White paper

Contents

Six Sigma

Six Sigma is a highly disciplined process that helps us focus on developing and delivering near-perfect products and services.

What is six sigma?

Six Sigma is a highly disciplined process that helps us focus on developing and delivering near-perfect products and services. The word “Sigma” is a statistical term that measures how far a given process deviates from perfection. The central idea behind Six Sigma is that if you can measure how many “defects” you have in a process, you can systematically figure out how to eliminate them and get as close to “zero defects” as possible. To achieve Six Sigma quality , a process must produce no more than 3.4 defects per million opportunities.

Defects and Sigma Levels:

One virtue of Six Sigma is that it translates the messiness of variation into a clear black- or – white measure of success: either a product or service meet customer requirements or it doesn’t. Anything that doesn’t meet customer requirements is called a defect.

If you can define and measure customer requirements, you can calculate both the number of defects in your process and outputs as well as the process yield, the percentage of good products and services produced (meaning they are without defects).

Another approach to determining a sigma level is to calculate how many defects occur compared to the number of opportunities there are in the product or service for things to go wrong. The outcome of this calculation is called Defects Per Million Opportunities (DPMO).

Six Ingredients of Six Sigma:

The Six Sigma way introduced six critical ingredients needed to achieve Six Sigma capability within an organization:

- Genuine focus on the customer.
- Data- and fact-driven management.
- Process focus, management and improvement.
- Proactive management.Boundaryless collaboration.
- Drive for perfection, tolerate failure.

Three ways to Six Sigma Strategy:

Customer knowledge and effective measures fuel a Six Sigma engine with three basic parts, Process Improvement, Process Design and Process Management.

Process Improvement:

The purpose of process improvement is to eliminate the root causes of performance deficiencies in processes that already exit in the organization.

To eliminate these deficiencies a five-step approach, DMAIC is used.

- Define – Select customer-focussed problem, document business impact and determine project deliverables.
- Measure – Locate the current problem sources and measure the defects and process operation.
- Analyze – Analyze the root cause of the defects and the sources of variation.
- Improve – Root causes are removed by means of designing and implementing changes to the offending process.
- Control – Control the process to make sure that the defects don't recur.

Process Design/ Redesign:

Sometimes, new processes will need to be designed or existing process will need to be re-designed. Teams use Six Sigma principles to create revolutionary new processes, goods and services in process design. A five step approach, DMADV is used to design/ re-design a process.

- Define – Identify the goals for the new processes based on customer requirements.
- Match – Measure and match the performance requirements to customer requirements.
- Analysis – Analyze these performance requirements and access process/product/service design.
- Design/Implement – Procedure a detailed design and implement the new process.
- Verify – Verify the results and maintain the performance.

Process Management:

Process Management is often the most challenging and time-consuming part of Six Sigma, because it involves changes in culture and management throughout the organization. Process Management tends to evolve as a business expands its Six Sigma effort and deepens its knowledge of its processes, people, and customers. In general, Process Management includes of:

- Define – Defining processes, key customer requirements and process "owners".
- Measure – Measuring performance to customer requirements and key process indicators.
- Analyze – Analyzing data to enhance measures and refine the process management mechanisms.
- Control – Controlling performance through ongoing monitoring of inputs/operations/outputs and responding quickly to problems and process variations.

Organizing For Six Sigma:

There are different roles for people in the evolving Six Sigma organization. Teams alone cannot change corporate structures. They must be part of an infrastructure designed to assist in the re-design of the organization. The three special roles are discussed here.

Master Black Belts:

It is the Master Black Belts who often serve as Six Sigma Coaches, while Black Belts serve as Team Leaders. The coaches usually receive in-depth training on statistical tools and process improvement and often provides expert advice in these areas to a number of Process Owners and Six Sigma Improvement Teams.

- Serve as change-agent consultants to the Leadership Council and other managers.
- Helping to resolve team conflicts.
- Helping teams to promote and celebrate their successes.
- Gathering and analyzing data about team activities.
- Establishing and sticking to a firm schedule for projects.

Black Belts:

The team "Black Belt" actually means someone who leads a Six Sigma improvement team. The Black Belt accepts the primary responsibility for the routine work and results of a six sigma project. Their duties are similar to those of the coach, but specific to one team only. They usually get several weeks of training in process analysis and team meeting skills. Their responsibilities include:

- Helping the Champion understand how six sigma techniques apply to everyday operations.
- Working with team members to develop/update the implementation plan.
- Identifying and finding resources and data for the team.
- Maintaining the team's project schedule and keeping the team moving towards the project completion on time.

  Documenting the final project results.

Green Belts:

Green Belts are usually employees who have received enough Six Sigma training to participate in a team, in some companies, to work individually on a small-scale project related to their own job. They bring the brain and muscle for collection and analysis of data needed to improve the process.

- Ask questions and participate actively in the team's work.
- Carry out instructions for data collection and analysis.
- Listen actively to others, and practice good meeting management skills.
- Review the efforts of the team from time to time to improve the meeting process.
- Willingness to work cooperatively with other members.

Summary:

Six Sigma, as a target, was created to stimulate dramatic improvements. Any organization that can run its processes to a six-sigma level, theoretically producing only about 3.4 defects per million opportunities, is a formidable competitor. In fact, just making progress leads to lower costs, better reliability, a better experience for the customers. Thus, Six Sigma is the structured application of tools and techniques applied on project basis to achieve sustained strategic results.

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