Harrington Institute Inc.

Six Sigma Methodology

The Issue

Customer's expectations related to products and services have continued to increase. As soon as an organization "wows" the customer with a better product and/or service, it becomes the standard and the customers begin to look for organizations that perform at a higher quality level. In WWII acceptable defect levels of 1, 2 or even 5% was the norm. When we bought a car, we planned on coming back with a long list of things that needed to be corrected. Then, the Japanese auto industry showed us that better autos could be produced in large quantities. They also showed us that televisions, radios, steel, and many other products could be produced at high quality levels without increasing cost.

America reacted with a series of quality improvement initiatives - first, total quality control, then zero defects, followed by total quality management, and process reengineering. In the 1990s ISO 9000 systems became the "in" thing to do and now Six Sigma is the latest improvement approach. Each time that a customer demanded a significant degree of improvement in quality, a new methodology was developed, or, to put it more correctly, another methodology evolved. The standard for quality today has increased from 2% defective in the 1940s to 00.0003% defective. To meet this high quality requirement, a drastic change in the processes that we use was necessary. Organizations can inspect and reject parts, but the defect escape rate runs about 10%. We have often heard, "You can't inspect quality into a product". Until the Six Sigma methodology was accepted by business, processes that were capable of producing no more than 62 defects per 100,000 units was acceptable. Now, a Six Sigma process will be able to produce no more than 0.034 defects per 10,000 units produced. This type of performance is now expected not only from production, but also from internal support departments and service organizations.

The Solution

The Six Sigma methodology is focused on the use of simple statistical methods to analyze, measure, and improve the performance of all the processes throughout the organization. All employees are trained to understand the Six Sigma principles and to successfully apply the core strategies to their processes. Upon completing the course, they are given the title of *Green Belt*. Selected employees are chosen to attend an advanced training program. Typically, these training programs are given one week per

month over a four-month period. Between the classes the students are assigned to use the tools that they were taught during the class. At the end of the four months, if they successfully complete the class, they are awarded the title of *Black Belt*. They are then turned loose with a mission to seek out and destroy problems that are plaguing the organization.

The Harrington Institute teaches classes for Green and Black Belt. In addition, we serve as Master Black Belts in helping to implement the Six Sigma methodologies at our clients' sites.

We agree with Frederick R. McFadden that the Six Sigma methodology is more than just statistical analysis and problem solving; it is made up of two major elements.

I. Basic Concepts
   - A. Improvement Process
     1. Define products and services
     2. Identify customer requirements
     3. Compare product with requirements
     4. Describe the process
     5. Improve the process
     6. Measure quality and productivity
   - B. Quality Measurements
     1. Process mean and standard deviation
     2. Capability index C_p and C_{pk}
     3. Defects per unit (dpu)

II. Imbedding Initiatives and Tools
   - A. Quality Initiatives
     1. Participative management
     2. Short-cycle manufacture
     3. Design for manufacturing
     4. Benchmarking
     5. Statistical process control
     6. Supplier qualification
   - B. Improvement Tools
     1. Quality function deployment
     2. Flowcharts
     3. Pareto charts
     4. Histograms
     5. Cause-and-effect diagrams
     6. Experimental design

If you would like a more detailed understanding of the Six Sigma methodology, it can be downloaded from our web-site @ www.harrington-institute.com. For help in implementing a Six Sigma methodology, contact us on our web-site or call us at:

(800) 698-4270