



# FISHBONE DIAGRAMS

## PURPOSE

The fishbone diagram is a cause-and-effect diagram that can be used to identify the potential (or actual) cause(s) for a performance problem. Fishbone diagrams provide a structure for a group's discussion around the potential causes of the problem.

## NEEDS ASSESSMENT APPLICATIONS

Fishbone diagrams are often used in needs assessment to assist in illustrating and/or communicating the relationships among several potential (or actual) causes of a performance problem. Likewise, these graphical representations of relationships between needs (i.e., discrepancies between desired and actual results) offer you a pragmatic tool for building a system of performance improvement interventions (for instance, a combination of mentoring, job aids, training, motivation, new expectations) around the often complex relationships found across potential (or actual) causes.

## ADVANTAGES AND DISADVANTAGES

### ADVANTAGES

- Fishbone diagrams permit a thoughtful analysis that avoids overlooking any possible root causes for a need.
- The fishbone technique is easy to implement and creates an easy-to-understand visual representation of the causes, categories of causes, and the need.
- By using a fishbone diagram, you are able to focus the group on the "big picture" as to possible causes or factors influencing the problem/need.
- Even after the need has been addressed, the fishbone diagram shows areas of weakness that - once exposed - can be rectified before causing more sustained difficulties.

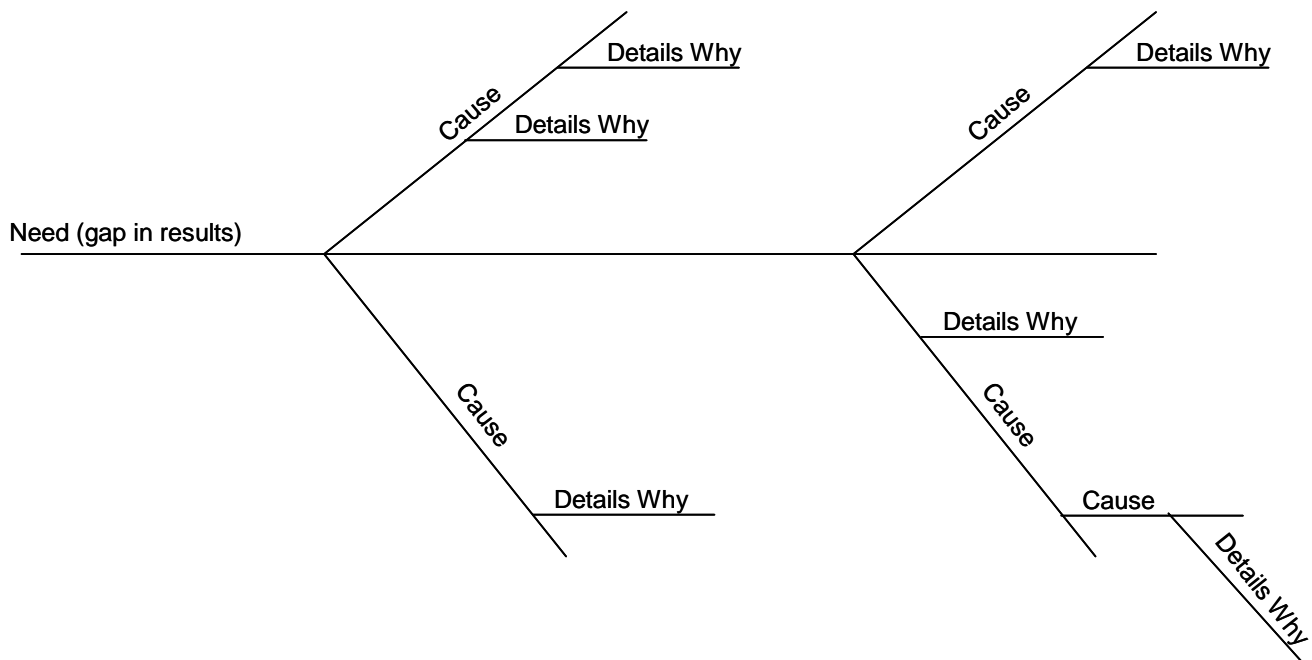
### DISADVANTAGES

- The simplicity of a fishbone diagram can be both its strength and its weakness. As a weakness, the simplicity of the fishbone diagram may make it difficult to represent the truly interrelated nature of problems and causes in some very complex situations.
- Unless you have an extremely large space on which to draw and develop the fishbone diagram, you may find that you are not able to explore the cause and effect relationships in as much detail as you would like to.

## GENERAL PROCEDURES

1. Identify gaps between the results (i.e., performance) that are required for the successful accomplishment of your programs/projects results chain (i.e., logic frame) and current achievements to-date.
2. Generate a clear, concise statement of the need(s). Make sure that everyone in the group agrees with the need as it is stated. For example, the application of modern agricultural techniques among the population is at 25% and the aim of your program/project is for 75% of the population to use modern techniques (leaving you with a gap or need of 50%).
3. Using a long sheet of paper, draw a line horizontally along the page. This line will be the "spine" of the fish. Write the need along the spine, on the left hand side.
4. Identify the overarching categories of causes of the need. Brainstorming is often an effective technique for identifying the categories of causes. For each category of causes, draw a "bone" - a line at a 45 degree angle from the spine of the fish. Label each spine (see Figure 1).

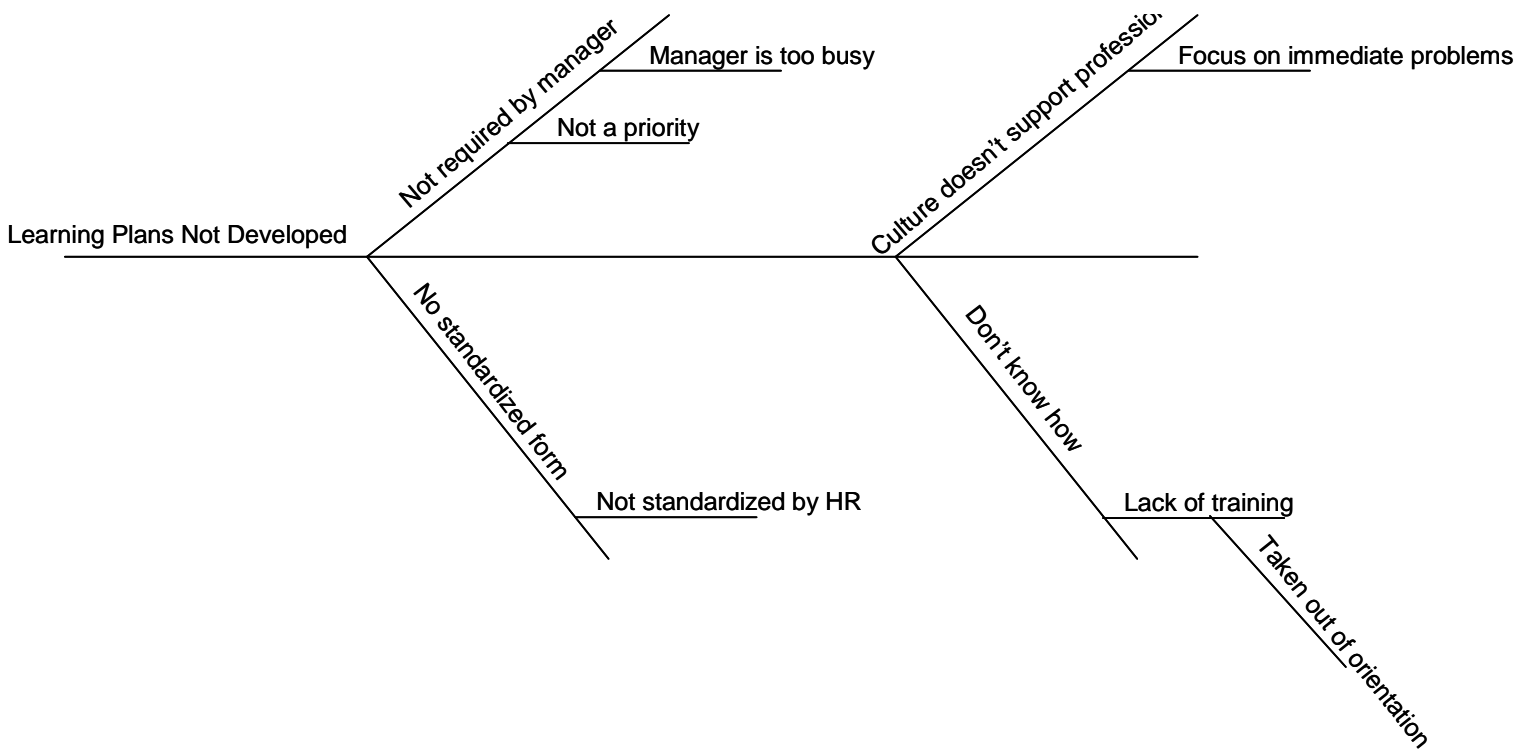
Figure 1: A Basic Fishbone Diagram



5. Have the group brainstorm to identify the factors that may be affecting the cause and/or the need. For each category of causes, the group should be asking; "Why is this happening?" Add each "reason why" to the diagram, clustered around the major cause category it influences.
6. Repeat the procedure for asking "Why is this happening" for each effect, until the question yields no more meaningful answers (see Figure 2).

7. When the group has come to the consensus that the diagram contains an adequate amount of information, analyze the diagram. In particular, look for causes that are appearing in more than one section of the diagram.
8. Circle anything that seems to be a root cause for the need. Prioritize the root causes and decide to take action. This action may involve further investigating the root causes.

Figure 2: An Annotated Fishbone Diagram



## TIPS FOR SUCCESS

- Make sure that there is consensus in the group about both the “need” and the characteristics of the “cause statement” before beginning the process of building the fishbone diagram.
- If appropriate, you can “graft” branches that do not contain a lot of information onto other branches. Likewise, you can “split” branches that have too much information into two or more branches as you go.
- Make parsimonious use of words while populating the fishbone diagram. Only use as many words as necessary to describe the cause or effect.

## REFERENCES AND RESOURCES

Gupta, K., Sleezer, C.M., & Russ-Eft, D.F. (2007). *A Practical Guide to Needs Assessment*. Pfeiffer

## WEB SITES

Use a Fishbone Diagram to help attack complex problems (from TechRepublic):

[http://articles.techrepublic.com.com/5100-10878\\_11-6092236.html?tag=nl.e053](http://articles.techrepublic.com.com/5100-10878_11-6092236.html?tag=nl.e053)

Cause Analysis Tools (from American Society for Quality; has an example of a fishbone diagram):

<http://www.asq.org/learn-about-quality/cause-analysis-tools/overview/fishbone.html>

The Fishbone Diagram (from Six Sigma; has templates for making fishbone diagrams in Microsoft Word and Microsoft Excel):

<http://www.isixsigma.com/library/content/t000827.asp>