

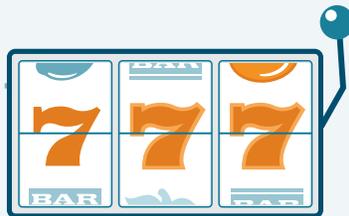
# WHAT IS APOLLO ROOT CAUSE ANALYSIS™ USED FOR?



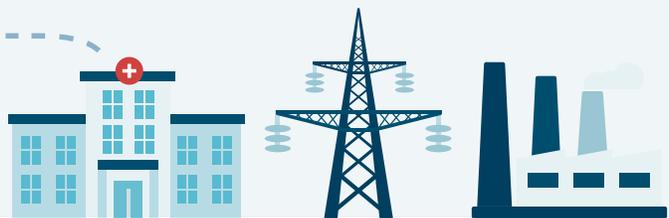
At some point, every company encounters problems that need solving, whether they are of a catastrophic nature like a massive oil spill, or of a more common nature, like turn-around times that are slower than you would like.



For those of us who lack a lucky rabbit's foot, we need an effective, efficient, and reliable method of resolving problems that have already occurred and preventing future problems.



(And if your operation has never encountered a problem, stop reading this immediately and head directly to Vegas because you've got some serious luck on your side!)



At ARMS Reliability, we are firm believers in Apollo Root Cause Analysis™ because we've seen it solve real-world problems for numerous clients all over the world, in industries including mining, transportation, aerospace, petro-chemical, utilities, manufacturing, telecommunications, and healthcare.

# WHAT EXACTLY IS APOLLO ROOT CAUSE ANALYSIS™?

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Traditional root cause analysis (RCA) proposes that if you retrace the chain of causes that led to a particular event, you will eventually find the single cause that set everything else in motion, known as the “root cause.” The theory is that finding and eliminating this single root cause will solve the problem.

But after years of investigative experience in the nuclear field, including analysis of the 1979 Three Mile Island Nuclear Power Plant partial meltdown, Dean L. Gano realized that traditional RCA methods weren't working.

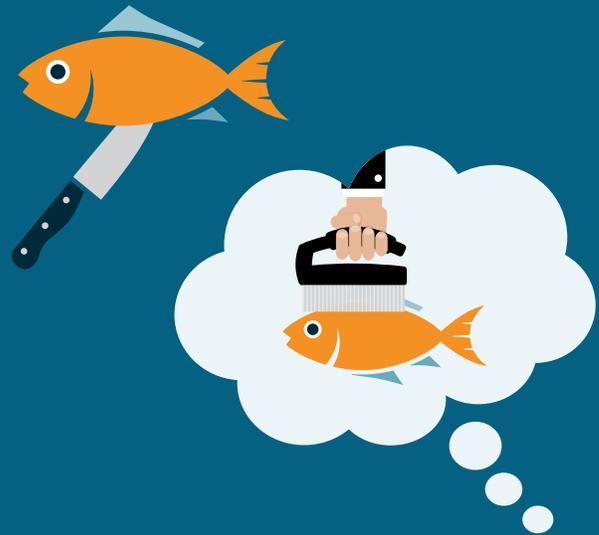


He noticed that the most popular methods of problem solving were people-centric and subjective rather than principle-based and objective. The “single root cause” is a myth that was preventing problems from truly getting solved.

The issue with human problem solving is that every one of us experiences the world from our own individual perspective—perspectives that are often contradictory, even when we are looking at or talking about the exact same thing.



For example, one of our instructors was using the process of cleaning a fish to illustrate something in a class. One of the students couldn't picture where a knife would come in to that process. She was unfamiliar with fishing terminology and didn't know that "cleaning" a fish meant gutting it and removing the innards. She had been picturing scrubbing a fish with a brush.

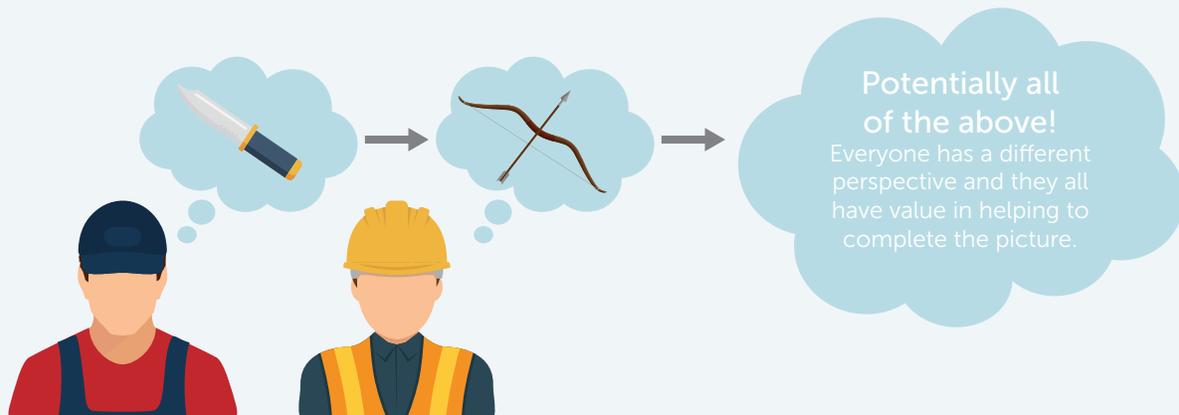


In order to get two people with completely different perspectives to look at an event and agree upon one conclusion, Gano realized we must create a reality that encompasses each individual's point of view. Creating a shared reality allows us to get buy-in from everyone. This is the goal of Apollo Root Cause Analysis™.

### Example

You live on the Panatobe Plain 5,000 years ago and your objective is to obtain food. Which of the following things would you use to do so?

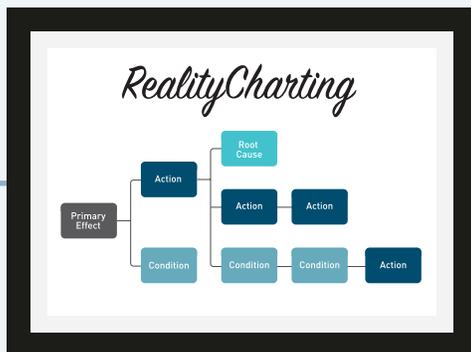
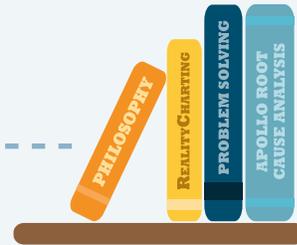
- Knife
- Map
- Bow and Arrow
- Map
- 7 Year Old Boy
- 85 Year Old Chief
- Shovel
- Patience
- Poison
- Water
- Animal Sounds



# WHAT IS REALITYCHARTING?



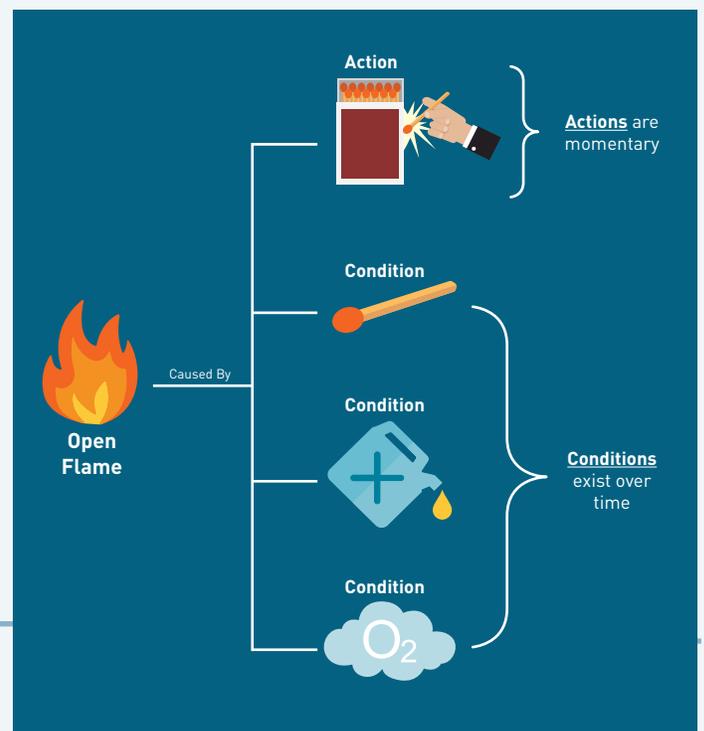
So far this might sound pretty philosophical, but the Apollo Root Cause Analysis™ method is actually very practical.



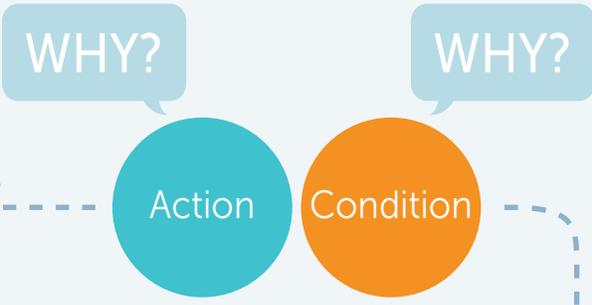
Where other methods of problem-solving are linear and subjective according to the point of view of the storyteller ("A" caused "B" and "B" caused "C"...), the Apollo Root Cause Analysis™ method utilizes a process called RealityCharting which encompasses all known causes as well as their relationships with each other, providing a more complete picture.

We create a RealityChart by defining a problem, asking why the problem occurred, and then ensuring that the answer includes both an action and a condition. Other forms of problem solving often focus only on the action-causes and ignore the condition-causes.

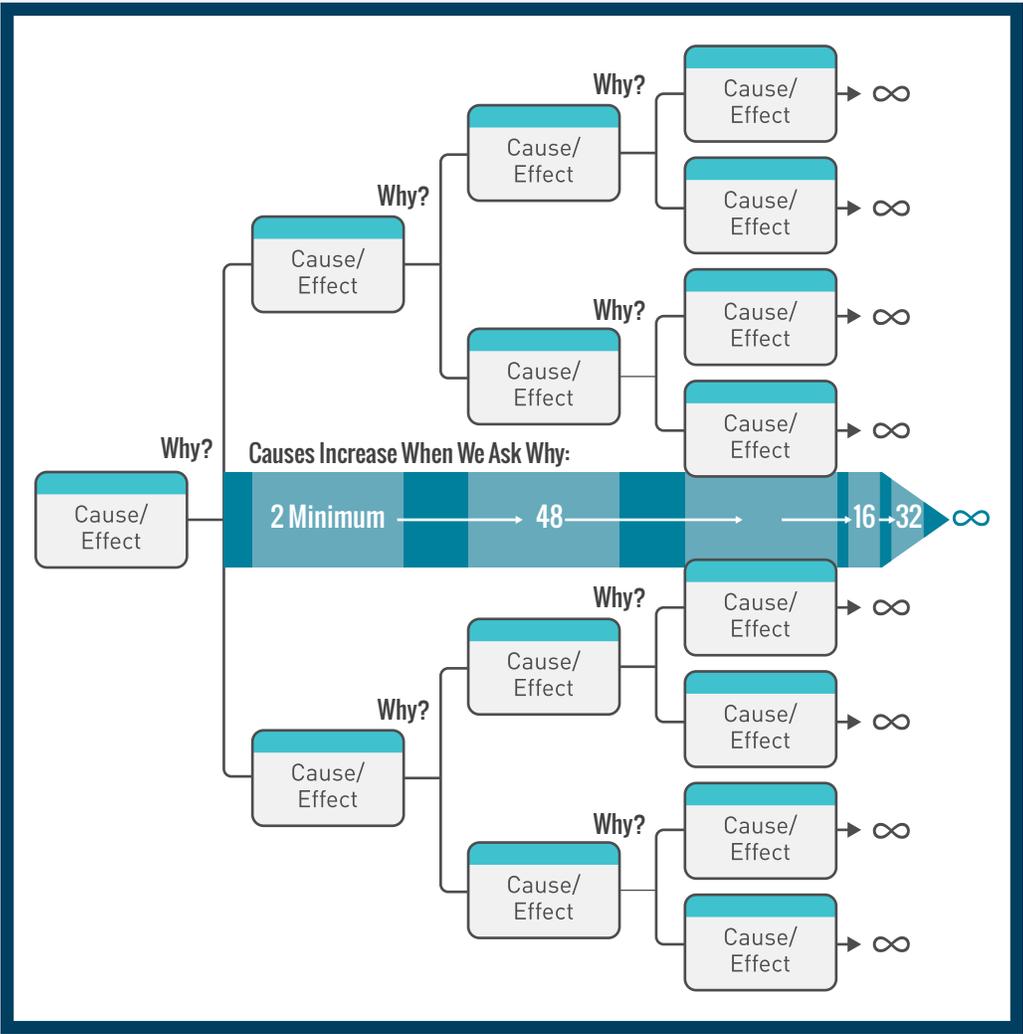
For instance, if you are looking at the problem of an open fire, the most obvious cause (action cause) would be a match strike. But the RealityChart would also require us to examine the conditional causes, such as the existence of the match, combustible material, and oxygen.



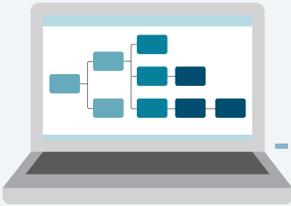
We then ask "why" of each action and condition, which means the set of causes grows exponentially. By hashing out all the causes, we are usually able to find better solutions.



This also allows all stakeholders to incorporate their point of view, so it's no longer the loudest voice in the room that's drawing the conclusions and defining the solutions.



# WHAT ARE THE BENEFITS OF APOLLO ROOT CAUSE ANALYSIS™ AND REALITYCHARTING?

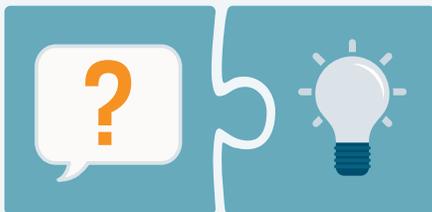


## Create a Common Reality

During an investigation using the Apollo Root Cause Analysis™ method, a RealityChart is produced showing all the known causes and their inter-relationships. Because all stakeholders can see these causal relationships in the RealityChart, buy-in of the solutions is readily attained. No longer is the best storyteller or the boss' opinion driving the investigation.

## Eliminate Recurring Problems

Individuals trained in the Apollo Root Cause Analysis™ method will be skilled in identifying solutions that are within the organization's control, prevent recurrence, and meet the organization's goals and objectives.

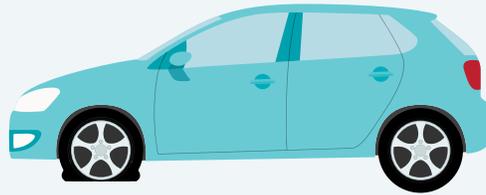


## Get a Definite Result - Know When the Problem is Solved

Using the Apollo Root Cause Analysis™ method for your investigation results in clear causal connections between your solutions and the defined problem so you can be confident the problem is being directly addressed and will be resolved effectively.

## Address Any Size Problem

The Apollo Root Cause Analysis™ method is scalable to any problem, large or small – whether it is a major mechanical issue or a flat car tire.



## Eliminate Assumptions

The evidence requirement for each cause ensures that there is no “story telling” involved, which means there is not room for assumptions and the ineffective attempts at resolution that often result because of them.



## Avoid Pointing Fingers

There is no “who” in the problem definition, which means blame is not being placed on particular people or areas of the business. The goal is to find solutions that prevent recurrence, not find a guilty party.



# HERE'S WHAT ACTUAL USERS OF THE APOLLO ROOT CAUSE ANALYSIS™ METHOD ARE SAYING...

"Shell E&P has adopted the Apollo RCA methodology world-wide as our core RCA methodology...The methodology is scalable. It can be used for any size and complexity of problem/failure investigation... The Apollo RCA methodology works and will lead you to problem resolution."

**Engineering Advisor - Shell E&P**



"I learned a lot about problem solving. I thought I knew how to problem solve but after experiencing a strategic process to follow, makes a night and day difference to how I now look at problems. I'm also more confident to take on the challenge of investigating any event; hopefully a simple one first though! Specifics and simplicity are my key take aways."

**Reliability Engineer - BHP Billiton**



"12 months on from attending an RCA course in Mackay, and I am pleased to report that the training provided has been invaluable to me in my role as Lead Commissioning Technician, I feel as though I look at "faults" in a more positive way, and I want to understand the cause and the chain of events that ultimately result in the problem I am dealing with. The software program is not only a very useful tool, it also allows us to present our information to the client in a clear and professional manner."

**Lead Commissioning Technician, Siemens Ltd**

