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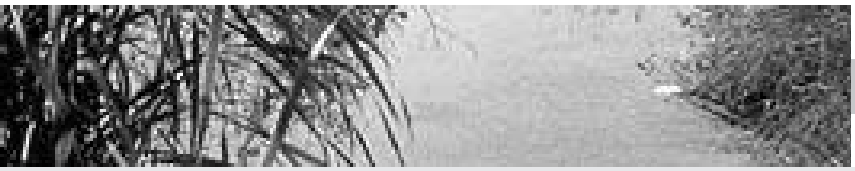

Six Sigma, Black Belts and Actuaries

by Xin Liu

We all have heard about Six Sigma and its many success stories. I, in particular, have heard a lot from my husband. As a Black Belt of the Six Sigma projects, he is a firm believer of the methodology. His enthusiasm and deep involvement in his projects often generate many interesting discussions over our dinner table. To me, what he does draws a lot of similarities to what we do as actuaries—define a problem, measure and analyze it quantitatively, set up models or procedures and evaluate/measure the success rate. He takes a lot of pride in his work and his projects, and he is also well rewarded for the results of the projects at the end of the year. That's why it inspired me to learn more about the Six Sigma methodology and the role of the Six Sigma Black Belts.

What is Six Sigma?

By definition, Six Sigma means six standard deviations; it is a measure of quality that indicates no more than 3.4 defects per million opportunities. Like many other initiatives we have seen in the past, the goal of Six Sigma is to increase customer satisfaction, reduce cost and ultimately, to improve the bottom line. The fundamental difference between the traditional approach and Six Sigma is best summarized in the following chart by Dr. Mikel Harry and Mr. Richard Schroeder at Six Sigma Academy in their book entitled *SIX SIGMA—The Breakthrough Management Strategy Revolutionizing the World's Top Corporations*.

As we can see from the chart, Six Sigma is a structured, data-driven, problem-solving approach using rigorous data-gathering and statistical analysis. It requires the culture change and total commitment from the top management to empower the project teams.

How does Six Sigma work?

As an actuary, I would like to summarize Six Sigma in the following equations:

Six Sigma = People Power + Process Power

People Power = Executive Leadership + Champions + Master Black Belts + Black Belts + Green Belts

Process Power for existing process = Define + Measure + Analyze + Improve + Control (DMAIC)

Process Power for new process = Define + Measure + Analyze + Design + Verify (DMADV)

People Power

One of the most important elements of Six Sigma is the role everyone plays. The Executive Leadership is the driving force behind adopting the Six Sigma philosophy throughout the whole organization. The executive leader selects individuals who will champion Six Sigma within specific business units across the organization. They oversee, support and fund the Six Sigma projects and ensure personnel necessary to get the job done. The Champions select Master Black Belts to act as in-house experts for disseminating the Six Sigma knowledge throughout the organization. Master Black Belts devote 100 percent of their time to Six Sigma, assisting Champions in identifying improvement projects, training and coaching Black Belts and Green Belts and communicating the overall progress and the status of projects within their areas of business. Black Belts work under a Master Black Belt, applying the Six Sigma's tools and knowledge to specific projects. Like

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Master Black Belts, Black Belts dedicate 100 percent of their time to working on Six Sigma projects and undergo extensive training in statistics and problem-solving techniques. Black Belts are also responsible for training Green Belts. Green Belts are employees throughout the organization who execute Six Sigma as a part of their overall jobs. They do much of the legwork in gathering data and executing experiments in support of Black Belt projects and focus on projects that tie directly to their day-to-day work.

Process Power

There are two basic Six Sigma methodologies: DMAIC and DMADV. The DMAIC process (Define, Measure, Analyze, Improve and Control) is an integral improvement system for existing processes falling below specification and looking for incremental improvement. The DMADV process (Define, Measure, Analyze, Design and Verify) is an improvement system used to develop new processes or products at Six Sigma quality level.

There are many Six Sigma consulting firms specializing in providing training and software support for deploying the Six Sigma methodology.

Who Uses Six Sigma?

The concept of Six Sigma was originated by a group of engineers at Motorola to measure and increase the quality levels in the early and mid-1980s. Since then, hundreds of companies around the world as diverse as AlliedSignal, General Electric, Sony, Honda, Maytag, Raytheon, Texas Instruments, Bombardier, Canon, Hitachi, Lockheed Martin, Polaroid, Johnson&Johnson, Fidelity Investments and Caterpillar Inc. have adopted Six Sigma as a way of doing business. The most notable success is General Electric led by Jack Welch. The operating margin reached 16.7 percent in 1998 up from 13.6 percent in 1995 when GE implemented Six Sigma.

What can Six Sigma do for the insurance industry?

The Six Sigma methodology can also benefit the insurance industry. With the competition in the insurance industry becoming more and more intensive, companies are investing huge sums of resources in developing cutting-edge products, searching for alternative distribution channels and undertaking other initiatives. It will take years for the investment to break even.

ISSUE	CLASSICAL FOCUS	SIX SIGMA FOCUS
Analytical Perspective	Point estimate	Variability
Management	Cost and time	Quality and time
Manufacturability	Trial and error	Robust design
Variable Search	One-factor-at-a-time	Design of experiments
Process Adjustment charts	Tweaking	Statistical process-control
Problems	Fixing	Preventing
Problem Solving	Expert based	System based
Analysis	Experience	Data
Focus	Product	Process
Behavior	Reactive	Proactive
Suppliers	Cost	Relative capability
Reasoning	Experience based	Statistically based
Outlook	Short-term	Long-term
Decision Making	Intuition	Probability
Approach	Symptomatic	Problematic
Design	Performance	Productivity
Aim	Company	Customer
Organization	Authority	Learning
Training	Luxury	Necessity
Chain-of-command	Hierarchy	Empowered teams
Direction	Seat-of-pants	Benchmarking and metrics
Goal setting	Realistic perception	Reach out and stretch
People	Cost	Asset
Control	Centralized	Localized
Improvement	Automation	Optimization

Many companies have a well carved out product development process and a very committed product development team to roll out new products periodically. How about the other side of the coin? How about taking care of the investment made in the past—to squeeze out every penny from the dollar already spent? I am talking about still doing what we are doing now but doing it faster, cheaper and with fewer errors. In Six Sigma terminology, this is called "increasing customer satisfaction and reducing cycle time."

The systematic approach of Six Sigma can be applied to improve the existing business process (e.g., underwriting/issue, customer

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service and administration), increase efficiency and reduce errors to minimum. There is a lot of room for improvement in the existing process. Besides having a product committee developing and managing those excellent new products and spending the money, how about adding a process improvement committee? For every dollar spent, make it well spent; for every customer, keep and make him/her a satisfied customer!

Actuaries can be good Black Belts!

I think actuaries are well suited for the roles of Black Belts. By default, we have excellent statistical/quantitative and problem-solving skills, which is an essential requirement of the Six Sigma process.

A Black Belt must be technically competent, bottom-line driven, customer-focused, a good project manager and be able to train and develop people. Above all, he/she must take ownership of the projects. Does it sound like a GOOD actuary at work? If your company has adopted Six Sigma, try to become a Black Belt. It will be an invaluable career booster. If your company has not implemented the Six Sigma, try to adopt the Six Sigma Black Belt work attitude and method for yourself; you will find you are investing for a bright future.

I am very interested in hearing from people involved in Six Sigma projects in the insurance industry, to see how Six Sigma works in the insurance companies and the roles of actuaries in the Six Sigma projects. ❑

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cases, it is not always so. An example is given that Sir Edmund Hillary was the first to climb Mt. Everest, yet the leader of that expedition was John Hunt.

The Position Myth: This myth is the belief that those in leadership positions are leaders. Many counter examples are given, along with the reasons why some people without leadership positions are actually leaders and those with leadership positions are not necessarily leaders.

In general, the second law gives a lot of food for thought and explains why certain people are perceived as leaders while others are not.

The last law I will discuss is the "Law of Navigation." This law expands on the management myth mentioned before. The important point discussed in this chapter is that anyone can steer a ship, but it takes a leader to chart the course. Maxwell brings the point home with a comparison of the two teams who were trying to be first to reach the South Pole. The leader of the first team carefully chartered his course, studied the ways of experienced travelers in these regions, recruited the best people and set up supply points to ensure a successful trip. The leader of the second team did not plan anything and decided to use all the wrong resources for this trip. The result? The first team reached the South Pole and came back safely, while everyone on the second team endured a difficult trip and all died as a result of trying to return from the South Pole. I liked this chapter in that the examples given were good reading and the idea that planning pays off.

If you have any interest in becoming a leader, I recommend Maxwell's book. It provided important insight into the qualities of leaders. A lot of it came across as common sense, but it's only common sense that comes from experience. ❑

Bibliography:

John C. Maxell. 1998. *The 21 Irrefutable Laws of Leadership*. Nashville: Thomas Nelson, Inc.