

***“No problem can be solved from the same level of consciousness that created it.”***

– Albert Einstein

## What is Root Cause Analysis?

- A common and structured approach to problem solving and process improvement.
- The use of detective-like investigation and critical thinking techniques and skills to identify the *actual* reason a problem occurs (the underlining root cause – not just the symptom) and develop countermeasures (potential solutions) using tools such as eight-step problem solving, five-why, 6M and Ishikawa (fishbone) diagrams.
- A key component of **A3 Problem Solving** and continuous improvement initiatives.

## Ask “why” at least five times, for example:

***“Why isn’t my car starting?”***

- **First “Why?”** - The battery is dead.
- **Second “Why?”** - The alternator is not functioning.
- **Third “Why?”** - The alternator belt has broken.
- **Fourth “Why?”** - The alternator belt was beyond its useful service life and not replaced.
- **Fifth “Why?” - The Root Cause-** The car was not maintained according to the recommended service schedule.
- **Sixth “Why?” (Optional)** - Replacement parts are not available because of the extreme age of the car.



## Getting the right people and attitudes in the room:

- Anyone with information about the problem should attend.
- Those closest to the problem (work area) know the facts and are best positioned to understand the potential solutions.
- Leaders should ask “Why did this happen? Why? Why? Why? Why?” versus “What needs to be done to fix it?”.
- To effectively solve any problem, we must understand the true **Root Cause(s)**.

## Where to start and when should Root Cause Analysis be done?

- Key: Swarm the problem immediately, while memories are fresh.
- Just like a detective (Sherlock Holmes), you need to preserve, gather and document all the evidence from the “crime scene” (where the problem occurred) immediately.

## How to conduct Root Cause Analysis:

1. Convene the Root Cause Analysis session right away.
2. Create a blame-free environment where all input is welcome.
3. Encourage everyone to participate – no dominant voice(s).
4. Use a flip chart. First, carefully define the problem. This is a critical step to get all on the same page.
5. Broker an open and honest discussion with the facilitator asking: “What happened?” and “What did you see?”
6. Pull reflections from each participant and encourage discussion around each.
7. Quickly move from a flip chart to the Ishikawa (fishbone) diagram and write essential points quickly while the discussion continues to flow. Fill up the diagram with thoughts of the group.
8. For every response ask “Why?” not “Who?”
9. **Remember:** Sometimes you need to go even deeper than the fifth why to find the root cause.

Pictured: Ishikawa (Fishbone Diagram)

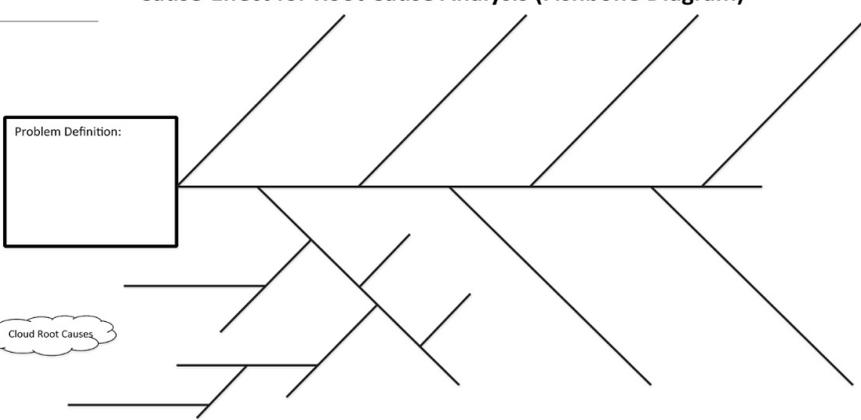
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### Cause-Effect for Root Cause Analysis (Fishbone Diagram)

**Steps to Follow:**

1. Define the problem
2. Describe the event
3. Show/define data and evidence from everyone involved
4. Brainstorm using Fishbone & 5-Why
5. Classify causes into Common Categories
6. Identify Cloud Root Causes which are at the heart of the problem
7. Identify countermeasures & corrective actions – test them, if possible
8. Implement them – Plan Do Check Adjust!



**Common Categories of Causes:**

- a. Materials (Stock, defective, wrong)
- b. Manpower (quantity, skill, motivation)
- c. Machine/Equipment (function, placement, maintenance, direction)
- d. Environment (weather, natural forces)
- e. Management (inattention, stress, lack of communication, lack of process)
- f. Methods (procedures, practices)
- g. Management System (training, management of risk/losses, involvement)

**List Countermeasures / Corrective Actions (Responsible Person/When Due):**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

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## Use Root Cause Analysis to develop Countermeasures (Possible Solutions):

- As potential causes of the problem begin to surface keep using the Ishikawa (fishbone) diagram to document and draw arrows connecting the causes and effects of the problem.
- Finding it hard to think? Use the 6M’s as a starting point.
  1. **Manpower** – Reduce the time and effort to complete the task.
  2. **Machines** – Increase time actually adding value by reducing stops, delays, breakdowns etc.
  3. **Methods** – Re-sequence the work (**Last Planner® System**).
  4. **Materials** – Ensure adequate inventory/information is at hand to complete the work.
  5. **Mother Nature** – Consider the environment and save costs not operating machines or equipment unnecessarily. Also consider location, including culture the work takes place in.
  6. **Measurement** - measure the proposed countermeasures to benchmark their effectiveness.

***“It’s not that I’m so smart, it’s just that I stay with problems longer.... One should look for what is, and not for what one thinks should be.” – Albert Einstein***

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