a bale, or the "perfect placement" of an overzealous driver placing a collection receptacle.

D (defects): Defective products (like commodity bales with contamination or that do not meet specifications) and defective service (missing houses on a route) often require a redo or rework that was not factored into original cost or pricing. This could also include the sign or post we backed over on the collection route.

S (skills): This waste arises when we are not using people's talent, knowledge and experience to improve the organization or operation. You remember when you had that great idea and management didn't move on it? Do you have a high-skilled person working in a low-skilled position? These are inefficiencies too.

CUSTOMER CONNECTIONS

Another tool is the Voice of the Customer Translation matrix (VOCT). We may hear our customers, but often we do not actually listen to them.

Customers can be located on the supply side (houses we service) and on the demand side (our material markets). The VOCT takes the customers' comments and identifies the need (the "what") they seek to be met, and then makes a statement that transforms into a business requirement (the "how") that will aid you in meeting their needs.

Here's how it works. Suppose a vendor says, "Your bale is a mess." That translates into a "need statement": We need to improve our baling operation. Now the business requirement: Our bale should be free of contamination and tight for this material. Once implemented, your broker is now smiling, and better returns come to you.

Suppliers often start our processes, but rarely do we ever map the entire process, even at a high level. A SIPOC, or Supplier-Input-Process-Output-Customer, will help you get the big picture. This tool helps you understand the process better or helps management to better see potential problems before they arise.

To use this tool, simply build a spreadsheet with five columns and label those columns with a S-I-P-O-C or the words they represent. Down below, start with the P or Process column. List each of your processes. Let's use tipping materials for this example. Think what is needed for the inputs to complete this process – the skid-steer loader, the truck tipping materials, the tip floor staff. Place these in the "I" column next to Process.

Each one of the above inputs is put into the process by someone or something. This is the Supplier. In this example you would have drivers, a recycling route and a floor manager.

Now let's look to the other side of the chart. When we are done with our processes, what are our outputs or products? We might have different type of bales or just one type depending on our process. This is our output. Now, who do we sell these to? In the Customer column, you would list all your possible outlets. If you just have one, you might be selling yourself short. If you have too many, you might be over-processing.

APPLICATIONS ACROSS AN ORGANIZATION

These are just a couple tools that define Six Sigma process improvement. Other tools will help you identify root causes (5-Why's), risks (FMEA), mistake proofing (Poka-Yoke), and better organization (5-S), to name a few.

When starting a project, it is critical to identify the right problem, use an objective approach, resolve the problem and then make sure the problem goes away and does not come back. Six Sigma process improvement will do just that and can be applied to your office operations, the tipping floor, a truck fleet, the sort line and virtually any other segment of a business or program.

Reducing defects can help us improve our bottom line and help eliminate potential injuries or equipment damage. It's clear that the waste hidden in our operations is just important as the waste we are moving each and every day. RR

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