

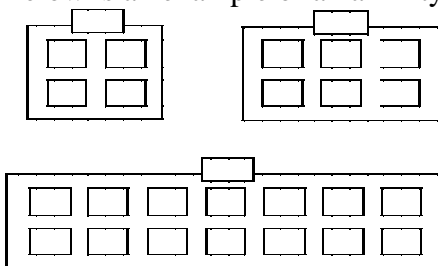
The New Seven Tools of Quality

The Affinity Diagram

This Affinity Diagram is a very useful tool to use when brainstorming is the main goal. This is an especially effective tool because it allows the participants to be both creative and logical. By generating ideas the participants are tapping into their creative side, and organizing those ideas allows them to exercise logic. According to <http://www.Pekin.net>, there are 3 main instances when an affinity diagram is especially useful. First, when the problem is complex or hard to understand. Second, when the problem is very large and could appear to be overwhelming. Last, when support and involvement of another group is required. There are six basic steps to creating an affinity diagram:

1. Identify the problem or issue
2. Each person writes issues related to problem on note card or sticky notes
3. Organize the cards or sticky notes into logical piles
4. Name each pile with a header
5. Draw an affinity diagram
6. Discuss the piles created

Below is an example of an affinity diagram:



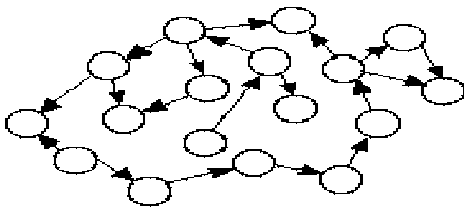
The Interrelationship Digraph

The main purpose of the interrelationship digraph is to depict the relationships between different issues. Often times this digraph is used in conjunction with the affinity

diagram. It can be very powerful in that it reveals the impact one issue can have on other issues. There are seven steps to create an interrelationship diagram:

1. Identify problem or issue
2. Write each element that relates to problem in a box
3. Draw arrows from the element that influences to the element that is influenced
4. Draw the strongest influence if two elements impact each other
5. Count the arrows
6. Elements with the most outgoing arrows will be root causes or drivers
7. The elements with the most incoming arrows will be key outcomes or results

Below is an example of an interrelationship digraph:

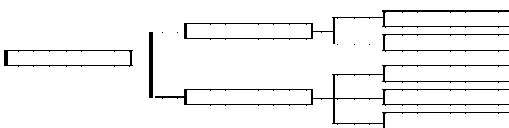


Tree Diagram

A tree diagram is often used to discover the steps needed to solve a given problem. It allows the user(s) to gain further insight into the problem and helps the team focus on specific tasks to complement the tasks at hand to solve the problem. There are five major steps in creating a tree diagram. They are:

1. Determine the main goal
2. Be concise
3. Brainstorm the main tasks involved in solving the problem and add them to the tree
4. Brainstorm subtask that can also be added to the tree
5. Do this until all possibilities have been exhausted

Below is an example of a tree diagram:

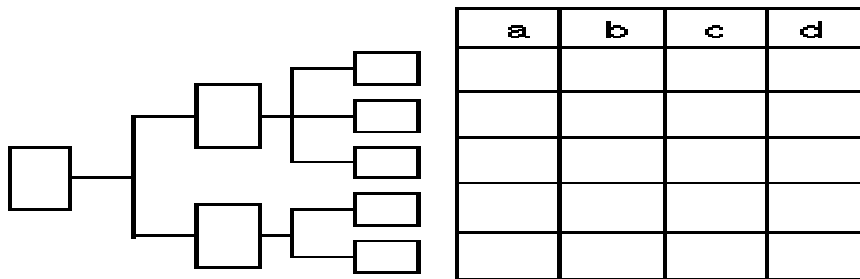


Prioritization Grid

A prioritization grid is typically used to make decisions that require analysis of several criteria. These situations could have several options that need to be compared and several criteria that need to be considered. There are eight steps to develop a prioritization grid. They are:

1. Identify your goal
2. Rank the criteria in order from least important to most important
3. Assign each criterion a weight for each option, and be sure the sum of all weights equals one
4. Sum the individual rating for each criterion to come to an overall ranking. Divide by the number of options to find an average ranking.
5. Rank order each option with respect to the criteria. Average the rankings and apply a completed ranking
6. Multiply the criteria weight by its associated criterion rank for each criterion in the matrix. The result in each cell of the matrix is called an importance score
7. Sum the importance scores for each alternative
8. Rank the alternatives in order of importance

Below is an example of a prioritization grid:



Matrix Diagram

The matrix diagram is a good tool to use to compare the efficiency and effectiveness of alternatives based on the relationship between two criteria. It uses criteria and symbols to visually depict the relationship between. For example, a user could analyze the relationship between cost and performance. Matrix diagrams can be used with up to four dimensions. There are several styles of matrix diagrams. The most common styles are the L-shape, the T-shape, and the Y-shape. There are five steps in constructing a matrix diagram.

1. Decide the factors that are the most important to make the decision
2. Select the style of matrix that will help the best
3. Select the symbols to be used to represent the relationships
4. Complete the matrix using the determined factors and symbols
5. Analyze the completed matrix

Below is an example of a matrix diagram:

a	b	c	d

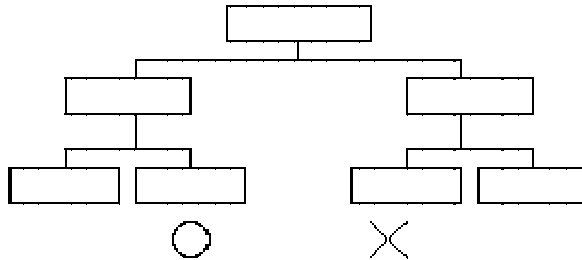
Process Decision Program Chart

The Process Decision Program Chart is a good tool to use for contingency planning. It helps to realize what could go wrong or problems associated with the implementation of programs and improvements. There are four main steps to creating a Process Decision Program Chart. They are:

1. List the steps in the process you wish to analyze
2. List what could go wrong at each step
3. List the counter measures to the problems

4. Evaluate the counter measures by placing an O for feasible or an X for not feasible

Below is an example of a Process Decision Program Chart

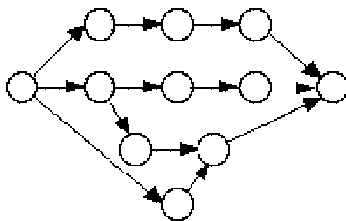


Activity Network Diagrams

The Activity Network Diagram is also known as the PERT diagram or the critical path diagram. It evaluates the time it takes from the beginning of a process to the end of a process and determines where there is slack time, and what parts of the process can be improved in relation to time. There are several steps in developing an Activity Network Diagram. They are:

1. List all tasks
2. Determine the time it takes for each task
3. For each task, determine the task that must happen before the current task can take place
4. Draw the network diagram
5. Compute early start and early finish times for each task
6. Compute the late start and late finish times for each task
7. Compute slack time
8. Determine the critical path

Below is an example of an Activity Network Diagram:



Where to find more information regarding the new seven tools of quality:

Foster Jr., S. Thomas. Managing Quality: An Integrative Approach. New Jersey:
Prentice Hall, 2001

<http://www.goalqpc.org/nonflash/whatweteach/RESEARCH/>

<http://www.goalqpc.org/nonflash/whatweteach/RESEARCH/7mp.html>

<http://www.pekin.net/>

<http://www.skymark.com/resources/tools/>

<http://www.uvm.edu/~auditwww/tools/?Page=interrel.html>

<http://www.systema.com/tqmtools/>

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