

# What is DMAIC in Six Sigma?



Businesses across the globe interested in achieving optimal process efficiency and targeted improvements have integrated the management techniques inherent to the Six Sigma methodology to achieve a powerful positive impact on project management, problem solving, and their bottom lines.

One of the most important concepts at the core of Six Sigma is known as DMAIC: Define, Measure, Analyze, Improve, and Control.

The steps outlined in this concept are designed to maximize process improvements while minimizing the chance of costly errors and deviations.

Understanding the capabilities, and limitations, of an effective DMAIC implementation is the first step to achieving lasting process improvements.

## **DMAIC Six Sigma: Narrowing the Path to Success**

Achieving what the Japanese call *kaizen*, or continuous improvement, is the foundation of Six Sigma.

The DMAIC process is a multi-phase methodology designed to foster *kaizen* by

creating a funnel that narrows the field of *root causes*—the driving forces behind persistent and costly errors and inefficiencies—to the bare minimum.

By reducing the number of things that *could* go wrong, create roadblocks, or generate unnecessary expense, the DMAIC funnel effectively reduces the number of those that *do*.

DMAIC (often pronounced as an acronym, i.e. “Dah-may-ick”) is a data-driven expansion of the core Six Sigma philosophy, which states “if you control the inputs, you’ll control the outputs.” This concept is sometimes expressed as a formula, specifically:

$$y=f(x)$$

Where **x** is *input*, **y** is *output*, and **f** is *function*, or the impact the inputs have on the output.

So if, for instance, you were measuring the ability of a customer to receive timely assistance with a question submitted online, you could measure inputs such as number of available representatives, average wait time for a response, time required to research questions in various categories, etc. and then use the data collected to improve the impact of each input to achieve your desired output.

Each phase in the process is designed to attenuate the number of root causes while simultaneously improving the specific performance of each process used.

In this way, Six Sigma melds with the *Lean* philosophy, creating what is often known as *Lean Six Sigma*.

This two-pronged approach brings together the preventative approach of Six Sigma with the “trim the fat” ameliorative approach of Lean.

Together, they reduce potential roadblocks to success while boosting the efficiency and efficacy of existing processes.

Typically, Six Sigma projects are:

- Well-defined and focused on directly improving profitability, productivity, or both.
- Built on scientific data analysis and project management.

- Led by specially trained and certified belt holders (Six Sigma Black Belts, Six Sigma Yellow Belts, Six Sigma Green Belts, etc.) with various roles and responsibilities roughly analogous to the training levels found in many martial arts.
- Built around the DMAIC methodology to optimize problem-solving through both reduction of potential problems and process improvement.

The DMAIC process is not the only approved methodology used on Six Sigma projects, but it is one of the most widespread and well-known in current use.

*In applying scientific and statistical analysis to problems and processes using the Six Sigma formula  $y=f(x)$ , achieving the desired output begins with tightly defining and refining the boundaries and processes within a given Six Sigma project. DMAIC is the funnel through which your project will travel on its journey to optimization.*

## **Moving Through the DMAIC Funnel**

The real power of the Six Sigma process within project management lies in a scientific approach to root cause analysis (RCA), data analysis, and problem solving.

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Let's take a closer look at each of the phases in the DMAIC process:

### **The Define Phase**

During this phase of the process, the project team will establish the parameters for the project in detail, including the critical to quality (CTQ) issues and the root causes and business processes to be refined.

CTQ issues are those issues being measured to ensure optimal quality control and process improvement, and in direct support of project goals.

The Pareto Principle (also known as the 80/20 rule) provides guidance in focusing project goals on the most critical root causes and CTQ issues to ensure maximum improvement.

Items to be defined include:

- Customer (internal or external) identity.
- Customer requirements for goods and services
- Customer expectations with regard to the quality, quantity, and other aspects of the required goods and services.
- Project start and stop points.
- A map containing all processes targeted for improvement.

## **The Measure Phase**

During this phase, the performance of the core processes is carefully recorded and evaluated.

The team:

- Creates a data collection plan for each business process to be evaluated.
- Sources data from a diverse, but focused, set of sources to evaluate potential roadblocks, failures, and performance issues.
- Survey customers and compare responses to performance data to further clarify areas that need improvement.

## **The Analyze Phase**

This phase is devoted to data analysis and creating a process map to narrow root causes and target improvement opportunities.

In this stage, the team:

- Compares existing performance of current processes to target performance. Pareto charts may be used to provide granulation for the specific impact of each process being measured.
- Employs Failure Modes and Effects Analysis (FMEA) to prioritize risks

and root causes.

- Clarifies the root causes of variations, errors, and inefficiencies in process performance.

## The Improve Phase

In this phase, the team works to develop creative and lasting solutions to both solve existing issues and prevent future ones.

The team members:

- Use technology (such as cloud-based, centralized procurement software with artificial intelligence) to develop workflow improvements, process updates, and internal controls to reduce risk and waste while increasing efficiency, morale, and productivity.
- Create a detailed implementation plan for the solutions developed to improve process control.

## The Control Phase

The final phase of the DMAIC is designed to maintain the new improvements and support future initiatives in continuous improvement.

The team works to:

- Avoid “backsliding” or reversion to old, sub-optimal processes and workflows.
- Create a comprehensive monitoring and control plan to ensure continued compliance.
- Integrate the developed improvements into the workflows and business processes already in place, including the necessary updates to documentation, training, software, and hardware.

With Six Sigma, there’s *always* room for improvement.

Consequently, the DMAIC process is cyclical. Today’s successful projects and processes may yet benefit from further refinements discovered in another journey through the funnel.

# DMAIC Makes Growth Happen

You don't have to be a Six Sigma Master Black Belt to benefit from the productivity-boosting power of DMAIC.

By understanding how to integrate Six Sigma DMAIC into your current processes, you can begin to make *every* project a source of savings, value generation, and improved process capability.

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