Chapter 15
Work Flows

Focus: This chapter describes the basic tools and techniques for analysis.

Introduction

❖ The tools and techniques for analysis help to improve the process, enhance work-flow efficiency, determine underlying or root causes, identify the vital few, and look at both sides of an issue.

❖ These tools and techniques are helpful in other steps of CDPM improvement methodology as follows:

  ❖ Process and work-flow analysis

  ❖ Cause-and-effect analysis

  ❖ Data statistical analysis

  ❖ Force-field analysis

Process analysis

❑ Process analysis is a tool used to improve a process by eliminating non-value-added activities, waits, and/or simplifying the process. The focus of process analysis is on specific defined outcomes.

❑ During the process analysis, the team first challenges the following:

  ❑ Excessive costs
  ❑ Inordinate waits
  ❑ Bureaucratic procedures
  ❑ Duplicate efforts
  ❑ Inspection or overseer operation
  ❑ Layers of approval
  ❑ Noncontributors to customer satisfaction.

Contd..

❑ Once the preceding have been examined, process simplification becomes the next step. This involves probing the high-cost and high-time processes for simple, innovative, and creative improvements in accomplishing the process.

❑ During this step, the team challenges the following:
   ❑ Complexity
   ❑ Unnecessary loops
   ❑ Frequency
   ❑ Methodology
   ❑ Use of technology
   ❑ Optimization of resources
   ❑ Innovative application of telecommunications and information systems.

Process Analysis steps

1. Construct a process diagram (top-down or detailed)
2. Ensure that waits between processes/activities are identified
3. Determine the time and cost of each process/activity and time of waits
4. Reduce or eliminate waits
5. Select critical activities (high time or cost)
6. Eliminate non-value-added processes/activities
7. Eliminate parts of the process
8. Simplify value-added processes/activities
9. Use CDPM improvement methodology to improve, invent, or reengineer the process.

Work Flow Analysis

➢ A work-flow analysis looks at a picture of how the work actually flows through an organization or facility.

➢ Work-flow analysis targets inefficiencies in the work motion.

➢ The work-flow analysis aims for identification and elimination of unnecessary steps and reduction of burdensome activities.

Work-flow Analysis steps

1. Define the process in terms of purpose, objectives, and start and end points

2. Identify functions of the organization or facility

3. Identify activities within each function

4. Identify tasks or basics steps within each activity

5. Using process diagram symbols or drawings of the organization or facility, graphically display the actual work flow.

Contd..

6. Analyze the work flow by identifying major activities, lengthy or complex tasks, decision points, and duplicate or repetitive tasks.

7. Check the logic of the work flow by following all possible routes through the organization and facility for all work activity to ensure that all possible alternatives are explored.

8. Determine improvement, invention, or reengineering opportunities.

Cause-and-Effect Analysis

❖ Cause-and-effect analysis is a useful technique for helping a group to examine the underlying cause(s) of a problem. The figure in the next slide shows a basic cause-and-effect diagram, which is a graphic representation of the relationships among a list of issues, problems, or opportunities.

❖ For a process to be improved or a problem to be solved, the action taken must target the real issue, the underlying or root cause.

❖ Cause-and-effect analysis begins with the issue or problem as the effect.

Cause-and-Effect Analysis steps

❖ Cause-and effect analysis steps can be summarized as follows:

1. Define the problem
2. Define the major categories
3. Brainstorm possible causes
4. Identify the most likely causes
5. Verify the most likely cause.

Data Statistical Analysis

❑ Data statistical analysis is an essential element of any CDPM endeavor.

❑ Statistics are used for many purposes in a CDPM environment, including problem solving, process measurement, and pass/fail decisions.

❑ Data statistical analysis includes tools for collecting, sorting, charting, and analyzing data to make decisions.

Data Statistical Analysis steps

❑ The steps in a data statistical analysis are:

1. Collect data
2. Sort
3. Chart data
4. Analyze data

Data collection methods

◆ Data must be collected to measure and analyze a process. There are many methods for data collection.

◆ Data collection methods include:
  - ➢ Observation
  - ➢ Questionnaires
  - ➢ Interviews
  - ➢ Tests
  - ➢ Work samples
  - ➢ Checksheets

Data collection sampling

- ☐ When collecting data for analysis, a sample of population may be all that is required.

- ☐ There are two common types of samples, nonrandom and random.

- ➢ **Simple random sampling**: simple random sampling can be accomplished by using a list of random digits or slips.

- ➢ **Stratified sampling**: stratified sampling divides the population into similar groups or strata.

The Central Limit Theorem

♦ The central limit theorem states that the mean (average) of the sampling distribution of the mean will equal the population mean (average) regardless of sample size and that as the sample size increases, the sampling distribution of the mean will approach normal, regardless of the shape of the population.

♦ The central limit theorem allows the use of sample statistics to make judgments about the population of the statistic.

Data Charting

➔ Charts are pictures of the data that highlight the important trends and significant relationships.

➔ Charts serve as a powerful communications tool and should be employed liberally to describe performance, support analysis, gain approval, and support and document the improvement process.

Contd..

⇨ The different types of charts are:

⇨ *Bar chart:* a bar chart is useful when comparing between and among many events or items.

⇨ *Pie chart:* a pie chart shows the relationship between items and the whole.

⇨ *Line chart*: a line chart is used when describing and comparing quantifiable information.

Analyzing the Data

⇨ Once the data have been collected, sorted, and put on charts, they are analyzed to identify the significant findings.

⇨ *Pareto analysis*: The Pareto principle states that a large percentage of the results are caused by a small percentage of the causes. This is sometimes referred to as the "80/20" rule.

Contd..

⇨ *variability analysis*: By examining the statistical data using statistical process control, deviations from target values can be monitored, controlled, and improved. Variability analysis is an essential tool of CDPM.

⇨ *Process-capability analysis:* process-capability analysis provides an indication of the performance of a process.

⇨ *Force-field analysis:* force-field analysis is a technique that helps a group describe the forces at work in a given situation. The underlying assumption is that every situation results from a balance of two forces i.e. restraining forces and driving forces.