



UNIT-4

Continuous Improvement

Learning Outcomes

By the end of this unit the learner will be able to:

- ✓ Describe incremental and breakthrough improvements and understand the methodologies of continuous improvement projects.
- ✓ Describe the various quality management tools.

Unit 4

Continuous Improvement

In this session, you will learn how to carry out a Six Sigma continuous improvement project. Continuous improvement is a fairly simple concept to grasp — whatever you do in your business, implement a process to ensure it is done better the next time.

There are two fundamental ways that this improvement can take place:

- **Incremental Improvement** - This is the slow and steady turtle-paced improvement.

This is the day-to-day 'tweaking' of the processes and procedures in the operations.

- **Breakthrough Improvement** - This is the fast-paced rabbit-style improvement.

Breakthrough projects usually involve rather radical changes to the existing processes at the company. The term reorganization or re-engineering are sometimes heard in relation to breakthrough improvement. In breakthrough improvement you are generally designing a new way to do things.

How to carry out a Six Sigma Continuous Improvement project

In the second module we introduced the Six Sigma project approach that is used when an existing process or product does not meet customer expectations or is not performing adequately - DMAIC. We also realize DMAIC stands for:

- Define the problem in the current process, the improvement project goals, and internal and external customer expectations/requirements.
- Measure the current performance of the process.
- Analyze the process data to determine root causes of the poor performance of the process.
- Improve the performance of the process by eliminating the root causes of the problems.
- Control the improved process.

Let's look at it in more detail.

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 find out what they think the problems are and define their expectations. The scope of the project includes the statement of the problem, 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 want.

The end user may not be the customer. They may be downstream from the process or they may be external. Whoever the customer or end user is, the goal should be to find out their expectations and meet them.

Firstly, the team should talk to the customer and find out how they use the product or service, what problems they have with it, and how it can be enhanced.

The information obtained from these interviews should be analyzed to determine which aspects of the product or service should be improved and the extent to which the product or service meets the needs of the customer.

Based on this analysis the team should define the project goals. These goals will likely differ from the original goals set by the Steering Team.

It is the job of the Team Leader to go back to the Steering Team and negotiate any changes. The new set of goals are likely to be more realistic and useful than the original goals set by the Steering Team

The team should develop a very clear understanding of what is expected from the project. The goals should be quantified and used as a benchmark to measure the success.

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 understand how it works now and what it is supposed to do. A good way to understand the process is to describe it. One benefit of describing the process is that it sometimes leads to the discovery of obvious problems and solutions that can be fixed quickly. The team should ask and answer key 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 obvious problems with the process?

3. Analyze the process data to determine 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 is working. 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:

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

Use brainstorming, cause-and-effect diagrams or affinity diagrams to develop a list of possible causes. Begin by defining the problem, then generate ideas as to the cause. To get at the root cause you need to ask the question 'what is the cause of the cause?'. For instance if some manufactured parts are defective find out why. Maybe it is due to a supplier problem. Ask why again and keep asking why until the team cannot think of another question to ask.

When the team has figured out what it thinks the root causes are it should verify the conclusions with data. The team should think about why it is collecting data and what data it needs to verify the conclusions. It is easy to draw the wrong conclusions from erroneous data. Use charts and graphs to analyze the data and have the conclusions checked by others who are knowledgeable in the process.

If there are obvious root causes that can be fixed easily then take action to fix them straight away.

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 the characteristics of an ideal solution and identify the criteria that must be satisfied and the criteria that are desirable but not absolutely 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 which comes closest to solving the root causes, is the easiest to implement, satisfies the criteria for selection, and does not impact on 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 constraints removed.

When the team has selected the best alternative it should obtain feedback from those people who are 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 recommendations to the Steering Team to obtain approval before they can be implemented.

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

Define exactly 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 that are 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.

Be sure that all those people who are affected by the changes are properly informed and briefed on the reasons for the changes and that they understand how the changes will take place.

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

5. Control the improved process.

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

Carry out a continuous improvement project following the DMAIC steps:

- Review a SeaStar procedure provided in the handouts. The customer for this project will be the course instructor. Any customer satisfaction questions should be directed to them.

You will:

- Define the problem in the current process, the improvement project goals, and internal and external customer expectations/requirements.
- Measure the current performance of the process.
- Analyze the process data to determine root causes of the poor performance of the process.

Also, give suggestions to improve the performance of the process and measures that could be used to control the improved process.

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This image shows a full page of white paper with horizontal black ruling lines. The lines are evenly spaced and run across the width of the page. There are two shaded gray rectangular areas: one at the top left corner and another further down on the left side. These appear to be artifacts from a scanning process or part of a template design. The rest of the page is empty except for the lines.

Further Reading:

- ✓ *The Power of Habit: Why We Do What We Do in Life and Business*(07/2014), Charles Duhigg

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