

It's Not Difficult to Change Company Culture Six Sigma Focuses on Total Customer Satisfaction

by Jane Erwin

If practice makes perfect, practicing the concepts of Six Sigma leads to virtual perfection.

It's a concept for now and well into the next century: focusing on the customer and not the product! And while philosopher's debate and cynics scoff whether anything can be truly flawless, the Six Sigma concept developed by Motorola is winning converts because it works. It results in a cultural change in a company, a paradigm shift towards an expectation of the highest quality, which then drives a passion for continuous improvement by all the players.

Citibank, the international financial division of Citicorp, undertook Six Sigma in spring 1997 with a goal of reducing defects in its various divisions 10 times over the first three years. The corporation already has seen reductions ranging from five to 10 times!

General Electric, which launched a Six Sigma initiative in late 1995, says the \$300 million invested in quality improvement in 1997 will deliver some \$400-500 million in savings.

Wipro Corp., a diversified Indian conglomerate headquartered in Bangalore, reports that using the six Sigma methodology during the past 15 months eliminated unnecessary steps and decreased rework, leading to an eight-fold gain over the investments made.

Motorola, whose education and training arm, Motorola University (MU) teaches the Six Sigma concepts and courses, has saved billions of dollars for its worldwide corporation by following what they teach.

"It's irrelevant whether perfection is possible," says Howie Berg, a senior MU consultant. "Companies have reduced defect rates by factors of 10 and 20 annually, when unshackled by presuppositions that it's impossible. Improve, and improve aggressively, is the vision. That's doable." Just Do It. Not only is it doable, but it should-be-done, according to Ron Randall, who as manager of quality improvement helped start the Six Sigma initiative at a Texas Instruments division.

In 1991, the executive team of the Defense Systems Electronics Group (DSEG) decided Six Sigma was the right methodology to guide improvement. The Dallas, Texas-based division has about 12,000 employees and \$2 billion in sales. (DSEG recently was acquired by Raytheon and is now called Raytheon TI Systems.)

"Many found Six Sigma appealing because it seemed to have more substance, not just `rah-rah' motivation," Randall says. "In addition to being impressed with the quantitative methods, the moment that helped cement everyone's commitment to the concept was when DSEG looked at its products and compared them to similar ones from Motorola. We were less than Four Sigma and Motorola was close to Six.

“We couldn’t believe someone was 2,000 times better than us. It really got our attention. We always were pursuing quality, we thought, but it was incremental.” Prior to implementing Six Sigma, the company had tried programs from the Crosby Quality College, Juran Institute and others, he says, adding, “These were important progressions that started us down the right road to Six Sigma.”

In 1992, DSEG received the U.S. Malcolm Baldrige National Quality Award, which Motorola won in 1988. “Winning gave a lot of validity to the Six Sigma approach. I’m confident Six Sigma helped,” says Randall.

Six Sigma proponents say that winning awards, improving quality and increasing customer satisfaction are accompanied by lower costs. It is simply a matter of survival.

In The Beginning

“If a company were to have the attitude ‘Why bother,’ I would ask them what they would do if they woke up tomorrow morning and their number-one competitor announced they had improved efficiency 10 times, improved quality 10 times and are committed to delivering a better product with better service in half the time – all at the same price?” says Bruce Hayes, an MU managing consultant. “Sound familiar? It happened to Motorola, General Motors and others in the 1970s, courtesy of Japan.”

The Six Sigma concept matured in 1985-86, growing out of various quality initiatives at Motorola. The company’s Land Mobile Products Sector established a single matrix for quality, Total Defects per Unit, dramatically changing the way management could measure and compare the quality improvement rates of all divisions. For the first time, everyone spoke the same language. Because all operations were using the same measurement, the goal for defect reduction was uniformly applied to all activities.

Sigma is a statistical expression that indicates how much variation there is in a product. A performance level of Six Sigma equates to 3.4 defects per 1 million opportunities – not perfect, but pretty close. A defect was defined as anything that caused customer dissatisfaction. A unit was any unit of work -- an hour of labor or a circuit board or a keystroke, etc.

Robert W. Galvin, chairman of the Executive Committee, Motorola Management Board, has said Six Sigma signifies near perfection.

At 99.73 percent quality, you have at least 54,000 wrong drug prescriptions each year, more than 40,500 newborn babies accidentally dropped in the hospital each year and unsafe drinking water almost 2 hours each month. In comparison, at Six Sigma quality, you’d get one wrong drug prescription in 25 years, three newborn babies dropped in 100 years and unsafe drinking water one second every 16 years. “We’ve come to expect Six Sigma and better!” Galvin adds.

Making A Change

Wipro Corp. is one company that decided to change its tolerance level. Prior to his departure, Subroto Bagchi, then-corporate vice president of Mission Quality, said it was not a difficult decision for the Bangalore, India, conglomerate. "Our international software services' customers depend on us for mission critical applications which we run on their behalf from halfway across the globe via satellite links. In the Indian market, we make soaps, computers, hydraulic cylinders and computerized tomography scanners," he notes. "Which customer is willing to live with a defect? There's no question of delivering anything less than perfect."

Chairman A.H. Premji felt that Indian industry needed to substantially upgrade its understanding and practice of quality to compete in the international market. He believed Wipro had to shift from a manufacturing view of quality to one of embracing it at all levels, so he established Mission Quality as an extension of his own office. Bagchi, then chief executive of a Software Exports division, was asked to lead the new venture.

He plunged into researching the methodologies adopted by Japanese, European and American companies. Executives had heard about Six Sigma via Wipro's partnerships with GE, so Bagchi attended a Quality Briefing at Motorola University in Chicago. This was followed by an MU team visiting India to conduct a business systems analysis in November 1996. Results were shared with top management of Wipro's five divisions and an 18-month plan was developed. The chairman and senior management had a six-day training retreat, then 12 facilitators, chosen from among successful line managers, were trained. Together with MU personnel, these facilitators trained almost 800 people between May and November 1997. This year, approximately 1,000 more employees will be trained.

"The entire scenario is like the fractal geometry exhibited in the petals of a flower," says Bagchi. "Certified trainers train people who, in turn, train others, bringing a whole new change in the way we think and work."

Wipro's corporate goal is to reach Six Sigma in every process concerning customer satisfaction by the year 2002.

Lofty, but not impossible.

Six Sigma is a stretch goal. The intent is to have continuous improvement: to keep striving. Company restructuring or pumping in a lot of new money to succeed is not the direction. Six Sigma is attainable with time and strong dedication.

Accepting The Challenge

"Before Six Sigma, we were interested in continuous improvement, but we tended to accept quality levels that merely mirrored our competitors'. We were somewhat internally focused and accepted the argument that things couldn't be made better," says Craig Erwin, quality engineering manager at Motorola Semiconductor Products Sector (SPS) in Phoenix, Ariz.

“When we started, many people thought Six Sigma was unrealistic. I was one of the people early on who wondered if we could get there. Once we understood our management team was serious about it, we accepted the challenge.”

It’s part of the SPS culture now. Six Sigma training is included in every new employee’s orientation. For those who went through training years ago, the company is refreshing its drive with a combination of classes and a renewed emphasis by senior management. Various customer satisfaction activities reward ideas and implementation.

“One thing we looked at was changes in our thought and manufacturing processes to eliminate rework,” Erwin says. “In the short term, we saw some increased costs, but in the long run, the decisions allowed us to improve our processes and apply more effective controls. We continue to see improvements in product reliability, manufacturing yields and internal quality metrics, in spite of increasing product complexity and higher customer expectations.”

Making designs more robust and reducing the opportunity for defects to creep into the final product is a one-time expense. If it’s not done, the cost of repairs, rework, excessive scrap and unhappy customers will continue through the product’s life. Product complexity is growing exponentially. Future products such as semiconductors and software will undoubtedly contain tens of millions, even billions, of elements, hence the imperative is to reduce defect rates to a few parts per billion.

“Although Motorola has made huge reductions in defect rates, we still haven’t achieved Six Sigma overall,” says Berg. “Motorola considers itself a 5.7 Sigma company now. Six Sigma is a very noble goal, but it’s the rate of improvement that’s important. Six Sigma has saved Motorola billions of dollars of costs in terms of scrap, rework, etc., enabling greater customer satisfaction – our ultimate goal.”

That got the attention of Citibank senior management. Last year, they heard a presentation by a Motorola executive on the company’s pursuit of quality. They also examined how various financial companies pursue quality, and decided to use the Six Sigma method.

“Six Sigma was appealing because it’s pretty straightforward,” says James Bailey, executive vice president and corporate quality officer for Citicorp. “It also seemed like a program that would involve everyone.”

Previously, the international corporation, which has banking centers in 200 countries, had made no universal effort in quality improvement. Various businesses and divisions within Citibank had tried different quality programs, but there was no universal language or method employed.

“Continuous improvement is our goal,” says Bailey. “We started training senior management in April 1997, and so far we’ve trained approximately 2,000 people around the world.” Five- and 10-times defect reductions have already been realized: with a decreased response time for credit card applications and fewer errors in customer statements.

"We're on track," he says. "We're more customer focused. We know it's a long road, but we've made a reasonable start and we are pleased."

Another pleased Six Sigma client is General Electric Corp. "...(Q)uality improvement, under the disciplined rubric of Six Sigma methodology, will define the way we work," its 1996 annual report announced.

A three-to-four Sigma level, average for most U.S. companies, can cost a company as much as 10-15 percent of its revenues. For GE, that would mean \$8-12 billion.

"The methodologies of Six Sigma we learned from other companies, but the cultural obsessive-ness and all-encompassing passion for it is pure GE," according to the report. "The intensity level involved in our decade-long struggle to achieve a boundary-less culture now seems 'laid-back' compared to the near monomania with which we are approaching Six Sigma quality."

GE undertook the program in late 1995, with 200 projects and massive training, then moved to 3,000 projects and more training the next year. In 1997, 6,000 projects were started. The \$200 million invested in 1996 returned nearly that much in quality-related savings. GE estimates the additional \$300 million invested in 1997 will deliver some \$400-500 million in savings, producing an additional \$100-200 million in incremental margins.

Wipro also reports successes in its first year. "First of all, we now have a common language across our divisions. People now talk about the customer, defects, Sigma level and a plan for continuous improvement," Bagchi explained.

"In India, many people have difficulty giving up the old and embracing the new. but the mind set is changing. Six Sigma is making people look outwards, and we are shifting from an organizational focus to a customer focus," he said.

The trained teams have launched close to 30 projects, including three major cross-functional undertakings that are expected to close by this March (1998). "Defects are steadily falling in cylinder manufacturing," Bagchi says. "In the fixed deposits area of our Financial Services division, we have a process in place to eliminate non-value added steps and mistake-proof the system. We're projecting a 30 percent cycle time reduction in our Computer business. The estimated near-term gains will be six to eight times the total investments we have made in Six Sigma."

The First Step

Other re-engineering programs often advocate tearing down an organization and rebuilding from scratch. MU's attitude and advice is to start where you are, build on current successes and modify your current processes. This building and modifying are done using the interwoven concepts of defect reduction, which encourages employees to relate more to each other, and using cycle time reduction, which eliminates unnecessary, non-value adding steps in the processes.

It requires more than an investment of dollars, Motorola SPS's Erwin points out. "Achieving Six Sigma takes some vision. You have to have a plan, necessary resources, the commitment of everyone and uncompromising matrices. Then you set aggressive goals along the path and hold people accountable."

The key components of the MU Six Sigma program are: - a goal of total customer satisfaction - a common language throughout the organization at all levels and at all functions - common, uniform quality measurement techniques for all business areas - goals with identical improvement rates, based on uniform matrices - goal-directed incentives for both management and employees - coordinated training in "why" and "how" to achieve the goal. There is no one set procedure. Every company is different and one must account for each organization's strengths and weaknesses and leverage them accordingly.

"We need to determine the starting points with a clear, quantitative understanding of customer satisfaction, which is typically accomplished through surveys," explains Hayes. "Surveys should identify gaps between the customer needs and the company's current performance level. Then, through the use of benchmarking, a company's core processes are compared to another best-in-class performer. This is useful in determining the first layer of needed goals."

Motorola SPS statistician Skip Weed, of Austin, Texas, has been involved with Six Sigma since the program began. "The major impact, especially when it first started, was on our culture - the people and systems that are required to produce high quality products and services," he recalls. "Previously, there was minimal effort in preventing defects rather than inspecting them out. The directive for the program came from our highly respected CEO, who was strongly behind it, and everyone then began to buy in."

Management By Facts, Not Emotion

"In a math sense, Six Sigma is a known quantity," says MU consultant Paul Zaura. "As improvements increase, expectations increase. Customer perceptions will change, and they will drive you to places you never new existed."

"You also have to look at the soft stuff, the cultural aspects, and look at changing behaviors. Many corporate cultures are fear based; mistakes are not tolerated and people learn to hide defects. Six Sigma flourishes in an open and safe environment."

TI's Randall says, "Six Sigma really will work for anybody. It's management by fact, not emotion." Six Sigma champions say there are plenty of things to count and measure and benchmark regardless of the type of business, whether it's an attorney's office or a car rental company. And within a company, you can look at all kinds of divisions - personnel policies, warehousing, security, how to run the cafeteria.

"If you're not improving, you're going down," advises Zaura. "Six Sigma is a philosophy of continuous improvement and measurement to drive the direction of goals. Its concepts are not earth shaking. Talk to your customers and find out what the defects are. Work on your big errors first. Try to decide how they happen and how you can permanently correct them."

“No matter what you do,” he says, “you do it in terms of a process, whether it’s handling paperwork or an idea or a customer call or a hard product. That’s probably one of the biggest concepts for people to grasp. Then you track your process using simple tools like Pareto, cause-and-effect diagrams and benchmarking. You compare what you have to a similar industry or process.”

Perhaps the biggest mandate of Six Sigma is NEVER REST.

Many companies who are content with their current quality level simply don’t understand the real challenge of quality. They need to determine not only the defect levels their customers experience, but also the internal defects which require rework, additional inspections, and product higher costs. Once you have a full assessment, then improvement can really begin.

And no philosopher or cynic can quibble with improvement.

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