

What is Six Sigma?

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One of the most dynamic processes in the field of quality control over the last thirty years has been Six Sigma as pioneered by Motorola. Six Sigma is a quality control standard in which the goal is to reduce variability in every business practice within an organization.

The Six Sigma quality control standard was originated by the Motorola Company in the 1980s and was designed to help eliminate the rate of defects perceived to be caused by manufacturing variation. An organization that achieves Six Sigma is required to have, at the most, 3.4 defects for every one million customer requirements.

To illustrate how strict the tolerance for errors are in Six Sigma, consider the following. Many would consider having 90% quality to be pretty good. Certainly, many more would consider 99% quality to be excellent. But, how about 99.73% quality? Would this level of quality be acceptable or even above the expectations of the pickiest consumer? If the pharmaceutical, healthcare, and public sanitation industries met a 99.73% quality standard the following statistics may provide us with an accurate illustration. There would be at least 54,000 drug prescriptions filled improperly in the pharmaceutical industry annually. The healthcare industry would be responsible for dropping over 40,500 newborn babies every year. Additionally, there would be a period of two hours every month in which the public sanitation industries would allow the water quality to become unsafe.

Now, if Six Sigma were to be achieved in each of these industries, quality would be improved to the following level. There would be only one improperly filled drug prescription every twenty-five years in the pharmaceutical industry. Only three babies would be dropped every one hundred years in the healthcare industry. Finally, the public would only have to endure one second of unsafe drinking water every sixteen years.

Six Sigma strives to remove variability in all facets of an organization and challenges each member of the company to become committed to this culture. Six Sigma is much more than a way of removing flaws in the manufacturing process and the product. For Six Sigma companies, process improvement needs to be included in every business practice, including those jobs that are considered indirect labor or non-revenue producing. Six Sigma has been applied to unconventional business practices such as the percentage of properly filed paperwork, customer complaints, and even effectiveness of solvents used in restrooms.

Implementation of Six Sigma: The implementation of Six Sigma follows a strict protocol. First, projects are selected starting with those that are thought to have the highest organizational priority. For many years the process of Six Sigma implementation followed a five-step process referred to as DMAIC. However, there is a new eight-step Six Sigma Breakthrough Process that many organizations are using to rework quality issues. The eight steps include: Recognize, Define, Measure, Analyze, Improve, Control, Standardize, and Integrate.

Member evolution: The Six Sigma training process is very organized and structured. This structure serves two purposes. Corporate decision makers can see progression at each level of implementation. Most importantly, the Six Sigma training process incorporates a climate of employee involvement. This employee involvement is very important as it ensures that the transition to Six Sigma has the best possible chance to succeed. When employees are involved, transitional management is much easier. As employees go through Six Sigma training they earn belts, similar to those earned in the martial arts. These belts signify the employee's Six Sigma skill and knowledge.

- **Yellow belt:** The yellow belt is the starter level of Six Sigma. When an employee goes through yellow belt training they are taught the essentials of Six Sigma and discover how the process works. Yellow belt training normally takes one week to complete. Upon completion of yellow belt training, the employee can serve as an organizational leader in simple projects or support green and black belts in implementation of more complex projects.
- **Green belt:** Green belt training can normally be completed during a two-week seminar. Upon completion of this training the employee can lead Six Sigma projects with estimated returns greater than \$25,000 annually. In this training program, potential green belts learn about various methods of measuring data, including many quantitative models that can be used to diagnose organizational inefficiencies. Most Six Sigma projects are led by green belts. A Six Sigma organization should have one green belt for every \$100,000 in annual revenue.
- **Black belt:** Whereas green belts fully understand the concepts of data collection and interpretation, black belts have an equal or greater knowledge of these statistical tools in addition to the knowledge of how to lead many groups of Six Sigma projects simultaneously. A Six Sigma organization should have one black belt for every \$1,000,000 in annual revenue. Black belts serve as leaders and points of reference for green and yellow belts. Green belts will need to report to black belts regarding the status of their Six Sigma projects.
- **Six Sigma champions:** The highest level of Six Sigma training is the Six Sigma champion. These employees are those who have proven to be effective as black belts. The champion training differs from the black belt training in that the employee focuses on organizational leadership and the strategic decision making process. A Six Sigma champion is often times connected with a member of the organization's senior management in order to identify and lead projects of vital importance. Six Sigma champions are also referred to as master black belts.

Six Sigma Challenges: Certainly, the process of implementing Six Sigma is a challenge for any organization. The implementation process introduces a huge time of adjustment which is one of the primary challenges of Six Sigma. Many of the Six Sigma organizational implementations that don't stick have to do with these companies not being fully committed to the process.

In addition, many organizations are faced with challenges regarding implementation of Six Sigma because they fail to assign metrics to all business functions. One of the necessities of Six Sigma is to quantify all business functions in order to improve on them. Even when it comes to support functions such as paperwork, quality of this function must be analyzed quantitatively. Stating that peripheral business functions are good or bad is not precise enough. It is essential to determine how many errors are made per million attempts.

Six Sigma Benefits: The division of Motorola that oversees their Six Sigma services is known as Motorola University. Motorola University claims that the return on investment for properly implemented Six Sigma projects ranges between 10:1 and 50:1. Few organizations would not be interested in learning more about a process that can offer that level of return on investment.

The popular literature is filled with the benefits that Six Sigma can provide organizations in which its principles are incorporated. Many of these benefits can be associated with how an organization must be aligned towards continuous improvement in everything it does.

- **Teambuilding:** Teambuilding is an essential element of Six Sigma. Many organizations wish that their workforce would communicate effectively across functional silos. However, they have no idea how to initiate this communication. The Six Sigma process requires just this kind of cross-functional communication in order to succeed.
- **Constant improvement:** One of the most basic tenets of Six Sigma is constant improvement. Six Sigma supporters state that while 3.4 defects per million attempts may be unattainable for the vast majority of companies; this goal serves as a constant reminder that there is no such thing as good enough. The only constant is the need for improvement.
- **Mandated training:** Many organizations never seem to have time for training. Either these organizations do not properly prioritize training or they see it as an unnecessary expenditure of capital with no obvious correlation to revenue. The Six Sigma Quality Control Program mandates training in all aspects of organizational processes. Any business process that incorporates Six Sigma must be refined and this refining process requires training.
- **Return on investment:** One of the greatest advantages that the Six Sigma Quality Control Program offers organizations is the reported return on investment. According to its 1997 annual report, AlliedSignal reported a \$1.5 billion savings due to Six Sigma. GE chairman Jack Welch has been credited with claiming savings in the billions of dollars that directly correlated to Six Sigma implementation. Yet, in order to achieve these levels of return on investment, organizations must be willing to commit significant time, energy, and resources to the process. There is no such thing as partially committing to Six Sigma as it is an all or nothing proposition.
- **Increased aptitude for organizational change:** Finally, Six Sigma can introduce an increased aptitude for change. Six Sigma is devoted to constant improvement and continual change in all business processes. All members of the organization are continually asked for examples of processes that can be improved and recommendations of solutions to these inefficiencies. This constant solicitation of input creates a corporate culture in which change is sought after and implemented with relative ease.



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