The Evolution of Six Sigma

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Before, January 15, 1987, Six Sigma was solely a statistical term. Since then, the Six Sigma crusade, which began at Motorola, has spread to other companies who are continually striving for excellence. While it is progressing, it has extended and evolved from a problem-solving technique to a quality strategy and ultimately into a sophisticated quality philosophy. However, this unique philosophy only became well known after GE's Jack Welch made it a central focus of his business strategy in 1995. Today, Six Sigma is the fastest growing business management system in industry .

To elaborate the evolution of Six Sigma, one Six Sigma authority has to be introduced: Mikel Harry, who is called the "godfather" of Six Sigma and is acknowledged as the leading authority on theory and practice. Even though he did not invent the concept, the way that it is currently practiced bears the unmistakable marks of Harry's personality and personal history. Harry's history path is followed here to reveal the evolution of Six Sigma.

The evolution began in the late 1970s, when a Japanese firm took over a Motorola factory that manufactured television sets in the United States and the Japanese promptly set about making drastic changes to the way the factory operated. Under Japanese management, the factory was soon producing TV sets with 1/20th the number of defects they had produced under Motorola management. Finally, Motorola recognized its quality was awful. Since then. Motorola management decided to take quality seriously. When Bob Galvin became Motorola's CEO in 1981, he challenged his company to achieve a tenfold improvement in performance over a five-year period.

In 1984, after Harry was awarded a doctorate from Arizona State University, he joined Motorola where he worked with Bill Smith, a veteran engineer who was in Mikel Harry's words, "the father of Six Sigma". During 1985, Smith wrote an internal quality research report which caught the attention of Bob Galvin. Smith discovered the correlation between how well a product did in its field life and how much rework had been required during the manufacturing process. He also found that products that were built with fewer nonconformities were the ones that performed the best after delivery to the customer. Although Motorola executives agreed with Smith's supposition, the challenge then became how to create practical ways to eliminate the defects. With the concept of "logic filter", one of Harry's papers at Arizona State University, together with Smith, Harry developed a four-stage problem-solving approach: Measure, Analyze, Improve, Control (MAIC). Later, the MAIC discipline became the road map for achieving Six Sigma quality.

On January 15, 1987, Galvin launched a long term quality program, called "The Six Sigma Quality Program". The program was a corporate program which established Six Sigma as the required capability level to approach the standard of 3.4 DPMO. This new standard was to be used in everything, that is, in products, processes, services and administration. The Corporate Policy Committee of Motorola then updated their quality goal as follows:

"Improve product and service quality ten times by 1989, and at least one hundred fold by 1991. Achieve Six Sigma capability by 1992. With a deep sense of urgency, Galvin spread dedication to quality to every facet of the corporation, and achieve a culture of continual improvement to assure Total Customer Satisfaction. There is only one ultimate goal: zero defects in everything we do."

The revised corporate quality goal stated that everyone was responsible for and to each other regarding this objective. In addition, it affirmed that no one could assume she or he had done enough until the entire goal of Six Sigma was achieved company-wide. After implementing Six Sigma, in 1988, Motorola was among the first recipients of the Malcolm Baldrige National Quality Award. Since then, Six Sigma has constantly caught the attention of industry. However, at Motorola, Six Sigma was only a disciplined problem-solving methodology.

In 1988, at Unisys Corp. Harry discussed with Cliff Ames, one of Unisys' plant managers, about how to leverage the Six Sigma technique throughout an organization and how to recognize the people who were equipped with Six Sigma tools. Since Ames was a lover of karate and Harry himself was a martial arts enthusiast, in some respects, they shared the same eastern martial arts philosophy. People in martial arts are incredibly skilled, have a precise command of tools, are very dedicated, and are very humble to learn. Based on this insight, Harry decided to designate those with Six Sigma skills as "Black Belt".

In 1989, Galvin invited Harry to head up Motorola's Six Sigma Research Institute and challenged him to do "short cycle quality knowledge transfer and rapid dissemination of quality knowledge into a world-wide company". Harry answered the challenge with Six Sigma implementation strategy that attempted to put quality tools into the hands of large numbers of workers and managers throughout the organization. From that moment, Six Sigma skills were not solely owned by quality engineers, but began to transfer from the quality department to the entire organization.

In 1993, at Asea Brown Boveri (ABB), Harry teamed with Richard Schroeder who later joined him to found Six Sigma Academy. Inspired by Kjell Magnuson, one of ABB's business unit presidents, Harry realized that high level executives only focused on clear and quantifiable gains. Further, Harry recognized that it should not be quality first, but business first which will lead to the realization of quality. In addition, from his Marine Corps experience, he understood the importance of tactics. To exploit the full power of Six Sigma by focusing on bottom-line results, Harry refined Six Sigma deployment tactics which included: Champion, Master Black Belt, Black Belt, and Green Belt.

At that time, enamored by Motorola's success, several other companies, such as Texas Instruments, began a similar pursuit. But, it wasn't until late 1993 that Six Sigma really began to transform business. That's the year that Harry and Schroeder moved to Allied Signal and its CEO, Larry Bossidy, decided to adopt Six Sigma.

By adequately selecting the right Six Sigma projects and promptly providing the right support for them, Bossidy suggested that high level executives should also understand Six Sigma tools. To respond to that, Harry developed a methodology for a leadership team to select high financial leverage projects. At Allied Signal, an entire system of leadership and support systems began to form around the statistical problem solving tools of Six Sigma.

Not long after Allied Signal began its pursuit of Six Sigma quality, Jack Welch, then Chairman and CEO of General Electric, influenced by Bossidy, then began to get interested in Six Sigma. In fact, before Six Sigma, according to Welch, neither he nor Bossidy quality enthusiasts. They felt the earlier quality programs were too heavy on slogans and light on results. In June 1995, Welch invited Bossidy to attend GE's Corporate Executive Council meeting and share his experience with Six Sigma. After that meeting, GE conducted a cost-benefit analysis on Six Sigma implementation. The analysis showed that if GE, then running at three to four sigma quality level, were to raise its quality to six Sigma, the cost saving opportunity was somewhere between $7 billion and $10 billion. This amounted to a huge number - 10 to 15 percent of sales.

Then, in January 1996, teaming with Six Sigma Academy, Welch announced the launch of Six Sigma at GE. At that time, he called Six Sigma the most ambitious undertaking the company had ever taken on. He stated: "Quality can truly change GE from one of the great companies to

absolutely the greatest company in world business." Needless to say that when GE does something, it does it all the way. Welch said to GE's Corporate Executives: "Everyone in this room must lead the quality charge. There can be no spectators on this. What took Motorola ten years, we must do in five - not through shortcuts, but in learning from others". From that moment, Jack Welch became the global promoter of Six Sigma.

There are two important contributions from GE's way of implementation to the evolution of Six Sigma. First, Welch demonstrated the great paradigm of leadership. Second, Welch backed the Six Sigma program up with a strong rewards system to show his commitment to it. GE changed its incentive compensation plan for the entire company so that 60 percent of the bonus was based on financials and 40 percent on Six Sigma results. The new system successfully attracted GE employees' attentions to Six Sigma. Moreover, Six Sigma training had become a prerequisite for advancement up GE's corporate ladder. Welch insisted that no one would be considered for a management job without at least a Green Belt training by the end of 1998.