Training for Excellence: Practitioners Give Best Practices for Teaching Six Sigma

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Six Sigma saved General Electric $1.5 billion in 1999, increased the market value of Allied Signal by 700 percent and boosted sales by more than 300 percent at Motorola.

With these kind of results, it's a wonder that Six Sigma isn't adopted by every business interested in improving performance and boosting revenue. The reason lies in the expense and time it takes to train an employee to implement this quality improvement process.

It is executed by Black Belts, employees who have undergone more than four months of training, which cost their companies a minimum of $ 10,000 per person.

And that's not all a company pays to train for Six Sigma. To do it correctly, experts recommend that the company's upper echelon receive "leadership" or "executive" training so they understand and support the process. Additionally, employees on the production floor should be trained as Green Belts a level below Black Belts so they can effectively execute Black Belts' instructions.

While the cost and effort sound daunting, particularly for small and midsized companies, when properly executed Six Sigma brings companies thousands, even millions of dollars in cost, time savings and increased revenue. Below, experts give advice and insight on training techniques that get the most return for the cost of implementing this quality improvement process.

Black Belts

Six Sigma uses statistical and other analytical tools to reduce the number of defects per million. To implement this process, a company needs to have at least one person qualified to apply the fivestep Six Sigma process: define, measure, analyze, improve and control.

Projects that can be broken down into distinct, manageable components are good candidates for Six Sigma. These include reducing the response time to customer inquiries, improving the accuracy of employee feedback by revising an internal survey, reducing the cost of improving a car's aerodynamic profile or shortening the time it takes to replace an employee.

Becoming a Black Belt usually requires undergoing extensive training in applying Six Sigma tools, which usually takes place outside of the company. Motorola is one of the few companies that provides its own training through its Six Sigma Institute at Motorola University (MU) located in Schaumburg, IL.

There are two basic approaches to implementing Six Sigma, according to Forrest W. Breyfogle III, founder of Smarter Solutions, Inc., an Austin, TX firm that offers Six Sigma training.

"One approach focuses on teaching the tools of Six Sigma," he explains. "The other on first building an infrastructure that supports Six Sigma in project selection, management of projects that lead to bottomline benefits and customer satisfaction improvements."

The latter emphasizes making Six Sigma tools applicable to the projects that attendees bring to the course, which in Breyfogle's opinion makes it "by far the most effective approach for implementing Six Sigma."

With this approach, which takes four months to complete, participants are required to come prepared with a specific project to work on and a laptop computer loaded with Minitab, or other statistical software, and Microsoft Office. The training typically alternates between one week of classes followed by three weeks of applying the newly learned tools to the selected project. Six Sigma training providers typically offer onsite coaching and mentoring for an extra charge.

"In our training, we like to discuss how Six Sigma techniques are best applied to real projects that are brought to the training sessions," Breyfogle explains. "We believe that an understanding of how Six Sigma tools build upon each other is essential. At the beginning of our week two, three and four sessions, we review possible linkages of these tools. We have also found that attendees really like how our training links directly to sections of our book."

Breyfogle uses his own book Implementing Six Sigma: Smarter Solutions Using Statistical Methods, (Wiley 1999), as the text for his classes.

Instruction in various Six Sigma courses include process mapping, causeandeffect diagrams, failure mode and effects analysis (FEMA), process capability analyses, probability, hypothesis testing, analysis of variance, regression, design of experiments (DOE) and statisticalprocess control (SPC).

"Some Six Sigma providers teach Six Sigma metrics using a onesize-fitsall strategy," Breyfogle says. "In my classes, I have noticed that this can lead to students forcing certain measurement techniques to projects where they don't fit. That can be detrimental, because it causes frustration and can lead to the wrong set of actions."

Breyfogle prefers that organizations create a set of metrics appropriate to a particular project.

There are less expensive ways to learn Six Sigma. Some companies opted to adopt the aforementioned first approach and simply to learn the statistical tools required to determine defects per one million opportunities. Instruction on using these tools is now readily available on software programs and various books. But if expert guidance during training and implementation is not available, and company leaders are leery of the changes required in implementation, most will fail in their attempts, experts say.

"An unsuccessful Six Sigma training session occurs when just the tools and mechanics are taught with no plan on how to apply them," says Breyfogle. "[Six Sigma] won't be implemented because people are not asking questions that lead to their maximum utilization."

At the end of the four months, participants present their projects and describe how much they saved their companies in money and production time, or earned in increased revenue. After successfully completing several more projects, a Black Belt is eligible to undergo training to become a Master Black Belt, considered to be the highest degree of proficiency.

After a Six Sigma project is implemented, the last phase, control, starts. The work involved in a Six Sigma project identifies key process input variables that affect process and product criticaltoquality (CTQ) characteristics. After a project is completed, the process input variables are monitored and controlled so that the benefits of a project are sustained after implementation is complete.

Six Sigma = big changes ahead

It's understandable that workers on the production line who are affected by changes proposed during Six Sigma implementation be trained to understand the process, but is it so important that the CFO and CEO cost the company thousands of dollars to learn how to get involved? Given the ambitious goal set by Six Sigma, and the degree of change necessary to attain it, the answer from experts, trainers and consultants is always in the affirmative.

To reach this objective, companies must go beyond simply fine tuning existing systems, or teaching workers new skills, and be willing to throw out old processes and methods and start fresh. This is where teaching the company's top executives about Six Sigma plays an important role.

Six Sigma training for company leaders usually takes place in oneto twoday workshops called "Executive Overview," "Senior Executive Program" or "Leadership Training." The purpose of these classes is the same, to gain support and assistance from upperlevel executives by teaching them about Six Sigma and the implementation process.

Six Sigma Qualtec, a training organization in Tempe, Ariz., offers a leadership symposium and an executive overview, two twoday long courses that introduce company leaders to the process. The courses include case studies, explain related terms and provide each participant with a "leadership tool kit" which includes the statistical software used in determining defect rates.

Executives are also shown examples of Black Belt final reports and deployment strategies, the implementation process, successful examples of Six Sigma application and how to benchmark results.

By giving senior managers and executives a clearer picture of the process, leadership training helps them be better leaders in implementing Six Sigma. The training enables senior managers to participate in selecting potential Six Sigma projects and Black Belt candidates and ultimately take more ownership, says Breyfogle, whose company also offers leadership training.

"The reason that Six Sigma is now the "in thing" is because of GE's success with it," he explains. "GE's success with Six Sigma resulted because they created an infrastructure that supported Six Sigma methodologies."

Requires commitment

Successful implementation of Six Sigma requires a major obligation on the company's part both during and after Black Belt and leadership training Because Six Sigma is a continuous improvement process, and works best on a per-project basis, Black Belts are best utilized if they aren't returned to their old positions but rather are reassigned to oversee quality improvement projects.

"Six Sigma is not a product you can buy," Motorola's senior corporate vice president and quality director Dennis Sester told the Harvard Management Update. "It's a commitment."

The companies that have had success with Six Sigma say their efforts have been rewarded with significant savings from improved efficiency and quality. Savings usually start at $75,000 per project. Overall, the benefits for companies have been much higher. Polaroid increased annual sales by $1 million because of Six Sigma and Navistar, a truck components manufacturer, saved more than $20 million in the two years that it implemented Six Sigma through Six Sigma Qualtec.