Being Right or Being Effective Can Make or Break Your Technical Career

By Steven Cerri

The engineers' calling

We engineers and scientists spend four to eight years or more in college learning that the world and the universe will indeed give up its secrets if we are but smart enough. We also find that when the universe gives up its secrets the answers usually aren't left up to interpretation. The universe doesn't give different answers depending on blood sugar levels, mood swings, or political positions or dispositions. The universe is constant, predictable, even if it is, at times, unforgiving.

The second law of thermodynamics, or a computer programming language, or Newtonian physics, are not ambiguous. They are not filled with uncertainties (not withstanding Heisenberg's Uncertainty Principle). As engineers and scientists there is a "correctness" to our work. Our questions have one answer and one answer only. And if at first there are several answers to one question, we merely change the question so that only one variable is under consideration and therefore, only one right answer can emerge. $F=ma$ and $E=IR$ don't vary if two variables are known; the third is uniquely defined.

This certainty allows us to predict the future. It allows us to place humans on the moon and in space. It allows us to predict the orbit of a spacecraft. It allows us to determine the size of beams and cables for a bridge. It allows us to develop circuits, chips, and cell phones. Our understanding of the laws of physics and of the universe

allows us to predict the outcomes of our creations. This "problem solving" process is the juice that motivates us through our careers. It's the juice that allows us to spend long hours studying and working, sometimes alone and sometimes with others.

This is proudly called the scientific method, or at times, the creative process. This is the process of scientific discovery and engineering development. We are most interested in being right and unambiguous and being able to predict with certainty, sometimes with life and death in the balance.

Managers have a different calling

On the other hand, we managers and leaders realize that when it comes to dealing with managing and leading people, there are often many ways to achieve a specific outcome. Managers never have "enough" information. Managers never have the confidence afforded by an equation like F=ma. Managers constantly function in a fuzzy zone where making the best approximation possible is the norm.

While engineers function with variables that have stability, managers function with variables called "people" and "circumstances". They are unpredictable, variable, and uncertain.

While engineers usually have one foot on the ground as they lift the other to step forward, managers often have both feet off the ground as they jump to the next location on the path to achievement of the outcome.

And while, for the engineer, the next step may be defined unambiguously, for the manager there are many directions in which to jump. Many possibilities regarding how to deal with a management situation and still achieve the desired outcome.

An Example

Lets take a look at a simple example of what I mean. Assume that you want to drive from New York City to San Francisco. And also assume that you want to do it using the smallest amount of gasoline. That's the one variable that you are concerned about; your fuel consumption. Not the cost of the fuel used but the volume of the fuel.

So the calculation for the engineer in you is fairly straight forward. You want to know the distances along various possible routes. You want to know the changes in elevations along the route. You want to understand the variation in fuel consumption as a function of speed, elevation, and incline of the road. There are many parameters you will want to take into account and with all these parameters as input variables and one locked outcome variable, you can uniquely determine the path that will consume the least amount of gasoline. Period. That's the engineer's point of view. The engineer looks at the problem and attempts to squeeze all the uncertainty out of the calculation to determine the one right answer.

Now here is what the manager in you has to deal with. The weather is going to be unpredictable. You just don't have any way to "calculate" or determine what the weather is going to be like along your route and therefore you don't know the atmospheric density and therefore, you can't predict your mileage per gallon of gasoline with any degree of certainty. There will definitely be variability of fuel consumption per mile based on the weather and atmospheric conditions.

You likewise can't predict the roadwork that will take place en route. There may be significant delays along the way that are completely out of your control.

Also, you can't predict what the traffic will be on the roads you might travel. Will the traffic move at a constant pace or will it vary? Should you stay on freeways or on highways, or take a few back roads?

In the end, with all the various uncertainties that cannot be quantified with certainty, you determine that there are four different routes that seem feasible. Within certain limits, they each could produce a minimum consumption of fuel, but there is no way to be certain which route will produce THE minimum.

The engineer in you has determined the least expensive route in relation to fuel consumed. The manager in you has evaluated that there are three additional routes that might provide a minimum fuel consumption and the true answer won't be known until your are actually on the trip; and once on the trip you may want to be flexible enough to change routes depending on weather, road conditions, and traffic.

So which route do you select? Almost any of the four will do. So pick… based on what?

This is how managers deal with a trip from New York City to San Francisco. How comfortable are you with the engineering approach versus the management approach? Since managers and leaders are often more interested in being effective they have to conclude that any of the four paths is effective. Within certain limits, all four routes will deliver minimum fuel consumption but which one will deliver the lowest is unknown. Any of the four will satisfy the manager's goal of being effective and arriving in San Francisco on "a minimum" amount of fuel. Regardless of which of the four paths is taken, the engineer in us will never know if the route taken was indeed the one that

would have produced the lowest fuel consumption compared to the others. The other three will never be taken and therefore, we will never know for sure.

The engineer and the scientist are focused on being right and looking for "the" answer. The manager and the leader are focused on being effective and having "an" answer that works. These are two different worlds. These are not only two different ways of acting, but they are two different ways of thinking and being.

Most engineers and scientists do not understand this as they embark on their transition to management. They are often doomed to management challenges and frustrations because they believe that, as managers, they must seek to be right; they must seek to find the right answer in a given management situation, while their managers primarily want them to be effective.

Asking different questions

There is one more important point that most engineers do not understand as they make their transition to management. The questions asked by the engineer versus the manager regarding the situation are very different. For the engineer the question is "How do I drive from New York City to San Francisco on the least amount of gasoline?"

For the manager the question is "How do I drive from New York City to San Francisco knowing what I know and not knowing a lot of other parameters, and still minimize my gasoline consumption with a high level of probability that is significantly less than 100%?"

Engineers who are new managers don't usually change their "questions" when they become managers. They ask the same questions in the same way when they are

managers as they did when they were engineers. They assume that the thinking that made them successful as engineers will make them successful as leads or managers. Big mistake.

The world of engineering is driven by an attempt to squeeze uncertainty and ambiguity out of a given situation. Management, on the other hand, accepts and embraces uncertainty and ambiguity in an attempt to achieve an outcome that can be arrived at through a number of different paths.

Engineers remove uncertainty as much as possible because that is what engineers do. Managers embrace this level of uncertainty and ambiguity because that is what managers do.

Which path can you walk with comfort?