Configuration & Data Management

(A Three Step Approach; Conception to Delivery, Training, and Development and use of Metrics)

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ABSTRACT

The decision-making process tasks Configuration & Data Management (CDM) administrators to change ways of managing/allocating the limited resources - people, money, energy, materials, space, and time - entrusted to them. To assist CDM decision makers in studying this process, studies have been conducted toward building a structured approach, which will enhance and fully utilize the decision-making process based on solid factual data. According to Dr. J.M. Juran (1989) "Decisions based on fact have always outperformed decisions based on hunch or empirical judgment."

The purpose of this study was to focus on how improvements could be accomplished within the CDM decision-making process. This involved questions concerning how to implement improvements in efficiency and effectiveness within an organization, as stated by Simon (1976, pg. 14):

> "...to be efficient simply means to take the shortest path, the cheapest means, toward the attainment of the desired goals."

This study was conducted, during the last year, within a Configuration & Data Management environment – in the early phases of development.

INTRODUCTION

To assist those CDM decision makers in studying the process, I suggest a structured approach to utilize the decision-making process based on solid factual data, gathered from a three (3) step approach; 1) Conception to Delivery, 2) CDM Training, and 3) Development of Metrics. This approach combines past thoughts, models, and training into the CDM decision-making process.

I do not advocate developing yet another theory in management, however I do suggest combining past thought with the present methods and models of CDM decision-making. This combination and integration can be accomplished through the thoughts of the Classical approach which emphasizes executive decision making responsibilities and that of the Behavioral approach which argued for more participatory decision-making procedures.

The CDM 3 Step Approach is based on a combination of the following management theories:

1. Scientific Management (Frederick Taylor's study of work processes.)
2. Human Relations Management (G. E. Mayo & F.J. Roethlisberger, Mary Parker Follett, etc.), study of what motivates an employee to become more efficient and how to understand the employee's needs.)

3. Participative Management (Ouchi, Peters, Deming, Juran, Senge, etc.), study of including employees in the decision-making process with approaches such as Quality Circles, Total Quality Management, Zero Defects, etc.)

It is with a solid approach that CDM decision makers can organize, make decisions, and properly utilize their limited resources. To implement this approach, the CDM decision maker must become familiar with the following tools:

1. Brainstorming
2. Group Consensus Techniques
3. Flowcharting
4. Control Charts
5. Cause and Effect Analysis
6. Pareto, Bar, and Pie Charts
7. Benchmarking

The necessity of using these tools is just another step toward a more focused approach in decision-making, according to E.M. Goldratt (1992, p. 48-49):

> "The first thing I'm trying to do is get a clear picture of what we have to do to stay in business,... If I can find some logical relationship between our daily operations and the overall performance of the company then I'll have a basis for knowing if something is productive or non-productive...moving toward the goal or away from it."

Numerous attempts to improve the process and motivate employees have occurred. However, an attempt to combine these ideas has not produced the desired effect of higher efficiency, according to Dr. J.M. Juran (1989, p. 342):

> "The decades since World War II have generated a series of waves of interest and publicity relative to various quality-related tools... Each of these tools has potential merit for companies. However none is broad enough to serve as the basis for taking a company into quality leadership."

Time has shown that managers act on different situations and processes without being focused on what the impact of their decision will be. In an interview with Industry Week Dr. W. Edwards Deming stated (1994, p. 21):

> "Management today does not know what its job is. In other words, [managers] don't understand their responsibilities. They don't know the potential of their positions. And if they did, they don't have the required knowledge or abilities. There's no substitute for knowledge."

The CDM 3 Step approach seeks to aid the CDM decision maker in gathering focused data, which will help in the decision to properly allocate the limited resources within the CDM organization.

The objectives are to realize the need for a paradigm shift to increase and improve the efficiency in the decision-making process within any organization, as stated by Covey (1990, pg. 33):

> "Two battleships assigned to the training squadron had been at sea on maneuvers in heavy weather for several days. I was serving on the lead battleship and was on watch on the bridge as night fell. The visibility was poor with patchy fog, so the captain remained on the bridge keeping an eye on all activities. Shortly after dark, the lookout on the wing of the bridge reported *"Light, bearing on the starboard bow." "Is it steady or moving astern?"* the captain called out. Lookout replied*, "Steady, captain,"* which meant we were on a dangerous collision course with that ship. The captain then called to the signalman, *"Signal that ship: We are on a collision course, advise you change course 20 degrees."* Back came a signal, *"Advisable for you to change course 20 degrees."* The captain said, *"Send, I'm a captain, change course 20 degrees." "I'm a seaman second class,"* came the reply. *"You had better change course 20 degrees."* By that time the captain was furious. He spat out*, "Send, I'm a battleship. Change course 20 degrees."* Back came the flashing light, *"I'm a lighthouse."* We changed course."

By applying the tools, in the decision-making process, the effectiveness of CDM can be realized and a paradigm shift can be accomplished.

CDM 3 Step - “The Toolbox”

The use of a solid set of tools aids in increasing and improving efficiency in each decision. As Woodrow Wilson, in his paper on "The Study of Administration" states; "Seeing every day new things which the state ought to do, the next thing is to see clearly how it ought to do them". (Shafritz & Hyde, 1992, p. 13)

TOOL #1. Brainstorming: This tool is a technique for generating a “shopping list” of ideas. This tool aids in generating a variety of thoughts in a short time and aids in producing new and creative ideas toward process improvement.

To brainstorm you meet with other employees and ask their help in gathering a list of ideas to improve a process. Brainstorming is used solely for generating ideas, and to help create as many ideas as possible, in the shortest time possible.

The following rules can apply in conducting brainstorming sessions:

- Look for Quantity not Quality.
- Never judge others about what they suggest, keep the open atmosphere going to build a list of ideas.
- Encourage the outrageous; never criticize.
- Insure all group members participate; everyone has something to contribute.
- Record all suggestions.

- Develop your listening skills (listen as an ally).

The results of a brainstorming session can be enormous, if a list is too long, the group can break it down by establishing and prioritizing that list, which involves the next tool called the Group Consensus Technique.

TOOL #2. GROUP CONSENSUS TECHNIQUE: These tool's can be useful in;

- Prioritizing a list of ideas.
- Making decisions using inputs from all members of the group.

To acquire this group consensus, all participating members arrive at an agreed upon decision and accept ownership of the decision made. A consensus must exist to work on the problem selected. Without the consensus, a resistance to any changes can occur. The Group Consensus Technique attempts to provide a way to give everyone in the group an equal voice. It is important to remember that consensus is not 100%; it is the ability to support the group's decision. The best way to accomplish this is to

- Have the team members identify or write down the problems they feel are most important.
- List all the problems.
- Each member provides input according to what he or she feels is the most important problem. This input can be done by listing the most important problem. For example, if there are five problem areas, give the number 5 to the most important; then the second most important problem is given the number 4; third most important given the number 3, etc.
- The team would then add up the numbers going across the scale.

- The problem with the highest total is the group's first process to work on.

This tool helps to eliminate subjectiveness and allows everyone to buy into the problem to be studied. Once the process has been identified, it is appropriate to chart the course further by using another tool called the flowchart.

TOOL #3. FLOWCHARTING: This technique is used in the mapping of your process. The flowchart is one of the most powerful, most used and least understood tools of process improvement. It is the graphic representation of all the major steps within a process. The flowchart helps

- Understand the complete process.
- Identify data gathering points.
- Identify the critical stages of a process.
- Locate potential problem areas.
- Identify duplication of efforts.
- Show relationships between different steps in a process.

The CDM decision maker can draw different processes with a technique called mental imaging. The technique uses the imagination of a person to mentally walk through the perfect way of doing a certain process.

These mental sequences allow a mapping of the steps a process should go through. The flowchart can then be compared against the steps a process actually goes through. The flowchart tool is a picture of a step-by-step, or operation-by-operation, sequence of activities that allows identification of repetitive activities. Without a picture no one will see the duplication.

The purpose of the flowchart is to document and understand the process as it is by examining and the questioning of every step to eliminate waste in time, energy, material, space, and equipment.

Another tool to help the CDM decision maker is called the Cause-and-Effect diagram.

TOOL #4. CAUSE and EFFECT: This technique is used to find the key cause(s) of the problem and to illustrate any similarities between factors that influence an area of concern. This tool is a focused form of brainstorming and it helps you to;

- Identify items that keep recurring.
- Focus on items with a continued group consensus.
- Have a structured approach to determine the root causes.
- Identify areas that may need further research or study.

When using this tool we repeatedly ask the questions "why?" to get at the real cause of the problem. Each "why" uncovers another layer of the problem and increases our chances of fixing the real problem.

This tool can be broken down to identify the 4 P's (People, Procedure, Policies, Plant) or to identify the 4 M's (Manpower, Methods, Machinery, Materials).

Once you have identified the problem areas you can begin taking measurements. To build you baseline, begin with the next tool called the Control Chart.

TOOL #5. CONTROL CHART: The control chart is a monitoring tool and allows insight into how a process can have variation over a certain time period. A process can be brought under control once you have data to measure and compare against. A control chart can:

- Help you see the variability in a process.
- Allow you to have data points to understand if the specifications established have been met. This is aided by the identification of two important points on the chart:
    1. The Upper Control Limit (UCL)
    2. The Lower Control Limit (LCL)
- Identification of what The Juran Trilogy calls "Sporadic Spikes" (Juran, 1989) or changes in a process. By observing these changes you can see how special circumstances can affect any process.

It must be remembered that special circumstances or special causes are just that and can be eliminated. By recognizing this factor you can better manage your efforts in identifying other common causes occurring within the process.

This control chart tool is extremely valuable for visualizing the different process and allowing you the opportunity to focus on the common cause. Other tools, that allow you to focus on a majority of causes, are called Pareto, Bar, and Pie Charts.

TOOL #6. PARETO, Bar, and Pie Charts: These tools simply provide a way to display and analyze your data. These tools can help you

- See the major problems to focus your improvement efforts on.
- Prioritize using gathered data not intuition.

- **Benchmarking:** This tool is simply a method to determine
  - Are there another organization using tools we are not using?
  - New or unexplored technology that might help break the next barrier?
  - New breakthrough procedures?
  - If we can incrementally improve our existing procedures?

Session 1: Hardware & Software CDM

Workshop #1: This session will present a "Conception to Delivery" overview of Hardware & Software development beginning with establishment of initial systems Engineering Requirements through the final release of the Hardware & Software developed.

CDM Tools needed from the Toolbox:

Tool #1. Brainstorming
Tool #2. Group Consensus Technique
Tool #3. Flowcharting
Tool #7. Benchmarking

Session 2: Hardware & Software CDM

Workshop #2: This session will present a training approach developed to keep CDM employees on track with the overall activities required of CDM personnel and information useful to prepare for the NDIA CDM Certification Exam.

CDM Tools needed from the Toolbox:

Tool #1. Brainstorming
Tool #2. Group Consensus Technique
Tool #7. Benchmarking

Session 3: Hardware & Software CDM

Workshop #3: This session will present how metrics are gathered and used in a Hardware & Software development environment, and how these metrics are used to properly manage and allocate CDM resources.

CDM Tools needed from the Toolbox:

Tool #1. Brainstorming
Tool #2. Group Consensus Technique
Tool #3. Flowcharting
Tool #4. Control Charts
Tool #5: Cause and Effect Analysis
Tool #6. Pareto, Bar, and Pie Charts
Tool #7. Benchmarking

CONCLUSION

Through the use of the CDM 3 Step Approach much has been learned that when processes are analyzed, the CDM decision maker has the ability to explore the decision-making process and discover whether there are any areas toward continuous improvement that were not adequately addressed, i.e.,

- Goals for future CDM improvement.
- Areas to enhance training enhancements.
- Selection of valid performance measures.
- Gathering of internal and external feedback on current performance.

This study does not conclude the efforts expended up to this point by the CDM organization. CDM will continue to monitor and measure the progress of each Hardware & Software development activity (long term direction vs. short term direction). This collection of data will be valuable in continually questioning the decision-making process and will be helpful in determining whether efficient CDM decision are being made.

REFERENCES

Carneval, D.G. (1995). Trustworthy government: leadership and management strategies for building trust and high performance. 1st ed., San Francisco, CA. Jossey-Bass Publishers, p. 82.

Covey, S.R. (1990). The seven habits of highly effective people: restoring the character ethic. 1st Fireside ed., New York, NY. Fireside.

Deming, W.E. (1994). Management today does not know what its job is. January edition, Industry Week, p. 21 -28.

Goldratt, E.M., Cox, J. (1992). The goal: a process of ongoing improvement. 2nd revised ed., New York: North River press, p. 48-49.

Juran, J.M. (1989). Juran on leadership for quality: an executive handbook. New York: The Free Press, p. 278.

Pearce, J.A., Robinson, R.B. Jr. (1997). Formulation, implementation, and control of competitive strategy. 6th ed., Boston Mass., Irwin, McGraw-Hill Companies, Inc.

Senge, P.M. (1990). The fifth discipline: the art and practice of the learning organization. 1st ed., New York, NY, Doubleday.

Shafritz, J.M., Hyde, A.C., (1992). Classics of public administration, 3rd ed., Belmont CA, Wadsworth Publishing Company, p. 13

Simon, H.A. (1976). Administrative behavior: a study of decision-making processes in administrative organization. 3rd ed., New York NY, The Free Press.