

Six Sigma: Passing Fad or a Sign of Things to Come

Stanley A. Marash, Ph. D., P.E.

Service as the Quality Discriminator

We have been hearing more and more about entering the information age, the post-industrial age, the age of the service-oriented economy. Indeed, the trends that the developed world has been experiencing for the past few decades will undoubtedly migrate to the emerging economies during the next century. Hence, as manufacturing technologies become more and more automated and product quality becomes increasingly expected as a matter of course, the market discriminator will more and more become service.

Take, for example, the rapidly growing and highly competitive telecommunications industry. The major service providers are using the same telephone lines, cables, fiber optics networks, and airwaves, as well as hardware and software developed and produced by the same cadre of suppliers.

Moreover, the reliability and quality of these products are extremely high. Why, then, does a customer select one cellular phone service, long-distance carrier, internet provider, or paging network, over another? Cost is an obvious factor. But the costs of all these services continue to drop as the competition gets more intense, and the pricing structures are often such that there is very little difference.

In the final analysis, the key discriminator is becoming the quality of the service. This distinction is a synthesis of the hardware, software, and service reliability and accessibility. In short, its user-friendliness, its ability to satisfy and delight the customer. The question is, how do we measure service quality? Six Sigma; the quality philosophy developed by Motorola and adapted by many other corporations (notably General Electric) offers a set of tools that apply equally to design, production, and service.

Background of Six Sigma

In my 38 years in the quality profession I have been exposed to at least 40 programs that have purported to be the answer to industry's process management problems. These programs range from Zero Defects to Management by Objectives to Quality Circles to Total Quality Management to Reengineering to numerous others that I'm sure many of my readers have been exposed to. I call these "programmes du jour," because they are usually met by smug indifference on the part of middle management and staff who are confident that, given time, the program will simply fade away. What makes Six Sigma different?

First, Six Sigma is a quality philosophy based on setting attainable short-term goals while striving for long-range objectives. It uses customer-focused goals and measurements to drive continuous improvement at all levels in any enterprise. The long-term objective is to develop and implement processes, including administrative and service activities, that are so robust that defects are measured at levels of only a few per million opportunities.

Second, Six Sigma provides a measure that applies to both product and service activities: defects per million opportunities (DPMO). Historically (dating back to the 1920s), we discussed the capabilities of a business process in statistical terms as meeting three sigma. This refers to a process in which the average (mean) is fixed and the variability (sigma), when multiplied by plus and minus three sigma, encompasses 99.73% of the operations. Thus, a process capability of three sigma would have approximately 0.27% defects. If one assumes that the mean will shift by 1-

1/2 sigma, then the measure would be 66,807 defects per million opportunities (DPMO). A process of four sigma, which is approximately where many companies are today, would have 6,210 DPMO, and a six sigma process would have 3.4 DPMO.

Some readers may remember the "Zero Defects" programs of the 1960s. What makes Six Sigma any different? For one thing, Six Sigma focuses on defining measures of customer satisfaction and using teams to continuously reduce the DPMO on each measure. The number (3.4 DPMO) is so small that it is perceived as "virtual perfection." The fact that it is not zero allows people to "buy into" Six Sigma, intellectually. They will probably be willing to strive for 3 parts per million, because it is finite. If executive staff, middle managers, and others can believe this goal is possible, and communicate this belief, then there is a real opportunity for the success of this approach.

Implementing Six Sigma

One of the major thrusts in Six Sigma companies has been the creation of highly trained experts who are assigned full-time (for some period of time) to organize teams to work on improvement projects. The terms "Blackbelt" and "Master Blackbelt" were coined at Motorola to designate experts in applying Six Sigma tools. These Blackbelts take leadership in achieving significant gains by leading project teams that produce measurable cost savings. Master Blackbelts are highly successful Blackbelts who have mastered the tools and successfully applied them to a number of projects. They have also demonstrated their capability to serve as change agents.

Some companies have estimated the average savings per project as over \$175,000. As evidence of the success of the approach, GE's 1997 annual report states: "There are nearly 4,000 full-time, fully trained Blackbelts and Master Blackbelts: Six Sigma instructors, mentors and project leaders. There are more than 60,000 green belts, part-time project leaders who have completed at least one Six Sigma project." The report also states: "Already Blackbelts and Master Blackbelts who are finishing Six Sigma assignments have become the most sought-after candidates for senior leadership jobs in the company...." The question of where Six Sigma will be 20 or 50 years from now depends highly on the senior executive staff of organizations understanding that just creating teams is not sufficient unless there is a real change in the way the organization adapts to the new targets and methodologies of getting there.

Hopefully, companies will look at the holistic nature of Six Sigma and not just concentrate on training lots and lots of people. However, my prediction is that, even if it's called something else, the drive towards defining the operations that affect service quality, providing metrics for these operations, and then striving to improve them in the same way we drive hardware quality, will be one of the most significant aspects of the quality movement in the next century.

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