

# Job Aid: Analytical Approach Problem-Solving Model

This job aid presents a detailed description of the analytical approach process, including checklists and worksheets, and can be printed as desired. This decision-making process involves six steps:

- Step 1: Identify the problem
- Step 2: Determine root cause
- Step 3: Explore alternatives
- Step 4: Select an alternative
- Step 5: Implement the solution
- Step 6: Evaluate the situation

## Step 1. Identify the Problem

Problem identification is undoubtedly the most important and the most difficult step in the process. All subsequent steps will be based on how you define and assess the problem at hand.

### What Is a “Problem”?

A problem is a situation or condition of people or the organization that will exist in the future, and that is considered undesirable by members of the organization.

### Problem or Solution?

In carrying out Step 1, you must distinguish between a problem and its solution. The most common error in problem solving is defining problems in terms of their solutions. Sometimes people think that they are articulating problems when actually they are stating a potential solution.

For example, someone might say, “The problem is that we don’t have an EOC.” The problem, however, is not that there is no EOC. The problem is really that the emergency management community cannot coordinate communications adequately during the response phase. Establishing an EOC is a solution.

### Delineating the Problem Parameters

Identifying the problem also involves analyzing the situation to determine the extent of the problem. Problem parameters include:

- What is happening (and is not happening).
- Who is involved.
- What the stakes are.

## Checklist for Identifying, Defining, Analyzing Problems

Answer this set of questions to help define a problem accurately.

1. Is this a new problem?                      Yes                      No
2. Is the problem clearly and precisely stated?                      Yes                      No
3. What assumptions am I making about the problem?
4. Are the assumptions true?                      Yes                      No
5. Can the problem be restated in simpler terms?
6. What data will help measure the problem?

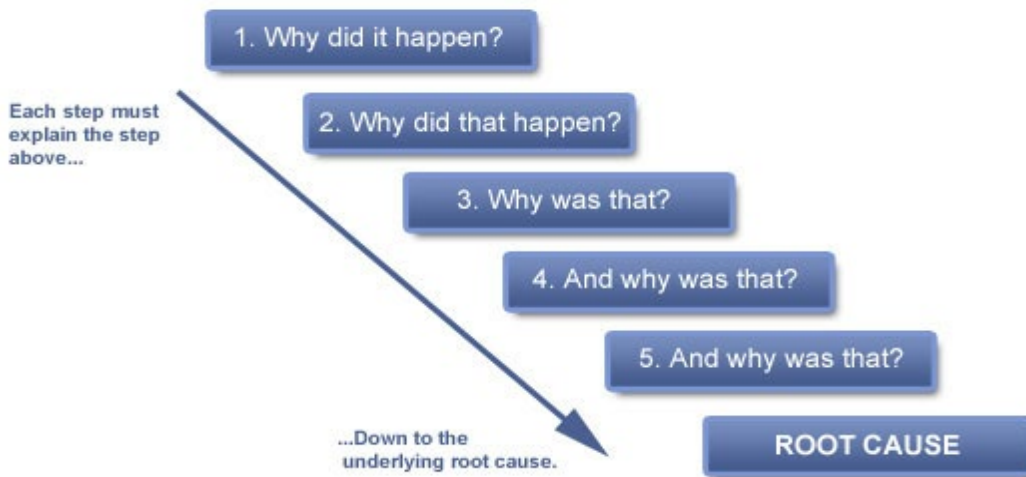
## Step 2. Determine the Root Cause

The second step in the decision-making process is to determine root cause(s) to the problem identified in step 1. There is no single approach to conducting a root cause analysis. Two commonly used techniques, which are relatively easy to learn and effective if applied correctly, include the following:

1. Why Staircase (also known as the “5 Whys”)
2. Fishbone diagram (cause-and-effect diagram)

### The Why Staircase

Identifies the root cause of a problem by consecutively asking and answering a series of dependent questions about why something occurred. It may be necessary to ask “why” more or fewer than 5 times to arrive at a root cause. The number 5 is merely a general guideline.

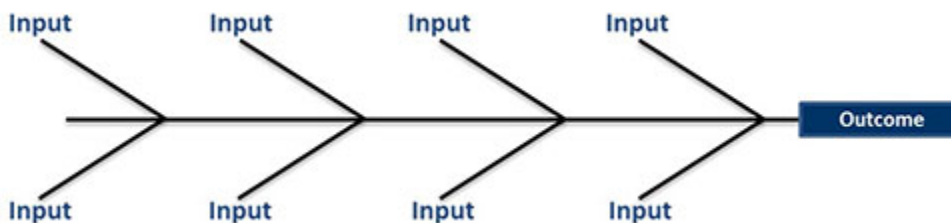


## Fishbone Diagram

This is a technique used to structure root cause identification during brainstorming sessions.

The 5 Whys/Why Staircase can be used to complement the analysis required to complete a Fishbone Diagram.

The visual layout helps the analyst to more easily recognize whether issues are closely related (sub-branches of the same main category), or whether these issues are instead of discrete factors.



- Step 1: Create an outcome statement. Write it at the center right of the whiteboard. Draw a box around it with a horizontal arrow running to it.
- Step 2: Identify the major categories of causes of the outcome. Examples of categories of causes may include the following:
  - Personnel, Material, Method, Measurements, Environment, Technology
  - Doctrine, Organization, Training, Materiel, Leadership, Personnel, Facilities and Policy
- Step 3: Write the categories of causes as branches from the main arrow.
- Step 4: Brainstorm all possible causes of the outcome. Ask “why did/does this happen?” As each idea is given, write it as a branch from the appropriate category (from Step 2).
- Step 5: Continue asking “why did/does this happen?” about each cause. Place the answers as sub-branches extending from the causes.
- Step 6: When you run out of ideas, focus attention to places on the chart where there are relatively few ideas.

## Step 3. Explore Alternatives

The third step in the decision-making process is to explore alternative solutions to the problem identified in Step 1. This step consists of two parts:

- Generating alternatives.
- Evaluating alternatives.

### Techniques for Generating Alternatives

Brainstorming can be done individually or in a group. Brainstorming requires an environment in which the participants (individuals or group members) are free to “think out loud.” Participants blurt out as many ideas as possible within a specified time period. No evaluation of ideas is permitted to encourage the free flow of creative ideas. These ideas are recorded. When the specified time period ends, then evaluation of the ideas begins.

Surveys economically tap the ideas of a large group of respondents. Surveys present respondents with the problem and a series of alternative solutions.

Discussion groups should consist of those who are directly involved in decision making. In generating alternatives, the group members should:

- Be comprehensive.
- Avoid initial judgments (as in brainstorming).
- Focus on the problem, not on the personalities of the people involved in the decision-making process. (But be sensitive to the impact of personalities on the process.)

### Criteria for Evaluating Alternatives

After you have generated alternative solutions, you must have some means of evaluating them. The job aid on the following page lists criteria by which you can evaluate alternatives.

Another part of evaluation is identifying contingencies—what could go wrong. Identify what could get in the way of solving the problem you are facing.

Criteria for Evaluating Alternatives Step	Questions To Ask
1. Identify Constraints	<p>Do any of the following factors serve as a limitation on this solution?</p> <ul style="list-style-type: none"><li>• Technical (limited equipment or technology)</li><li>• Political (legal restrictions or ordinances)</li><li>• Economic (cost or capital restrictions)</li><li>• Social (restrictions imposed by organized groups with special interests)</li><li>• Human resources (limited ability of relevant people to understand or initiate certain actions)</li><li>• Time (requirements that a solution be found within a prescribed time period, thereby eliminating consideration of long-range solutions)</li></ul>
2. Determine Appropriateness	Does this solution fit the circumstances?

Criteria for Evaluating Alternatives Step	Questions To Ask
3. Verify Adequacy	Will this option make enough of a difference to be worth doing?
4. Evaluate Effectiveness	Will this option meet the objective?
5. Evaluate Efficiency	What is the cost/benefit ratio of this option?
6. Determine Side Effects	What are the ramifications of this option?

## Step 4. Select an Alternative

The third step in the problem-solving model is to select one of the alternatives explored in Step 2 for implementation. Selecting an alternative is a critical step in the problem-solving process. After you have evaluated each alternative, one should stand out as coming closest to solving the problem with the most advantages and fewest disadvantages.

Implementing the solution may not be easy, however. There may be repercussions, and you should complete a “reality check” to identify and evaluate the possible consequences of implementing the solution. Carefully consider how the solution will be implemented before selecting an alternative.

When selecting an alternative, you will encounter factors that affect your decision making. These factors may include:

- Political factors.
- Safety factors.
- Financial factors.
- Environmental considerations.
- Ethical factors.

Not all of these factors may be readily recognizable. As you examine the situation and apply the problem-solving model, be alert for these potential limits on the solutions that you can implement.

## Step 5. Implement the Solution

The fourth step involves five subparts as detailed below.

**Develop an action plan.** Implementation requires a series of steps to:

- Articulate who has to do what, with what resources, by what time, and toward what goal.
- Identify who must know about the decision.

**Determine objectives.** Objectives are measurable targets that are:

- Used to monitor progress and establish priorities.
- Based on analysis of the situation and contingencies.

**Identify needed resources.** Resources include people, information (data), and things. Ask yourself:

- What resources do I need?

- Where will I get them?
- How long will it take?
- What can others offer?
- Are there any special requirements?

**Build a plan.** Your plan should state who:

- Will do what (and with whom)
- By when
- Where
- How

**Implement the plan.** Use the action plan to put the decision in place. Remember to communicate the plan to all parties involved!

### Action Planning Checklist

Use the following questions to help develop details needed to plan the decision implementation.

1. Will the decision be implemented as it stands?      Yes                  No
2. Will it have to be modified?
3. Does the decision fit the problem and conditions specified earlier?      Yes                  No
4. Is this decision still the best option?                  Yes                  No
5. What was the better option?
6. What are the side effects of this decision?
7. Who is responsible for taking action?

## Step 6. Evaluate the Situation

Evaluation involves two parts:

**Monitoring progress.** Ask:

- Has the situation changed?
- Are more (or fewer) resources required?
- Is a different alternative solution required?

Monitoring the success and results of a decision is an ongoing process that is critical to fine-tuning a course of action.

**Evaluating the results.** Determine if this solution fixed the root cause.

### Evaluation Checklist

Use the following checklist to help you evaluate the results of the decision.

1. How will you know if the proposed decision has worked?
2. Is it measurable?                      Yes                      No
3. How will you measure?
4. Does the decision and action plan make use of existing channels of communication to generate feedback?
5. Will the feedback test the effectiveness of the decision?                      Yes                      No
6. Will the feedback be sufficient to reflect changing circumstances and conditions that might cause the need to modify the plan?                      Yes                      No
7. Is the solution achieving its purpose?                      Yes                      No
8. Is timely information generated so that it can be supplied to operational, administrative, and policy units in the jurisdiction?                      Yes                      No