Basic Tools

Four Basic Tools For Organizing and Quantifying "IDEA DATA". - (Part 2)

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In the first part of this basic tools paper I presented the following process for using these tools to collect, organize, and quantify "idea data."

Step 1. Gather together the right team of people.
Step 2. Brainstorm ideas on the central theme.
Step 3. Complete an Affinity diagram of the collected ideas.
Step 4. Complete an Interrelationship digraph(ID) of the headers from the Affinity diagram.
Step 5. Complete a tree diagram, using the analysis of the Affinity diagram and the ID.
Step 6. Prioritize the information in the tree diagram, using a Prioritization matrix.
Step 7. Take action on the critical few!

In Part 1, I discussed the first four steps of the process. These steps included most of the creative process for organizing "Idea Data". Steps 1 and 2 are the critical steps for collecting many ideas in a brief time. Steps 3 and 4 result in the creative synthesis of the brainstormed ideas into a few key themes.

In Part 2 of the paper I will discuss the last three steps of the process. Steps 5 and 6 are the more logical steps of the process, which lead to the quantification of the "Idea Data". Once the data has been quantified it will be easier to identify an action plan for optimum use of limited resources in Step 7.

Step 5. Complete a tree diagram, using the analysis of the Affinity diagram and the ID.

The tree diagram builds on a central theme or idea by continually asking the question, "What must be done to complete this idea?" It is designed to map out in increasing detail all of the tasks and activities needed to achieve the primary goal. Often, the initial idea or theme of your project will be the "trunk" of the tree and the major branches will be identified by analyzing the Affinity diagram and the ID. However, you shouldn't assume this to always be true. Sometimes analysis of the Affinity diagram and the ID will identify the key "trunk" of the tree.

The tree diagram is the direct link from the "idea data" to more quantitative data. Once your ideas are in the form of a tree, you will be able to use a prioritization process to develop quantitative values for each level of the tree.

The process for completing the tree diagram is:

1. Decide on the primary goal(i.e. The trunk of the tree). This goal will almost always come from either the analysis of the ID or, less often, the analysis of the Affinity diagram. In most cases, there will be an obvious "driver" identified in the ID that is the most important goal of your project. There could be two or three of these "drivers" in which case they usually are the main branches of a tree that starts with the original theme of the project. There is no easy "This is the way it is" answer to the question, "Where should we start the tree?". Every project is unique and experience and discussion is your best tools when making this decision.

2. Discuss the relationships in the ID and the Affinity and identify the major branches of the tree by asking, "What are the ideas or tasks needed to complete the idea or task to the left?".

3. Repeat step 2 for each of the major branches. You should take all branches of the tree to the same level of detail. This will allow for prioritization at the next step.

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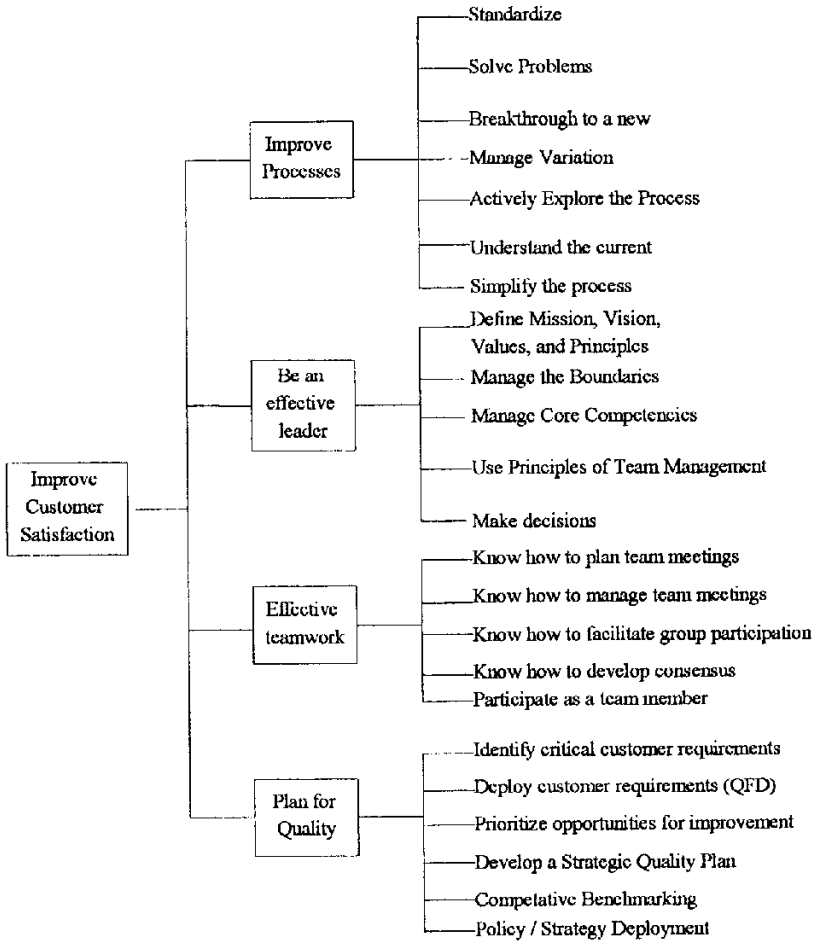
Often, when the tree is near completion, more information will have to be added that was not in the initial Affinity. Create new cards to fill in the details at each level of the Tree diagram. The branching to the right of a goal must always include enough information to achieve the goal to the left.

4. Review the completed tree for logical flow from left to right. This tool is designed to present a logical map of the steps needed to accomplish the goal at the trunk of the tree. Have the team review the tree and discuss the likelihood that these steps will actually lead to achieving the goal. Also discuss whether you really need to do all of the steps. My experience shows a tendency for the teams to want to include everything on the tree that was in the ID and the Affinity diagram. Often there is information in the ID and the Affinity diagram that is not required to complete the goal.

The following tree diagram was developed by the Statistics Division to identify the critical needs of the members.



Step 6. Prioritize the information in the tree diagram, using a Prioritization matrix.

The prioritization matrix is the tool that helps you focus on the most important or critical options or actions to pursue. The purpose of the prioritization step is to agree on a quantitative importance or weighting for each of the elements at a given level in the Tree diagram. With this data you can plan your actions based on what are the most important or critical activities. There are several ways to prioritize the information in the Tree diagram. I have had success using a simple prioritization matrix, which lists the options to be prioritized on both the vertical and horizontal axes of an "L-matrix" and then compares each option with each of the other options. For a more complete discussion of other methods of prioritization refer to the "Memory Jogger Plus+", Chapter 4. They describe this method in more detail and two alternative methods for prioritization. For a complete theoretical discussion of prioritization, refer to Thomas L. Saaty's book, Decision Making for Leaders, University of Pittsburgh, 1988.

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The process for prioritization is:

1. Agree on the criteria against which to prioritize. This is generally a statement such as, "Is Option A more important to achieving the goal(the "trunk" of the tree) than Option B?". Make sure your team takes the time to discuss and agree on this question. The clearer the criterion is the easier the prioritization of the elements will be.

2. List the elements on both the horizontal and vertical axes of an "L-matrix." Record a series of ones(1) down the diagonal where the options are compared to themselves(i.e. A to A, B to B, etc.).

3. Asking the question developed in 1. above, start with the first row and compare the importance of that option to every other option in the columns using some type of numerical scale. For example, I generally use to scale: 1 = Equally important, 5 = Strongly more important, 9 = Extremely more important, 1/5 = Strongly less important, 1/9 = Extremely less important. You can also use 3 and 7 to increase the options or you can decide to choose any other scale that makes sense to you. As you decide each importance rating for a given row and column, record the inverse of the rating in the mirror image location of the matrix. For example, if you record a 5 in Row A/Column B, you would record a 1/5 in Row B/Column A. This is simply stating that Option A is strongly more important than Option B(Row A/Column B), which means Option B is strongly less important than Option A(Row B/Column A). Continue the analysis row by row until the entire matrix is complete. This data is represented on the top line of each cell in the matrix below.

Question: How important are these needs toward improving customer satisfaction from the perspective of technically-focused members?

	Improve Processes	Be an Effective Leader	Have Effective Teamwork	Plan for Quality	Prioritized Weights	Normalized Weights
Manage / Improve Processes	1 .32	7 .39	1 .31	1 .31	1.33	0.32
Be an Effective Leader	1/7 .05	1 .06	1/5 .06	1/5 .06	0.22	0.06
Have Effective Teamwork	1 .32	5 .28	1 .31	1 .31	1.22	0.31
Plan for Quality	1 .32	5 .28	1 .31	1 .31	1.22	0.31
Column Totals	3.14	0.18	3.2	3.2	4	1

4. Sum each column and divide each cell in the column by that sum. Record this value below the importance rating. For example, in the matrix above, Manage/Improve Processes is 0.32 of the sum of 3.14 for that column. Continue this step for each column of the matrix.

5. Sum each row from step 4. This leads to the Prioritized weights listed above.

6. Finally, normalize the Prioritized weights using the method described in Step 4.

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7. The process can easily be repeated for the next level of the tree diagram. To do this build a matrix for each of the branches of the tree using the "leaves" of that branch in the matrix. When all of the "leaves" have been normalized, you can assign the normalized portion of the branch total (i.e. Plan for Quality has a normalized weight of 0.31. This weight can be divided up by the normalized weight of each of the leaves on that branch. Thus, when the leaves are added up they will total 0.31.)

   You are now in a position to identify which of the major projects to take action on. In this example, three of the four were weighted almost the same. It would be important to develop action plans for all three in this case. More often you will discover one or two dominant themes in your analysis.

Step 7. Take action on the critical few!

We all have tools and techniques to apply in the action step. Usually our problem is waiting to take action until we have identified what to take action on. Using this process you will have identified what is important and be in a much more informed position to go for it!

Case Studies

How can this be applied? What can I use the process on? These are the types of questions I am asked about the process.

The statistics division has used this process several times. We first used it to develop the "House of Education," which is described in the spring special edition of the newsletter. If you are interested in a case study with examples, this is the example I would recommend.

I have used this process in both strategic and operational planning for a business unit. We had always been good at product planning, but didn't often spend the time to plan for the longer term strategic issues. The process has been very useful in identifying the three to five critical issues facing a business 5 to 10 years into the future. We then use the same process to develop yearly operational plans which link to the strategic plan.

I have an associate who used the process to select the best production alternatives for a community theater group. They had always selected their plays based on who liked what plays in the group. They used this process to compare the needs of the customers, the community, the facility, and the theater group. They came up with a prioritization tree which they now use whenever selecting a new production.

The uses are endless. Whenever you are faced with a situation where people have many ideas or competing issues it will be beneficial to spend the time to follow this process. You will invariably come out with high quality results.

If there was only one piece of advise I could give it would be to ***Trust the Process***. Many times when teams are in the middle of Steps 2 and 3 especially, they question what is going on and is it going to do any good. I can only state that **every time** I have been involved in a project using this process the feedback from the entire group was; "Thank goodness we stuck with it, the results were worth the wait."

References

Brassard, Michael. "The Memory Jogger Plus+‰", Goal/QPC, Methuen, MA

Saaty, Thomas L. "Decision Making for Leaders", University of Pittsburgh, Pittsburgh, PA