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Six Sigma Busy Work

Six Sigma Article

Manufacturing firms intent on capturing and distilling rich streams of data will find them. Companies will often look at a capability maturity model (CMM) in rows and columns—a format common across many industries and many applications—in Excel. Most data dumped from a database end up in a grid, whether it's manufacturing or transactional data.

Each row may represent a part that is inspected, each column a dimension or reading. Most engineers see these data tasks as junk work that takes hours to prepare and keep up with. One manufacturing executive reported that it took 24 PowerPoint slides to document this activity, including 43 discrete steps, including two loops, one of seven steps and one of 19 steps.

"The Six Sigma community puts up with an amazing amount of busy work in order to become data-driven," says Evan J. Miller, president and CEO of Hertzler Systems. "Frequently, manufacturing executives define this data collection process as 'the every day junk work that we do that we call our jobs,'" he asserts. "The roots of this situation are deep within Six Sigma itself: Black Belts are brought into training, assigned to a project, and told to go start measuring something. They are rarely IT people, but they are smart, resourceful, and very driven. They go and get some data.

"The time this process requires is substantial," says Miller. "Even if only 20 variables are being tracked, it often takes 20 to 25 minutes to capture data for each part number. Since most companies, particularly those in metalworking production, produce multiple products simultaneously, it is easy to see how otherwise productive manufacturing professionals spend their entire time preparing reports."

Recently, an electronics manufacturer had difficulty with out-of-the-box failures of units that passed its final test, but failed when the customer opened the box. What changed in transit and whose test was right—the supplier's or the customer's?

After the company agonized over this for years, a bright Black Belt asked for seven days of data, one day for each unit that had failed at the customer site. She narrowed her search to a couple of suspected key Xs for each defect reason and discovered that although the test result for a given serial number was within specification, its difference from the other units tested on the same parameter on the same day was statistically significant. When the process spoke (instead of artificial engineering limits), it revealed when there was a defective unit.

Data collection can seem endless

Look at the steps needed to capture this data: Open a text file; record the time the sample was taken; scroll down or search for the first parameter; copy and paste, or type (probably faster) the value into a spreadsheet or other software. Then repeat the search, and copy and paste for all the suspected Xs in the file. Do that for 30 to 40 of these files. "This process is too time-consuming and too error-prone to perform on a daily basis, particularly in real time," Miller says. "Is there any wonder this organization is eager to automate this process?"

Data trump all

Six Sigma's holy grail is to be data-driven; it's a culture where truth in the form of objective statistical analysis of reliable data trumps personalities and politics. "Real-time access to accurate, actionable

data is the number one tool that has enabled us to move to a data-driven culture," says Royce Binion, operations manager for BAE Systems, Fort Wayne, Indiana.

IT solutions have only been deployed by 27 percent of the population and automated data collection by only 19 percent. Miller, a strong proponent of statistical process control (SPC) insists, "Maybe it is time to stop spending so much effort training people and instead give them the data so they can use the training."

Six Sigma teams often develop a list of critical-to-quality characteristics (CTQs) for a more efficient data collection-and-analysis system. These often include:

SPC must be used for process control in manufacturing.
SPC is the ability to automate data collection and real-time alarms in all manufacturing processes. Use existing quality data-collection processes wherever possible, as well as better support for automatic gauging, and more transparent data sharing. Process owners must be able to respond instantly to process shifts or special cause variation.

The ability to accurately track transactional process performance
The ability to track manufacturing and transactional data at the same time, with the same system is a requirement. While there clearly are differences between transactional and manufacturing data, there are also a lot of similarities. A comprehensive system that can live in both environments is essential.

A way to link information from many databases for use in operations
There's currently extensive information in various databases; a way to bridge these disparate systems is a requirement.

One source for process and product data
Once again, regardless of the source of the data, (dimensional, equipment performance, cycle times, defects, product testing), access to the data is vital.

Mistake-proofing data
Using current technology to eliminate operator data-input errors is critical along with the ability to use barcode scanning, pre-filled data fields, drop-down lists, etc.

Real-time information about all processes

Ease of use by operators, supervisors, engineers, and Six Sigma Black Belts

Compatibility with statistical analysis software

Limited resources required for initial set-up and ongoing system maintenance

For most companies that implement this type of SPC solution in a Six Sigma environment, projects are scoped, prioritized, and chartered faster in the define phase. In the measure phase, there's an average 10-percent reduction in cycle time and an almost painless transition to control. Hertzler Systems' research findings reveal that "Organizations that make sure their people have accurate, actionable data available in real-time have more effective and focused Six Sigma programs."