

# Introduction to Six Sigma for Small to Mid-Sized Companies

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An Executive Brief  
from Six Sigma Qualtec



*“Six Sigma is the only program I’ve ever seen where customers win employees are engaged in and satisfied by, shareholders are rewarded – everybody who touches it wins.”*

- Jack Welch, past-Chairman of GE

For over a decade, major corporations in all industries have used the discipline of Six Sigma to increase their market share, raise revenue, improve profit margins and, ultimately, shareholder value. It is credited with saving billions of dollars while simultaneously improving overall quality and customer satisfaction. As it has matured, Six Sigma has evolved into a management process capable of addressing virtually any problematic system or process within an organization.

Commonly perceived as a performance improvement strategy available only to the largest manufacturers in the world, the power of Six Sigma can also be harnessed to provide breakthrough levels of productivity and financial performance to small and mid-sized companies. Enterprises with 1,000 or fewer employees can apply the tools, skills, practices and disciplines followed by industry giants – and achieve the same benefits.

Few companies have a Jack Welch type leader that can rally the troops to battle simply by stating orders. Most companies have an ingrained culture that embraces change only after results are demonstrated and sustained. Also, most mid-sized organizations tend to operate very “lean” operations, requiring considerable emphasis on doing things faster, cheaper, and through the path of least resistance.

When implemented properly, Six Sigma can be a driving force in a company of any size. As with any change program the corporate ranks are filled with failed deployments from companies not learning from the mistakes and success of those who went first.

This Executive Brief outlines Six Sigma concepts and discusses its fitness for use in small and medium-sized companies. Properly deployed, Six Sigma will provide a small work environment with the same benefits realized by the mega-corporations, without placing a major drain on human resources, budgets or production capabilities. Simply stated, Six Sigma means improving the way you run your business. It is not a “quality” program; it is a business management system.

## What is a “Sigma,” and Why “Six”?

**Sigma**, a character in the Greek alphabet, is used in mathematical statistics to define standard deviation. Standard deviation indicates how far away a measured result is from the average (figure 1).

When you have achieved Six Sigma for a particular process, both your upper and lower specification limits are six standard deviations from the mean. In technical terms, Six Sigma means that there are 3.4 defects per million events. A “defect” is defined as anything outside of customer specifications.

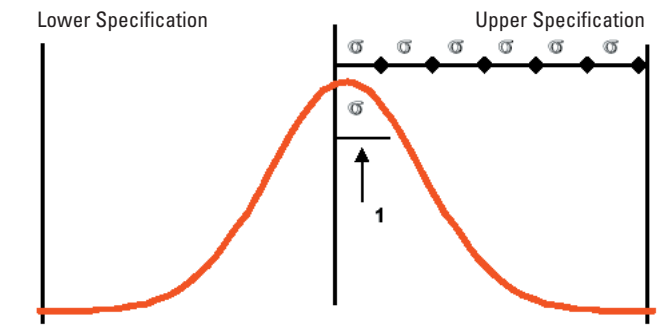


Figure 1.

The fundamental objective of Six Sigma methodology is the implementation of a measurement based strategy that focuses on **process improvement** and variation reduction through the application of Six Sigma tools. As a way of running a business, Six Sigma is a highly disciplined process which helps companies and individuals develop and deliver near perfect products and services. It is an enterprise-wide strategy that effectively develops a capability and a desire within individuals to improve decision-making, solve business problems and improve the overall performance of the enterprise.

## Six Sigma Methodology

Six Sigma holds the philosophy that every process can and should be repeatedly evaluated and significantly improved in terms of time required, resources used, quality performance, cost and other aspects relevant to the process. It prepares employees with the best available problem solving tools and methods. At its core, Six Sigma utilizes a systematic five-phase problem solving methodology called DMAIC: Define, Measure, Analyze, Improve and Control (figure 2).

**Define** – At the preliminary stage poorly performing areas are identified and prioritized for improvement. Projects are defined and launched with well-articulated problem and objective statements that have a beneficial impact to the organization.

**Measure** – At the preliminary stage, great care must be taken to identify a suspected problem process that is within practical realms of control. Is improving a particular process aligned with the organization’s strategic goals? How will you know when and if you’ve been successful? What is the capability of the process? Using process mapping, flow charts and FMEA (Failure Mode Effects Analysis), original data is collected that will act as a baseline for monitoring improvements.

**Analyze** – When, where and why do defects occur? This phase applies appropriate statistical analysis such as scatter plots, Input/Output matrices and hypothesis testing to accurately understand exactly what is happening within a given process.

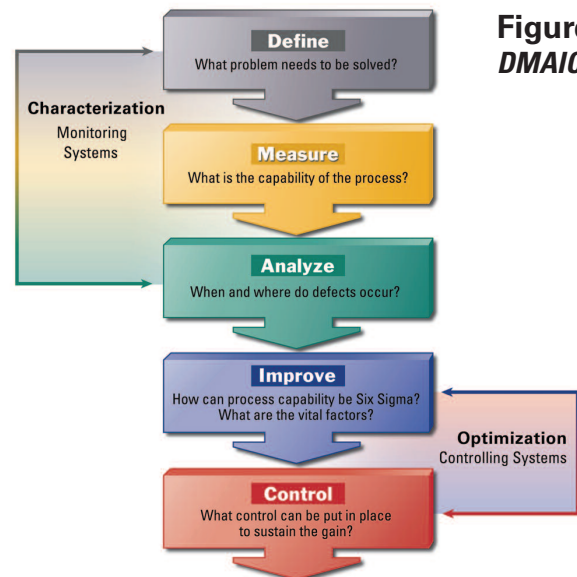


Figure 2. DMAIC

**Improve** – In this phase, vital factors in the process are identified and experiments are systematically designed to focus on those that can be modified or adjusted to reach targeted goals.

**Control** – The Control phase incorporates the basic tools of Statistical Process Control to manage processes on a continual basis. Once the DMAIC process has begun, it must be managed continually to assure that benefits are sustained.

## The Players

In the Six Sigma environment, participants – from senior management to factory floor workers – assume specific roles in the performance improvement process. The Champion, Master Black Belt, Black Belt, Green Belt and Yellow Belt (figure 3) each have unique perspective on a business' strategic priorities, key processes and the organization's culture.

**Champions** are responsible for coordinating a business roadmap to successfully achieve Six Sigma within their organization. They are responsible for the resources and other business aspects of a Six Sigma project. Champions select and scope projects that are aligned with the corporate strategy, choose and mentor the right people for the project, and remove barriers to ensure the highest levels of success.

**The Master Black Belt** sits atop a skill and knowledge hierarchy that includes Black and Green Belts, with gradually increasing levels of sophisticated tool sets at their disposal. The primary activity for the MBB is being a leader and teacher. As a leader, the MBB will have responsibility for overseeing projects with multiple Black Belts and Green Belts participation that will significantly change the way the organization does business. As a teacher, the MBB is responsible for the on-going development of existing Black Belts as well as the development of new ones.

**The Black Belt** is a key change agent for the Six Sigma process. Typically these highly qualified individuals lead teams working on chronic issues that are negatively impacting the company's performance. The Black Belt is usually assigned to a two-year dedicated position responsible for executing the Six Sigma process on selected projects.

**Green Belts** serve as specially trained team members within a function-specific area of the organization. This focus allows the Green Belt to work on small carefully defined Six Sigma projects, requiring less than a Black Belt's full-time commitment to Six Sigma throughout the business.

**Yellow Belts** represent a large percentage of your workforce is trained with skills necessary to identify, monitor and control profit-eating practices in their own processes. They are also prepared to feed that information to Black Belts and Green Belts working on larger system projects. The training of Yellow Belts builds and sustains the Six Sigma culture.



**Figure 3**

## Large and Small Scale Deployment

Larger corporations involved in a full Six Sigma deployment will appoint a dedicated individual, reporting to an executive, to deploy Six Sigma. These individuals, depending on the size of the deployment may also have a limited staff (2-4 people) assisting them in this activity. This “Deployment Champion” and their staff may be made up of full-time Master Black Belts or Black-Belts, who will have the responsibility of providing internal training and support, working on complex problems, and providing general advice to the organization. Of course, this level of deployment requires considerable resources for establishing and maintaining employees whose sole duties are to support Six Sigma within the organization. And, frankly, there are very few mid to small-sized that wish to sustain this level of investment, at least initially, until they see some business results. But that does not, by any means, prevent these organizations from taking Six Sigma and shaping them to their individual needs and environments..

The key to successful implementation on a smaller scale is to “buy in” to the process with the same level of commitment shown by larger organizations, but with an eye toward cost-effective project identification and selection, delivery of training, project support and *Return on Investment*.

Many mid to small-sized organizations desiring to implement a Six Sigma deployment may have resource constraints and are looking for a “limited option” rather than a “full deployment”. Typically these organizations will look to some local external resources either at a university or a small consulting partnership (two to three person firm) to provide these services. They are hoping to obtain the fundamentals of statistical process control techniques, or the basics of Six Sigma and then hoping for the best. Or, they may turn to on-line training with the belief that the academic information that can be obtained on a self-study CD will provide sufficient background for practical applications. This level of dedication is destined to fail, and will ultimately prove to be a waste of time and money.

## A Scalable Strategy

While Six Sigma training is scalable, it is not a process that allows for short cuts. You can’t cram four months of training into a two-day seminar and expect to obtain any meaningful results. That’s not fair to Six Sigma, it’s not fair to your employees, and it is ultimately unfair to your customers and other stakeholders.

A proper Six Sigma deployment must be based on structured classroom training conducted by certified instructors using up-to-date materials relevant to your industry or market. The teaching portions must incorporate action learning – based on real business projects that are within the immediate control of the participants – that links classroom work directly to their jobs.

For small to mid-sized companies, this training can be conducted cost-effectively and with great efficiency of time by enrolling Black Belt and Green Belt candidates in classroom activities shared by other companies. In a given city, for example, several companies might each commit two to four workers to a Six Sigma deployment. That combined pool of candidates can jointly attend classroom training to obtain the fundamentals, then work individually with certified Master Black Belts on their company’s initiatives.

Lasting and meaningful change within an organization also requires an ongoing commitment by executive leadership to support the program and let it take its natural course. In virtually every instance where Six Sigma processes are followed to the letter and executive commitment remains strong throughout, the savings gained from the first set of Black Belt projects has more than paid for the cost of training.

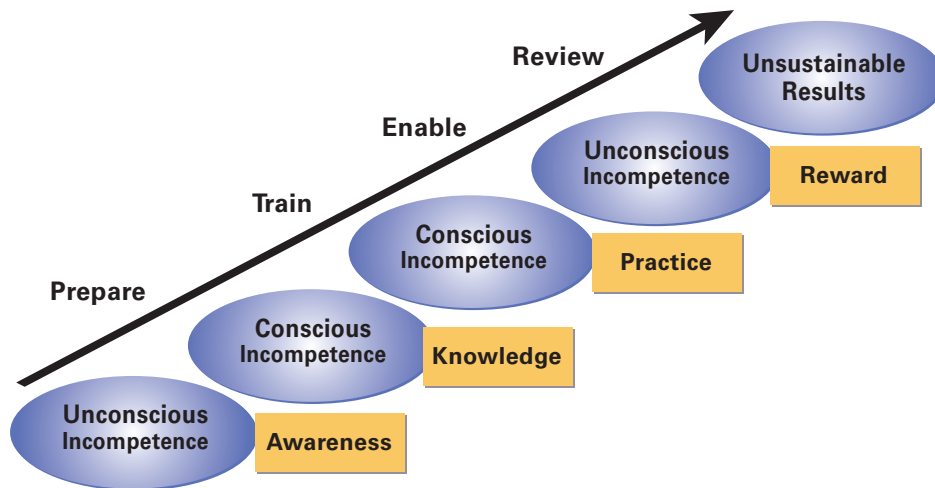
An important practical consideration when introducing Six Sigma into a smaller scale environment is the preparation and participation of the organization’s Finance and Human Resource departments. This level of process management is new territory for many small companies, and it is crucial that a business’ infrastructure is prepared to track, support and reward activities related to the initiative. Any Six Sigma training effort must place considerable effort towards integrating Finance and HR into the process.

### Conclusion

Effectively deploying Six Sigma within a small business will result in breakthrough levels of performance. It is an enterprise-wide strategy that prepares employees to identify, measure, analyze, improve and control the processes that feed production. Six Sigma initiatives will drive irrefutable financial results; but only when the process is followed rigorously and allowed to work.

Organizations, large and small, go through common levels of awareness in their quest for performance improvement (Figure 4). From a total lack of understanding as to their situation to a finely tuned, high-performance organization that can turn on a dime, every business must follow the same path of learning, adapting and sustaining new levels of productivity. With the proper guidance and support, every business organization can utilize Six Sigma to achieve and exceed their goals.

Figure 4



### Six Sigma Qualtec

Six Sigma Qualtec – one of the original firms that started the Six Sigma movement in the late 1980s – has garnered considerable experience and wisdom working with more than 70 corporations worldwide. This knowledge base has led SSQ to develop a Six Sigma program scaled to the needs of smaller businesses without diluting its power to effect significant organizational change and improved productivity.

Classroom training conducted by seasoned Certified Master Black Belts, combined with ongoing support and mentoring roles form the basis for SSQ’s unique approach to meet the needs of smaller, lean organizations operating with an eye towards cost effective, no-nonsense training delivery that provides maximum return on investment.



## Your Strategic Partner

Six Sigma Qualtec is a premier provider of process management and performance improvement consulting, training, and technology solutions that drive breakthrough growth, productivity and value for our clients.

We are unique in our ability to customize the integration of management disciplines to meet the industry-specific requirements of global leaders in financial services, natural resources, manufacturing, process and service industries.

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