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## Who Needs Six Sigma, Anyway?

Six Sigma has little to offer that isn't already available through other approaches.

by D.H. Stamatis



Walt Kelly's "Pogo" got it right a long time ago: We have met the enemy, and he is us. It's unfortunate that the quality community hasn't recognized that evaluative methods



and tools don't improve quality. Organizations improve quality by using methods and tools consistently to emphasize planning and refine their designs, not by appraising quality. Quality is only improved when the organizational culture is committed to change and is willing to make quality a priority characteristic or a metric throughout the entire organization. There are no shortcuts or silver bullets. If quality matters, it should be a way of life.

It's a travesty to see so many resources being wasted in the name of quality when it's still viewed as an appraisal system. Twenty years ago, quality-methodology innovation and implementation were second to none, yet quality was (as it still is) a problem. This remained true even when the quality "gurus" (Joseph M. Juran, W. Edwards Deming, Armand V. Feigenbaum, Philip Crosby and others) introduced innovative ideas to address quality in the planning stages--that is, building quality into design, not simply monitoring it at the manufacturing level.

Similarly, ISO 9000 and QS-9000 had flashy introductions but fell short on delivery. They created a generation of overwhelming paper trails but offered no major quality breakthroughs. Organizations fell in love with the process but forgot the purpose of ISO 9000, which is to increase the effectiveness of quality systems.

We reinvent the wheel with each new quality fad, but we give it a new name in the hope that the name will help us beat the competition. Unfortunately, the more we change, the more we stay the same. We've supposedly reduced the use of in-house inspections because they're a waste of time and resources, but third-party inspection houses constitute a booming industry.

Now a new wave of quality methodology, Six Sigma, is "revolutionizing" many organizations. That's a shame--most consultants know it's simply a repackaging of old concepts, but they play along because it's highly marketed, and, for the short-term, there's a great deal of money to be made.

Six Sigma presents absolutely nothing new to the quality field of defect prevention. It's little more than an old appraisal methodology that focuses on problems after they've already occurred. Some claim it subverts the old paradigm of horizontal integration by focusing on vertical integration, but (although vertical integration, or executive accountability, is an important issue that's worth exploring) Six Sigma is not a revolutionary concept.

Six Sigma is a marketing ploy that has mesmerized many quality professionals for at least two reasons. First, it offers easy money, because both the training and qualification are controlled as though the concepts are unique and innovative and can only be understood, taught and implemented in one way. In reality, many consultants who promote the Six Sigma methodology lack consistency in their training materials and course content, and they themselves lack a knowledge base to build on. Second, Six Sigma sounds impressive because some major corporations claim exceptional returns on their Six Sigma investments. Although it's true that some companies--and they constitute a small percentage of the whole--have had exceptional returns on investment, they only experienced such a tremendous turnaround because they attacked the simplest, easiest-to-solve problems first, and their quality levels were so low that anything they tried would have been a success.

Two of the leading proponents of Six Sigma, Mikel Harry and Richard Schroeder, define Six Sigma in their book *Six Sigma: The Breakthrough Management Strategy Revolutionizing the World's Top Corporations* as "a business process that allows companies to drastically improve their bottom line by designing and monitoring everyday business activities in ways that minimize waste and resources while increasing customer satisfaction." Obviously, quality improvement and cost efficiency should be inherent in the design process, but can't this be attained with other proven initiatives? For example, organizations that follow the benchmarking process can improve their bottom line by at least 30 percent. Whatever the initiative, if top management is sloppy in defining quality expectations and is not held accountable for bad decisions, quality will suffer.

Harry and Schroeder argue that those in the financial community are impatient for results and only the Six Sigma approach will satisfy them.

It's naïve to assume that the financial community is unaware of the dangers of the abandonment and misuse of otherwise sound programs designed to improve productivity, effectiveness and employee morale. It's unlikely that this relatively new phenomenon will take over the executive culture and revolutionize organizations' bottom lines--it didn't work when the goal was at three sigma; how in the world is it going to work at the six sigma level?

The following is a list of some of the highly useful programs that have been introduced but have been implemented inappropriately because of organizational issues or internal culture wars:

- Failure mode and effect analysis (FMEA) can help identify problems before they occur. It can save billions of dollars if applied properly and appropriately. A recent case in the automotive industry, a product liability suit worth more than \$5 billion (a far cry from the average \$175,000 savings per Six Sigma project), exemplifies the importance of FMEA.
- The eight-discipline approach to problem solving is the workhorse of the automotive industry. If it's done properly, not only will problems be resolved, but they will be resolved for good. Millions of dollars, not mere thousands, are waiting to be saved.
- Value engineering/value analysis is the financial workhorse of marginal profitability. If done properly, it can save billions of dollars from design through manufacturing.
- Robust designs, in conjunction with design for manufacturability parameter and tolerance methodologies, will optimize designs and maximize profits every time, all the time. However, they must be done early in the planning stages.

Harry and Schroeder further define Six Sigma as "a disciplined method of using extremely rigorous data-gathering and statistical analysis to pinpoint sources of errors and ways of eliminating them." Again, this is nothing new--quality professionals have tried for at least the last 30 years to come up with quality metrics and methodologies to do precisely that. Most of their efforts have been wasted not due to weak tools or methodologies or statistics but due to lack of management support.

Quality gets discussed but is seldom internalized; it's usually placed on the back burner and serves only to use management power that already exists in the concepts of conformance and nonconformance and cost of quality. Quality plays second fiddle in any organization that focuses on corrective actions, and that's exactly what Six Sigma is: another prescriptive corrective action. As long as management isn't rewarded for cost avoidance, nothing will change.

Table 1 illustrates that the Six Sigma breakthrough is nothing more than a repackaging of the automotive methodologies of advanced product quality planning (APQP), problem solving and statistical process control (SPC). I challenge anyone to find any differences between the benefits of the Six Sigma model and the Quality Operating System that Ford Motor Co. introduced in the early 1990s. There aren't any. Not only is Six Sigma startlingly similar, but APQP is actually more precise because it ties all deliverables of a particular phase to a timing milestone.

**Table 1: Alternate Means of Achieving Six Sigma Goals**

Six Sigma Goals	Current and Reliable Tools
Six Sigma has eight phases: recognize, define, measure, analyze, improve, control, standardize and integrate.	A quality operating system implements each of these phases.
Six Sigma asks questions that lead to quantifiable answers that produce profitable results.	All current methodologies aim for this goal.
Six Sigma is about improving profitability, although improved quality and efficiency are immediate byproducts of Six Sigma.	SPC, DOE, theory of constraints, FMEA and other methodologies may be used to improve both profitability and quality.
Six Sigma is the philosophy and goal—3.4 defects per million opportunities.	So is the philosophy of capability, loss function and other tools. But modern tools don't deal with defects; rather, they address nonconformances. It's a subtle but important distinction, especially in the legal sense.
The Breakthrough Strategy provides the means to achieve the goal through a highly focused system of problem solving.	Benchmarking methodology does the same.
Six Sigma focuses not so much on DPMO, but on developing a systematic road map to reduce variability in a process through information assimilation and organization that increases bottom-line dollar savings.	Again, Taguchi's loss function is at work here. One may also use other statistical techniques, including SPC, to come up with reduction in variability.

The vertical integration of the top executives differs among the methodologies in Table 1, but that's a cultural issue within the organization. It's this cultural issue that prevents quality from being central in any organization. We give quality a great deal of lip service because it's "the right thing to do," but we all know that it's typically an afterthought--how else can we explain the fact that we have so much warranty cost and so many customer complaints even after so many quality programs have been implemented and so many millions of dollars have been spent in the name of quality? The answer, of course, is lack of management commitment and appropriate cultural environment for quality to grow and become part of the status quo. Because timing, production and cost are the true driving forces, we keep regurgitating old tools and methodologies to divert attention from the real problems.

Defects per unit (DPU) and defects per million opportunities (DPMO) are good examples of repackaged old tools. In fact, anybody who has done

any attribute charting will recognize them as the u-chart. Further, the concept of a "defect" takes us back at least 20 years--we don't talk about defects in modern quality; now we address our problems as nonconformities.

The automotive industry recognized the concept of the 1.5-sigma shift in the mid-1980s, evaluated it and deemed it unacceptable. Furthermore, the amount and type of shift are matters of discovery, not of assumption.

Six Sigma proponents don't understand that modern-day quality is a planning-oriented activity rather than an appraisal activity. Modern-day quality focuses on optimization of resources through robustness rather than by defining defects in a particular way. They don't understand that training in specific tools and specific methodologies won't have favorable results unless the personnel trained in the tools and methodologies are allowed to utilize them in the improvement process on a consistent basis.

Furthermore, by focusing on specification limits, Six Sigma dismisses Genichi Taguchi's loss function, which targets uniformity around a nominal with no references to specifications. Indeed, Six Sigma takes us backward.

Many programs and processes have been tried over the years. Some have been successful, some have been failures and still others are lingering. No one knows what affect the marketing blitz surrounding Six Sigma will have in the quality world. However, one thing is certain: Six Sigma is getting management's attention by promising to focus on bottom-line results. Let's hope it works this time and doesn't end up being just another flavor of the month. To succeed despite all of the methodology's shortcomings, users must accept that the major contributing factor is not so much the methodology itself but the politics of the organization's internal culture.

Will Six Sigma work in manufacturing? No one knows for sure. But let's look at the automotive industry--usually an early adopter of new quality methodologies. No one is naïve enough to believe that the automotive industry' problems will be resolved with this new methodology. After all, for the last 20 years, the top five warranty items have been the same. We know what the problems are, but no one is willing to fix them. We know that recent figures in warranty costs for the U.S. automotive companies are hovering at about \$5 billion annually per company, yet no one is really addressing these issues.

We've come to accept the notion of short-term Six Sigma as 0.001 DPMO and long-term Six Sigma as 3.4 DPMO. We've forgotten that, in practical terms, there's nothing outside of three sigma.

We don't need the Six Sigma methodology to save millions of dollars annually by avoiding tuning engines and then detuning the same engines when we couple them with the transmissions. We need to invest in

improving the transmissions rather than wasting funds in engines.

We don't need the Six Sigma methodology to save millions of dollars annually by avoiding reducing the unsold automobiles sitting on the parking lots; instead, we need to produce vehicles that meet customer requirements rather than plant counts.

We don't need the Six Sigma methodology to improve efficiency and productivity in our products; rather, we need to stop issuing "letters of deviation" and "waivers" from our specifications (especially at the product submittal warrant stage). Every time these deviations occur, we are introducing mistakes and "off specifications"--that is, nonconforming--parts. A recent study by Prescient Technologies on more than 3,300 product models from aerospace, automotive, consumer products and electronic industries worldwide showed that more than 90 percent failed company-defined standards. We are continually building products with nonconformances from the get-go without anyone being held accountable.

We don't need the Six Sigma methodology to improve throughput and timing. Rather, we need to stick to the milestones of timing and follow the guidelines of APQP. We need management's commitment for consistency and concern for improvement.

We don't need the Six Sigma methodology for transactional problems such as paying suppliers within 90 days to 120 days; rather, we need to recognize that suppliers have to be paid on timely basis.

So, what are we to do with this Six Sigma phenomenon? We need to recognize it for what it is--an appraisal tool that does nothing for prevention--and use it only when it's appropriate and applicable. It's not a panacea, and it won't bring spectacular results in most organizations. A better way to report progress on a breakthrough project is to exhibit the before-and-after pictures without any financial report manipulations. We all must understand that some cases require problem solutions rather than root-cause solutions. We need problem solvers utilizing statistical thinking, not root-cause problem solvers dealing in high-level statistical analysis. This is especially true with transactions.

To solve actual problems, it takes more than one method, one observation, one study or one experiment. To demonstrate improvement, one must wait to see the process developing and confirm the results based on verification of the "fix." Storytelling alone won't do it. We need to invest a great deal of thought and set achievable measurables on a good target to track the improvement.

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