

MGMT 8040 Project Procurement and Quality Management - 12 hours (1.2 CEUs)

COURSE OBJECTIVES

After completing this course, students will know:

- What quality is
- What the processes of project quality management are
- Tools and techniques to achieve quality
- What project procurement management is
- What the processes of project procurement management are

PREREQUISITE None

TEXTS

A Guide to the Project Management Body of Knowledge (PMBOK® Guide), 6th Edition, Project Management Institute, 2017

The Team® Handbook, Third Edition, Oriel, 2003

INSTRUCTOR

Module 2

Module Objectives

The objectives of this module are:

- Understand the process of Control Quality
- Define the strategies for Six Sigma steps 2 through 5

Reading Assignments

PMBOK® Guide, Chapter 8, Section 8.3

The Team Handbook, Chapter 4

Control Quality

The process of Control Quality involves monitoring and recording project results to assess quality performance and recommend changes. Some of the tools and techniques used in this process may include:

- Cause and effect (Ishikawa) diagram – a diagram used to determine root causes of problems
- Control charts – a chart to determine if a process is stable and predictable
- Flowcharting – diagramming a process
- Histogram – a bar chart that can be used to characterize project problems
- Pareto (80/20) chart – a particular type of histogram that shows the distribution of project problems
- Run chart – a chart that shows the pattern of variation in a process
- Scatter diagram – a diagram showing the relationship between two variables
- Statistical sampling – inspecting a random sample to determine quality compliance
- Inspection – inspecting the results of a process to determine compliance with quality standards

Some of the outputs of the Control Quality process may include:

- Quality control measurements
- Verified deliverables
- Completed checklists
- Lessons learned documentation

Six Sigma Step 2 – Measure

The second step in the Six Sigma process is to focus the process improvement effort by gathering information on the current situation. The chart on p. 5-26 of *The Team Handbook* lists some of the strategies that can be used in this step. The primary strategy for this step is:

- Collect meaningful data

1. Collect meaningful data – as described in p. 5-31 through 5-33 of *The Team Handbook*, it is important that data collection goals be set, that operational definitions and procedures be developed, and that a plan for data consistency and stability be established. It is recommended that the data be normalized in order to achieve meaningful comparisons across different organizations.

Six Sigma Step 3 – Analyze

The third step in the Six Sigma process is to identify what are called “root causes” of the problems in the process, and confirm these causes with data. The chart on p. 5-26 of *The Team Handbook* lists some of the strategies that can be used in this step. The primary strategies for this step are:

- Identify root causes of problems
- Design experiments to identify relationships

1. Identify root causes of problems – it is important not to try to fix the symptoms of a process problem, but to identify the underlying cause of the symptoms, sometimes called the “root cause” or “deep cause”. The steps to identify these root causes are described in p. 5-34 through 5-35 of *The Team Handbook*.

One of the tools used in identifying root causes is the cause and effect diagram or Ishikawa diagram. This diagram and how to use it is described in p. 4-26 through 4-27 and B-6 of *The Team Handbook*, as well as p. 293-294 of the *PMBOK® Guide*.

2. Design experiments to identify relationships – p. 4-62 through 4-64 of *The Team Handbook* describes the steps required to design and conduct experiments to determine which variables are most important to the operation of a process.

Six Sigma Step 4 – Improve

The fourth step in the Six Sigma process is to develop and implement solutions that address the root causes of the problems in the process. The chart on p. 5-26 of *The Team Handbook* lists some of the strategies that can be used in this step. The primary strategies for this step are:

- Develop appropriate solutions
- Plan and make changes
- Collect meaningful data

1. Develop appropriate solutions – after describing the goals and needs that the solution must fulfill, alternative solutions and criteria to evaluate these alternative solutions are developed. After conducting this evaluation, the best overall solution is selected. These steps are described in p. 5-36 through 5-38 of *The Team Handbook*, including a method of developing the evaluation criteria (p. 5-38).

2. Plan and make changes – The PDCA (Shewhart) cycle can be used to plan and make changes. This cycle, popularized by quality management expert Dr. W. Edwards Deming, consists of the following steps:

- Plan the change
- Do (pilot) the change
- Check (study) the change
- Act to refine and standardize the process

These steps are described in more detail in p. 5-39 through 5-40 of *The Team Handbook*.

3. Collect meaningful data – after a change is made to a process, data should be collected to make sure that the needs and goals of the process improvement have been achieved. This data can be compared to the data collected prior to the change made to the process in Six Sigma Step 2 – Measure.

Six Sigma Step 5 – Control

The fifth step in the Six Sigma process is to maintain the quality improvements resulting from the process improvement resulting from the Define, Measure, Analyze, and Improve steps of the Six Sigma process.

The chart on p. 5-26 of *The Team Handbook* lists some of the strategies that can be used in this step. The primary strategies for this step are:

- Develop a standard process
- Collect meaningful data
- Error-proof a process
- Streamline a process
- Reduce sources of variation
- Bring a process under statistical control
- Eliminate waste

1. Develop a standard process – this can also make use of the PDCA (Shewhart) cycle.

After documenting a process, perform the following steps:

- Plan a test of the process
- Do (pilot) the process
- Check (study) the process
- Act to refine and standardize the process

These steps are described in more detail in p. 5-49 through 5-50 of *The Team Handbook*.

2. Collect meaningful data – after a process has been improved, data should continue to be collected to make sure that the needs and goals of the process improvement have been maintained. This data can be compared to the data collected after the change made to the process in Six Sigma Step 4 – Improve.

3. Error-proof a process – mistakes in a process can often be prevented. Some of the ways to achieve this are listed on p. 5-31 of *The Team Handbook*:

- Change the order of the process steps
- Change a form
- Use a checklist
- Illustrate directions graphically
- Revise procedures to make them less error-prone

4. Streamline a process – streamlining a process reduces the total cycle time. This has the following advantages, listed on p. 5-53 of *The Team Handbook*:

- Improves customer service
- Reduces inventory expense
- Makes the organization work as a team
- Reduces errors and delays

Some of the ways to streamline a production process are discussed on p. 5-52 through 5-53 of *The Team Handbook*:

- Examine the value of each process step
- Reduce inventories
- Reduce lot sizes
- Reduce changeover and cycle times

5. Reduce sources of variation – variation of a process due to common causes (normal process variation) should be minimized to achieve a more uniform result of a product or service. Some sources of normal process variation are listed on p. 5-54 of *The Team Handbook*:

- People
- Machines
- Measurement instruments/inspectors
- Materials
- Operating conditions

- Different times of the day
- Different shifts

6. Bring a process under statistical control – processes should be monitored to ensure that special causes (unusual events) are not affecting the process, because special causes result in an unpredictable process. As shown on p. 5-57 of *The Team Handbook*, control charts are used to determine if a special cause is the cause of variation in the process result. This makes use of the PDCA (Shewhart) cycle with the following steps:

- Plan the chart
- Do (pilot) the chart
- Check (study) the chart
- Act to eliminate special causes

These steps are described in more detail in p. 5-56 through 5-57 of *The Team Handbook*.

7. Eliminate waste – processes should be evaluated to identify and eliminate waste, which is defined as an action that does not add value to a product or service. Sources of waste are listed on p. 5-58 through 5-59 of *The Team Handbook*:

- Defect/rework
- Overproduction
- Unnecessary processing
- Unnecessary transportation
- Excess inventory
- Unnecessary motion
- Waiting
- Not involving people in the process

Module 2 Summary

In Module 2, we learned how to:

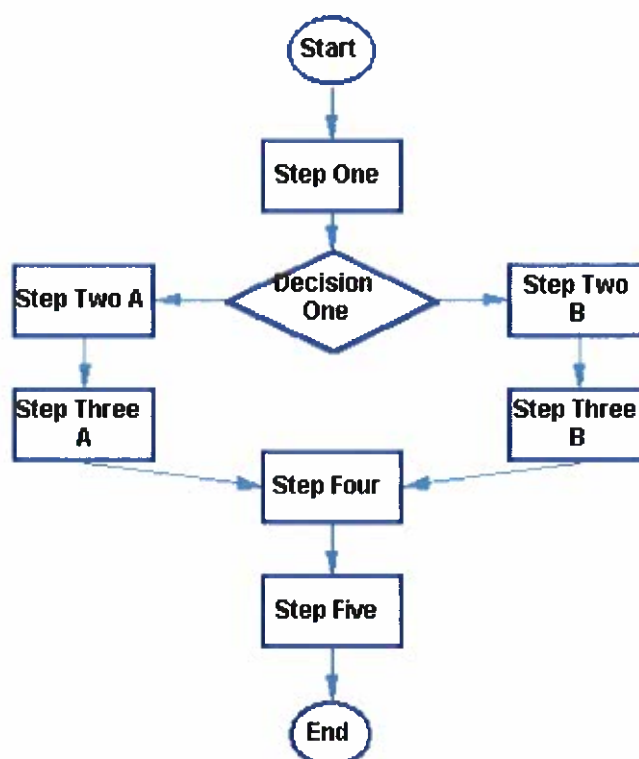
- Use the tools and techniques of Control Quality
- Define the strategies for Six Sigma steps 2 through 5

Quality Assignment 1

The first quality assignment is to address the first Six Sigma step, which is to define the purpose and scope of a process. The chart on p. 5-26 of *The Team Handbook* lists some of the strategies that can be used in this step. The primary strategies are:

- Identify customer needs
- Localize recurring problems
- Study the use of time
- Describe a process

1. Describe the process as it currently exists. Identify the boundaries of the process. Map/ diagram the current process in sufficient detail so that it can be understood. An example of a process diagram is shown as follows:



2. Identify recurring problems in the process and assess the impact of these problems on the results achieved by the process.
3. Assess what activities in the process are value-added, and what activities are non-value-added. What percentage of total process time is value-added time?
4. Identify the customers of the process. The list of customers should include not only immediate customers but also the eventual consumer or user of the product or service; not only current customers, but former and potential customers. Identify the needs of each customer.

Discussion Postings

Post your discussion posting by the date shown in the Syllabus. Discussion postings must be a minimum of 100 words. In order to obtain full credit, review and comment on a minimum of two other students' discussion postings within two days after the scheduled posting date. Please respond to comments on your discussion postings.

The discussion posting for Module 2 is:

1. What processes have you been involved with or are familiar with that have undergone process improvement?
2. What strategies/procedures/activities were used in this process improvement project?
3. What worked well? What didn't work as well? What would you suggest be done in a future process improvement project?