

Six Sigma: Entering the Dojo

Quick Reference Guide

DMAIC and DMADV?

Organizations use six Sigma initiatives to provide a structured approach to improving and developing process excellence. Several tools to accomplish this will be discussed in subsequent sessions.

The Six Sigma tools are used within a specific organizational framework. The two most used frameworks are the DMAIC (Define, Measure, Analyze, Improve, Control) and DMADV (Define, Measure, Analyze, Design, Verify) approaches to problem-solving. This data-driven process comes to improving processes are also used in Lean and other quality initiatives.

The following table shows the characteristics of each approach.

| DMAIC | DMADV |
|---|---|
| Used when an existing process or product does not meet customer expectations or is not performing adequately. | Used to develop a new process or product or, when after using DMAIC, the process still does not meet the customer's expectation or Six Sigma. |
| Define the problem in the current process, improve project goals, and internal and external customer expectations/ requirements. | Define the new process project goals and internal and external customer deliverables. |
| Measure the current performance of the process. | Determine and Measure customer requirements and specifications. |
| Analyze the process data to determine the root causes of the poor performance of the process. | Analyze the process requirements and alternatives to meet customer requirements and specifications. |
| Improve the performance of the process by eliminating the root causes of the problems. | Design the new process to meet the customer requirements and specifications. |
| Control the improved process. | Verify the design performance and ability to meet customer requirements and specifications. |

Flowcharts

Flowcharts. A flowchart is a way to represent a process visually. It can also identify critical points in a process - where mistakes, bottlenecks or other problem may arise.

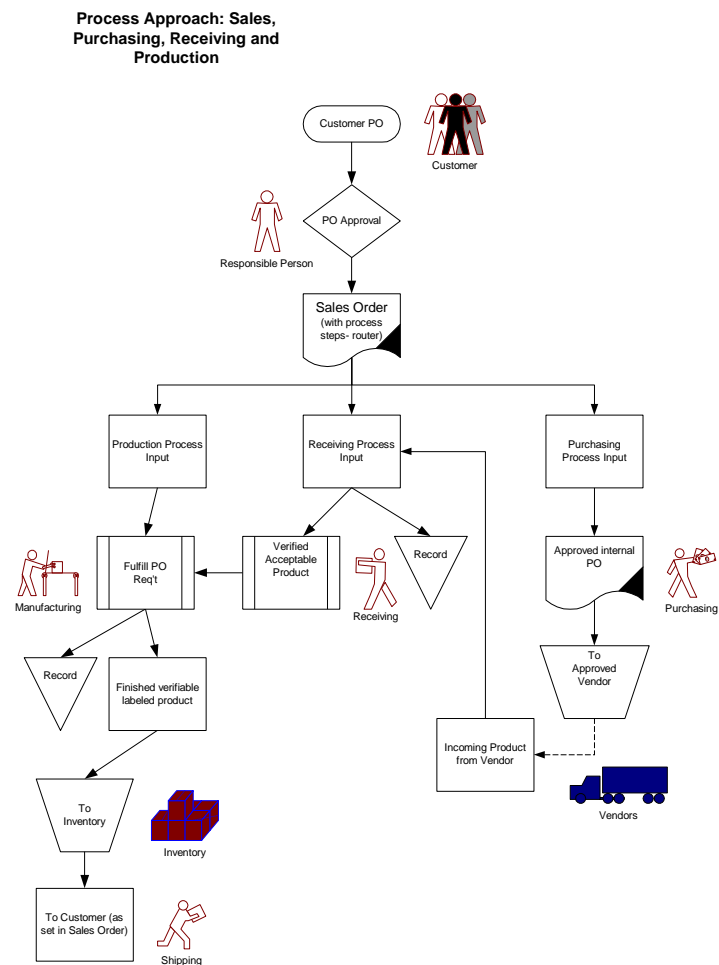
Each shape has a particular meaning. The basic shapes used are:

- Diamond – decision point in the process
- Rectangle – a procedure
- Lines and arrows – the flow of the steps in the process

There are a few steps to creating a simple flowchart:

- List the steps in a process
- Determine if the step is a procedure or decision
- Draw accordingly
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The following is an example of what you might see in the industry:



How to carry out a Six Sigma Continuous Improvement project

1. Define the scope.

The Project Team should review the scope of the project. The team leader should talk to the customer and end-user to determine what they think the problems are and define their expectations.

The project's scope includes the problem statement, a definition of the boundaries, the magnitude of improvement goals, a target date for completion, and the resources available.

One of the fundamental approaches of Continuous Improvement is to look at the process from the customer's point of view. The starting point should be to find out what the customer and the end-user wants.

2. Measure the current performance of the process.

The next step is to understand how the process presently works. Before the Project Team can attempt to improve the process, it must know how it works now and what it is supposed to do.

An excellent way to understand the process is to describe it. One benefit of explaining the process is that it sometimes leads to discovering apparent problems and solutions that can be fixed quickly. The team should ask and answer critical questions:

- What does the process do?
- What are the stages of the process?
- What are the starting and finishing points of the process?
- What are the inputs and outputs from the process?
- Who are the suppliers and the customers of the process?
- Who uses the product and who pays for it?
- Are there noticeable problems with the process?

3. Analyze the process data to determine the root causes of the poor performance of the process.

Based on the project goals, the team should review what information is needed to analyze the problem.

For each goal, the team should determine what information is needed to understand how well the process works. They need to know what information is available and what is not available and how to collect the information that is not presently available.

As discussed previously, there are a variety of tools that can be used; these include:

- Affinity Diagrams
- Benchmarking
- Control Charts
- Brainstorming
- Cause-and-Effect Diagrams
- Pareto Charts

4. Improve the performance of the process by eliminating the root causes of the problems.

The ideas for solving the problem should be evaluated against criteria to determine the best solution. The team should define an ideal solution's characteristics and identify the requirements that must be satisfied and the desirable criteria but not necessary.

Constraints to a proposed solution should be identified. A constraint is a factor that limits the selection of a particular solution. These constraints may take the form of budget limits, rules or practices that may make a solution difficult to carry out.

Each possible solution should be evaluated against the criteria for selection. The team should seek to develop a solution that comes closest to solving the root causes, is the easiest to implement, satisfies the criteria for selection, and does not impact the constraints.

There may be occasions where the team identifies constraints that in fact, are not real constraints. The team may find some flexibility if it pushes hard enough to have limitations removed.

When the team has selected the best alternative, it should obtain feedback from those most affected by the changes.

Depending upon the nature of the changes, it may be possible to implement them right away. Alternatively, it may be necessary to present the Steering Team's recommendations to obtain approval before implementing it.

The team should use the Plan, Do, Check, Act sequence to implement the proposed changes.

Define what changes are to be made. Generate a list of activities that need to be done to accomplish the objective and then figure out the sequence of steps required to implement the changes.

A schedule of activities should be prepared and milestones defined so that progress can be monitored. Responsibilities for each of the action steps should be defined.

It is sometimes better to implement the changes on a pilot basis than make a wholesale change across the board.

5. Control the improved process.

Monitor the changes' effectiveness and compare the results of the changes with the study's original goals. Continue to monitor to ensure the process stays in compliance.