



**CONTINUOUS  
IMPROVEMENT**

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# FUNDAMENTAL CONCEPTS

## QUALITY TRILOGY

Quality Management involves three managerial processes:

- Quality Planning
- Quality Control
- Quality Improvement.

These processes are similar to those for Financial Management:

- Financial Planning
- Financial Control
- Financial Improvement.

The difference in the two is that focus of Financial Management is vertical silo functions. On the other hand, the focus of Quality Management is horizontal cross-functional processes that deliver outputs to external and internal customers.

This is contrary to the belief that Quality is an Operations side subject only. Classical Quality Management envisions it to encompass all departments. Teams that work on cross-functional projects are the best example of Quality Management in action.

## CUSTOMER FOCUS

In Quality Planning, we set the standard based on the Voice of Customers (VOC). The output of Quality Planning is a capable process.

In Quality Control we maintain the standard based on process design (and VOC). Quality Control entails measurement of process performance, comparison with the desired standard, and reaction to differences. The spike like differences / fires are referred to as sporadic problems. The remedy is to put the fire out. Sporadic problems generate customer complaints.

Next, in order to be competitive, we proactively challenge the standard based on VOC. This is referred to as Quality Improvement. Quality Improvement entails identification of chronic problems that are deep rooted (without alarms) in the manufacturing, service delivery and business processes of an organization. Processes are a series of activities and tasks that deliver outputs to external and internal customers. The alarms are triggered by expressing the chronic problems in the language of upper management – money!

The VOC, in terms of the Quality Trilogy, is in regards to product / service features; as well as intolerance of deficiencies. The former is addressed by Quality Planning. The latter by Quality Improvement.

## **SO HOW IS QUALITY IMPROVEMENT UNDERTAKEN?**

Solving chronic problems for Quality Improvement is basically a journey from Symptom to Cause to Remedy. The diagnostic journey from symptom to cause requires application of Quality Improvement Tools in multiple combinations. The remedial journey, on the other hand, can benefit from using some Creativity Tools.

The popular structured methodologies for Quality Improvement are:

Juran on Quality Improvement

- Six Sigma
- Lean Six Sigma
- Theory of Constraints
- Kaizen

## **RESULTS**

The results from Quality Improvement are tangible and intangible.

The tangible results are:

- Reduction in customer dissatisfaction
- Reduction in waste embedded in processes
- Reduction in inventory – incoming, WIP, finished goods
- Reduction in cycle time of processes
- Reduction in warranty / guarantee costs
- Overall, reduction in Cost Of Poor Quality (COPQ).

The intangible results are:

- Improved cross-functional communication
- Improved motivation of the workforce
- Dilution of resistance to change

In summary, customers require goods and services Faster, Better, Cheaper. This demands Continuous Quality Improvement, in manufacturing, services, healthcare, and education.

In our experience, only 25% chronic problems have their root causes in manufacturing and service delivery processes. Approximately 50% chronic problems have their root causes in product design / development, supplier processes, and errors in understanding VOC. The balance 25% has their root causes in logistics and distribution.

## SPORADIC & CHRONIC PROBLEMS

A problem is a specific and visible performance deficiency in any manufacturing, service or business process; and the corresponding output of product, service or document.

In world-class quality management no process is exempt; nor is any output exempt. Problems come in two avatars: sporadic and chronic.

A sporadic (occasional) problem is a sudden negative deviation from the standard or status quo. The remedy lies in restoring the standard.

A chronic problem is a long standing negative situation which requires remedy through challenging and changing the standard.

Chronic problems are not dramatic. Sporadic problems are dramatic.

### ***KEY INSIGHTS***

- *Solving chronic problems requires a proactive mindset. Solving sporadic problems requires a reactive mindset. Both are important.*
- *The danger is that fire fighting on sporadic problems becomes an URGENT & IMPORTANT priority over fire prevention efforts on chronic problems that are considered NOT-URGENT & IMPORTANT.*

# QUALITY IMPROVEMENT TOOLS

## FLOW DIAGRAMS

A flow diagram is a graphic representation of the sequence of steps that we perform to produce some output. The output may be a physical product, a service, information, or a combination of the three.

## BRAINSTORMING

Brainstorming is a group technique for generating new and useful ideas. It uses a few simple rules for discussion that increase the chances for originality and innovation.

## CAUSE-EFFECT DIAGRAMS

Basic to quality improvement is the need to identify the root causes of a problem. The cause-effect diagram is an effective way to organize and display the various theories about what those root causes might be.

## DATA COLLECTION

Data and facts are fundamental to every quality improvement effort. Without the facts, our problem-solving efforts are reduced to a “guessing game” with relatively low odds for success. In this chapter, we describe how to gather good data using simple data-collection methods.

## GRAPHS AND CHARTS

Graphs and charts are pictorial representations of quantitative data. They can summarize large amounts of information in a small area and communicate complex situations concisely and clearly.

## STRATIFICATION

Stratification is the separation of data into categories. It’s most frequent use is during the diagnostic journey to identify which categories contribute to the problem being solved.

## PARETO ANALYSIS

Pareto analysis is a ranked comparison of factors related to a quality problem. It helps a quality improvement project team to identify and focus on the vital few factors.

## **HISTOGRAMS**

A histogram is a graphic summary of variation in a set of data. The pictorial nature of the histogram enables us to see patterns that are difficult to see in a simple table of numbers.

## **SCATTER DIAGRAM**

A scatter diagram is a graphic presentation of the relationship between two variables. In quality improvement, scatter diagrams are usually used to explore cause-effect relationships in the diagnostic journey.

## **BOX PLOTS**

Box plots, like histograms; provide a graphic summary of the pattern of variation in a set of data. The box plot is especially useful when working with small sets of data or when comparing many different distributions.

## QUALITY IMPROVEMENT TOOLS

Flow Diagrams  
Brainstorming  
Cause-Effect Diagram  
Data Collection  
Graphs and Charts  
Stratification  
Pareto Analysis  
Histogram  
Scatter Diagrams  
Box Plots

Flow Diagrams	Brainstorming	Cause-Effect Diagram	Data Collection	Graphs and Charts	Stratification	Pareto Analysis	Histogram	Scatter Diagrams	Box Plots
■	■	■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■	■	■

## STEPS OF PROBLEM SOLVING

- List and prioritize chronic problems
- Identify the project team
- Analyze symptoms
- Formulate hypotheses of causes
- Test hypotheses
- Identify root causes
- Evaluate alternative solutions
- Develop solutions and controls
- Address resistance to change
- Implementation controls
- Check performance
- Monitor control systems

## CREATIVITY TOOLS

Problem reformulation/  
heuristic redefinition<sup>1</sup>  
Purpose hierarchy  
Classic brainstorming  
Brainwriting 6-3-5  
Imaginary brainstorming  
Tilimag  
Word associations  
and analogies  
Morphological box

Problem reformulation/ heuristic redefinition <sup>1</sup>	Purpose hierarchy	Classic brainstorming	Brainwriting 6-3-5	Imaginary brainstorming	Tilimag	Word associations and analogies	Morphological box
■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■

■ Frequent application of tool

■ Circumstantial application of tool