Recall that a problem is:

* A concern,
* That is in the present
* And the root cause needs to be found and removed for you to solve it (see attached graphic below or click on KT Simplified on “Problem Solving subdirectory)

Do not confuse problem solving with decision making or potential problem solving. The attached graphic shows the differences between problem solving, decision making and solving future problems. in a simplified format. (The KT graphic, PSDM, goes in much greater detail.)

**The 6 “Cs” …**

The first **C** is to **COLLECT** data.

Let’s say for example, you acquired new business and it appears you are facing a shortage of capacity and you begin to have a concern that your shutdown time may be excessive. That is --you have a present concern. So immediately you begin to gather all the data you have on plant shutdowns from the past. You create a database of shutdowns; listing durations and ostensible causes. Since you did not gather these data before, the ostensible causes are mostly from your recollection.

The second **C** is to **CLASSIFY** the data.

Next you want to categorize or stratify the data into logical groups. These groups usually correlate with how you might go about solving them. Of course, we want time and duration, as those affect our primary concern, which is lost capacity. But, in addition, we want to be able to focus on possible solutions, so some logical categories might be: mechanical breakdown, environmental issues such as weather or power outages; lack of materials and the list goes on. It is not uncommon, as you gather data, that new categories come to mind. And the important factor is that **you need clear operational definitions of the types of defects** for these classifications to have any meaning. I cannot stress enough the need for good operational definitions.

The third **C** is to **CORRELATE** the data.

In this step we are just looking at the mathematical relationships of the data and possible causes. Just because things correlate it does not mean they are logically connected. But correlations are easy to evaluate and often lead to causation. It is a good starting place to begin your problem-solving thinking. For example, in Detroit, if you correlate ice cream sales to crime, you will find a strong correlation. However, there is no causation, and even an ice cream sugar-high does not explain the relationship.

The fourth **C** is for **CAUSE AND EFFECT.**

Which is what many correlations will guide you to. There is a cause and effect when there is a correlation ***and*** that correlation can be explained by sound theory. The problem with the ice cream-crime correlation is that, as a cause effect relationship; there is no explanatory theory, not even a sugar high. However, in this case, both are connected to a third variable, the weather patterns. In Detroit, both crime and ice cream sales increase in the summertime.

The fifth **C** is to find the MOST CORRECT solution

There are three reasons for this step. First all problems are part of an interactive system with both synergistic and antagonistic responses. Hence you can correct one “problem” in a system and yet it will work to the detriment of the overall system response. For example, in a plant that wishes to reduce production costs; they target reductions in maintenance expenditures. Very often, this type of cost cutting looks very good, as immediately costs are reduced. However, if this effort then reduces overall plant reliability, you will later lose a great deal of overall costs are you try to cover the reliability issue with overtime, expediting and other reactive efforts. In this case, reducing maintenance costs are almost never “the most correct” solution to reducing overall costs. In fact, more often than not, it is precisely the opposite. Improve reliability and generally overall plant costs will drop; but this often requires an increase in maintenance costs. Second, because our (external)environment changes, all solutions are temporal in nature and both the long term and the short term benefits need to be taken into effect. Often the short term solution works to the detriment in the long term. Third, often there are political or other (internal) reasons that make some short term “bubble gum and bailing wire” fix expedient or even necessary. Normally these conditions change quickly and it is important to have “the most correct solution” within arm’s reach so it can be implemented when these circumstances change.

The sixth **C** is that there are **NO COINCIDENCES**

All too often when we cannot understand what the data are saying, we either

1. disregard the data or
2. dismiss it as “just a coincidence”.

Unless you have concrete evidence that the data are bad; more likely than not, by over 100:1 odds, the data are good. Rather than disregard the data, it is often instructive to ask yet another question. That is, “What set of circumstances would have to exist to create these data?”. Most often, the problem is that we just don’t understand the underlying problem and by asking and answering this question, often a great deal of clarity is attained.

Declaring this situation is a coincidence, while convenient and seemingly time saving … unfortunately takes you no closer to a solution. What I have found when “a coincidence” is used as the explanation for the observed phenomenon is that the problem will appear again and frequently at a worse time and a worse place. Seldom are problems cooperative enough -- to just stay in closet. When problem solvers revert to these types of explanations I find it very useful to get into the Kepner-Tregoe methodology and make extensive use of the problem specification to clarify this situation. (You can find examples of “problem solving and decision making” listed on the Problem Solving sub-directory)

