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Analysis Of Selected Problem

Once a major problem has been selected, it needs to be analyzed for possible causes. Cause-and-effect diagrams and flow charts can be used in this part of the process.
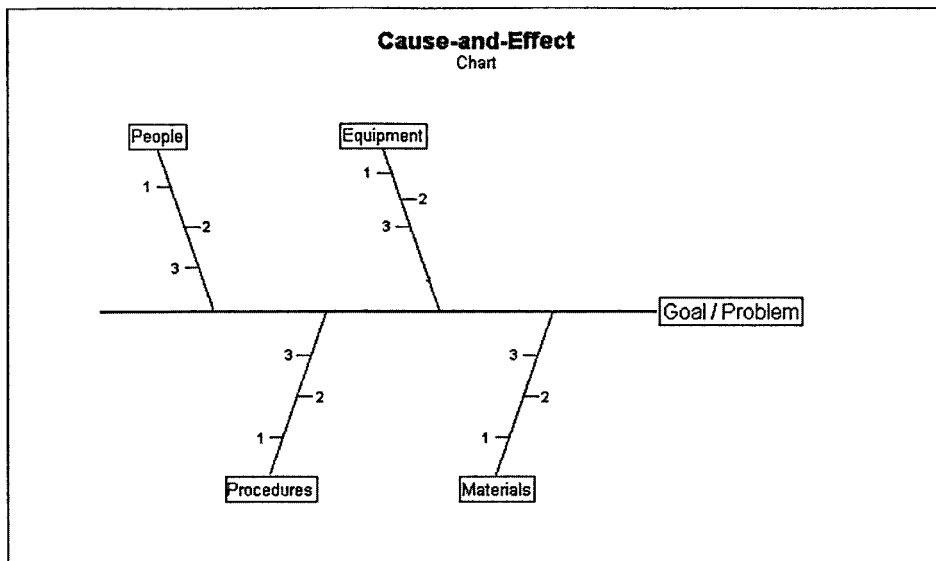
1.   Cause-and-Effect or Fishbone Diagram

One analysis tool is the Cause-and-Effect or Fishbone diagram. These are also called Ishikawa diagrams because Kaoru Ishikawa developed them in 1943. They are called fishbone diagrams since they resemble one with the long spine and various connecting branches.

The fishbone diagram organizes and displays the relationships between different causes for the effect that is being examined. This chart helps organize the brainstorming process. The major categories of causes are put on major branches connecting to the backbone, and various sub-causes are attached to the branches. A tree-like structure results, showing the many facets of the problem.

The method for using this chart is to put the problem to be solved at the head, then fill in the major branches. People, procedures, equipment and materials are commonly identified causes.

This is another tool that can be used in focused brainstorming sessions to determine possible reasons for the target problem. The brainstorming team should be diverse and have experience in the problem area. A lot of good information can be discovered and displayed using this tool.

Cause-and-Effect
Chart

People

Equipment

1

2

3

1

2

3

Goal / Problem

3

2

1

3

2

1

Procedures

Materials

10

2. *Flowcharting*

After a process has been identified for improvement and given high priority, it should then be broken down into specific steps and put on paper in a flowchart. This procedure alone can uncover some of the reasons a process is not working correctly. Other problems and hidden traps are often uncovered when working through this process.

Flowcharting also breaks the process down into its many sub-processes. Analyzing each of these separately minimizes the number of factors that contribute to the variation in the process.

After creating the flowchart, you may want to take another look at the fishbone diagram and see if any other factors have been uncovered. If so, you may need to do another Pareto diagram as well. Quality Control is a continual process, in which factors and causes are constantly reviewed and changes made as required.
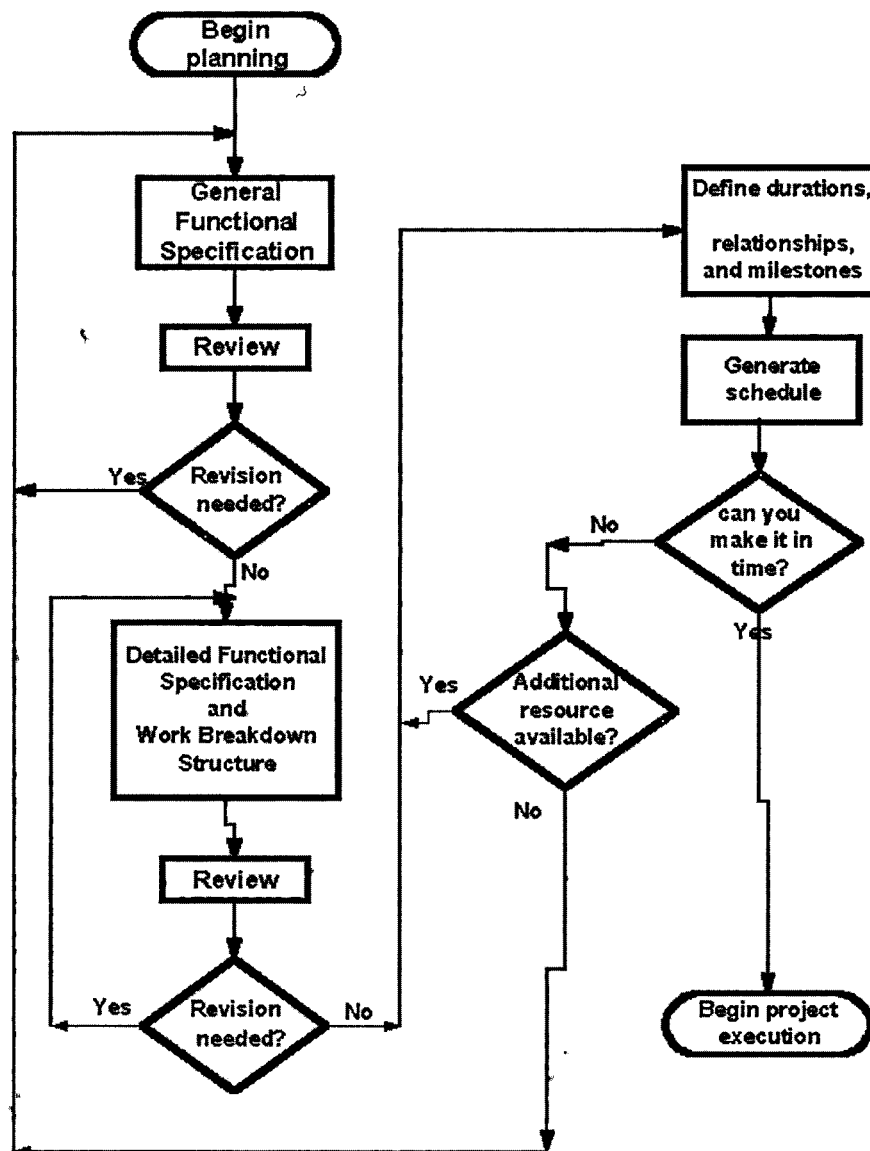
Flowcharts use a set of standard symbols to represent different actions:

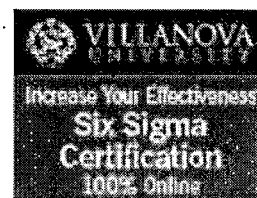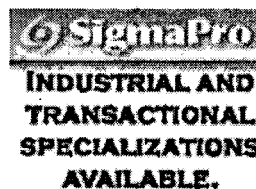**Circle / Oval** - Beginning or end

Square - A process, something being done

Diamond - Yes / No decision

PRODUCT DEVELOPMENT

The Cause and Effect (a.k.a. Fishbone) Diagram

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The cause and effect (fishbone) diagram will help you visually display the many potential causes for a problem or effect. Don't be fooled by tool rules; Kerri Simon teaches you to modify the tool for your specific project and subject matter. Free templates are included so you can begin using this tool today.

When utilizing a team approach to problem solving, there are often many opinions as to the problem's root cause. One way to capture these different ideas and stimulate the team's brainstorming on root causes is the cause and effect diagram, commonly called a fishbone. The fishbone will help to visually display the many potential causes for a specific problem or effect. It is particularly useful in a group setting and for situations in which little quantitative data is available for analysis.

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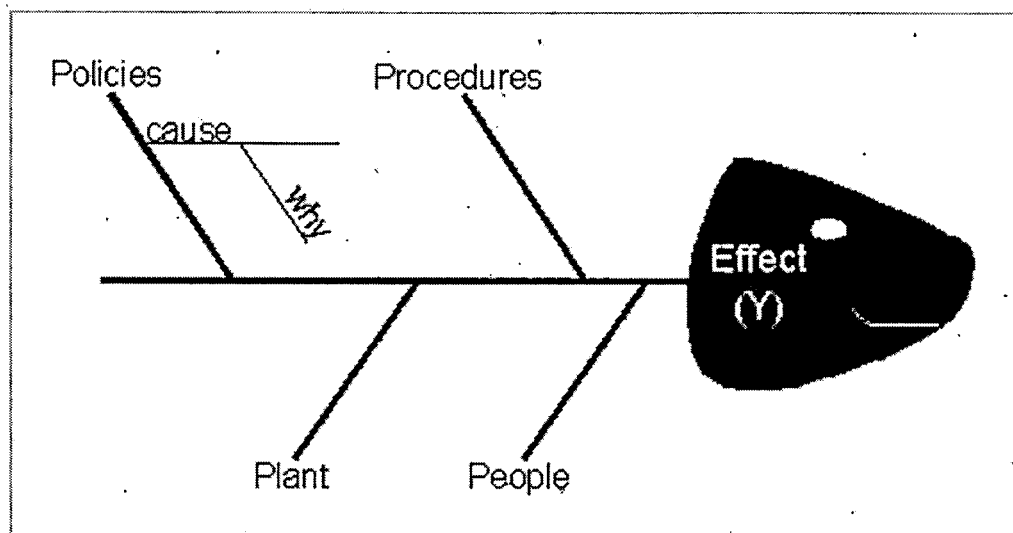Most Practical DOE Explained (Free Template!)

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The fishbone has an ancillary benefit as well. Because people by nature often like to get right to determining what to do about a problem, this can help bring out a more thorough exploration of the issues behind the problem - which will lead to a more robust solution.

To construct a fishbone, start with stating the problem in the form of a question, such as 'Why is the help desk's abandon rate so high?' Framing it as a 'why' question will help in brainstorming, as each root cause idea should answer the question. The team should agree on the statement of the problem and then place this question in a box at the 'head' of the fishbone.

The rest of the fishbone then consists of one line drawn across the page, attached to the problem statement, and several lines, or 'bones,' coming out vertically from the main line. These branches are labeled with different categories. The categories you use are up to you to decide. There are a few standard choices:

Table 1: Fishbone Suggested Categories

Service Industries (The 4 Ps)	Manufacturing Industries (The 6 Ms)	Process Steps (for example)
• Policies	• Machines	• Determine Customers

• Procedures
• People
• Plant/Technology
	• Methods
	• Materials
	• Measurements
	• Mother Nature
	  (Environment)
	• Manpower
	  (People)
		• Advertise Product
		• Incent Purchase
		• Sell Product
		• Ship Product
		• Provide Upgrade

You should feel free to modify the categories for your project and subject matter.

Once you have the branches labeled, begin brainstorming possible causes and attach them to the appropriate branches. For each cause identified, continue to ask 'why does that happen?' and attach that information as another bone of the category branch. This will help get you to the true drivers of a problem.

Figure 1: Fishbone Diagram Example

Once you have the fishbone completed, you are well on your way to understanding the root causes of your problem. It would be advisable to have your team prioritize in some manner the key causes identified on the fishbone. If necessary, you may also want to validate these prioritized few causes with a larger audience.

The following fishbone templates are for immediate download and use. There are two versions: Microsoft Word and Excel.

Fishbone Template, Microsoft Word (.DOC)

Fishbone Template, Microsoft Excel (.XLS)

Viewing Tip: Usually, you can click on the icon link above to view the document in a new window -- it may open within your browser using the application (in this case either Word or Excel). If you are having difficulty, try right clicking the link and selecting "Save Target As..." or "Save As..." to save it to your computer harddrive.

Tagged under Cause & Effect Template Fishbone

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