**How You Define the Problem Determines Whether You Solve It**

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**Summary.**New innovations can seem like they come out of nowhere. How could so many people have missed the solution to the problem for so long? And how in the world did the first person come up with that solution at all? In fact, most people who come up with...more

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Typical stories of creativity and invention focus on finding novel ways to solve problems. James Dyson found a way to adapt the industrial cyclone to [eliminate the bag in a vacuum cleaner](https://www.inc.com/ilan-mochari/vacuum-innovation.html). Pablo Picasso and Georges Braque [developed cubism](http://www.theartstory.org/movement-cubism.htm) as a technique for including several views of a scene in the same painting. The desktop operating system developed at Xerox PARC [replaced computer commands](https://en.wikipedia.org/wiki/Xerox_Alto) with a spatial user interface.

These brief descriptions of these innovations all focus primarily on the novel solution. The problem they solve seems obvious.

But framing innovations in this way makes creativity seem like a mystery. How could so many people have missed the solution to the problem for so long? And how in the world did the first person come up with that solution at all?

In fact, most people who come up with creative solutions to problems rely on a relatively straightforward method: finding a solution inside the collective memory of the people working on the problem. That is, someone working to solve the problem knows something that will help them find a solution — they just haven’t realized yet that they know it.

Sure, some people stumble on the answer. When [Archimedes stepped into the bath](http://www.longlongtimeago.com/once-upon-a-time/great-discoveries/eureka-the-story-of-archimedes-and-the-golden-crown/) and noticed the water level rise, he lucked into the solution for finding the volume of an ornately decorated crown. And others invest decades and millions (or even billions) of dollars into research and development (see drug companies). But tapping into the individual’s or group’s memory is one of the most cost effective and repeatable problem-solving approaches.

The key to this method is to get the right information out of memory to solve the problem.

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Human memory is set up in a way that encountering a piece of information serves as a cue to retrieve other related things. If I ask you to imagine a birthday party, you can quickly retrieve information about birthday parties you have attended, and you will likely be able to think about party hats, cake, and singing “Happy Birthday.” You don’t have to expend much effort to recall this information; it emerges as a result of the initial cue.

If you want to retrieve something else from memory, you need to change the cue. If I now ask you to think about salad, you can likely call to mind information about lettuce, tomatoes, and dressing, even though you were thinking about birthday parties just a minute ago.

When doing creative problem solving, the statement of the problem is the cue to memory. That is what reaches in to memory and draws out related information.

In order to generate a variety of possible solutions to a problem, then, the problem solver (or group) can change the description of the problem in ways that lead new information to be drawn from memory.

For example, it is hard to see how Dyson would have gotten to industrial cyclones from thinking about vacuum cleaner bags. But an alternative way to describe the problem is that a vacuum takes in a combination of dirt and air and has to separate the dirt from the air. Bags do this by acting as a filter that traps the dirt and lets the air pass through pores in the bag. But there are many ways to separate particles from air. Industrial cyclones create a spinning mass of air that throws particles to the edges by centrifugal force.

This way of describing a vacuum is that it generalizes the problem by removing some of the specific components typically used to solve it. The phrase “separating dirt from air” does not mention the bag at all. When you focus on the bag, you’ll naturally be reminded of aspects of bags. The large list of patent numbers on most vacuum cleaner bags suggests that many inventors have done just that. A radically new solution to a problem, though, requires a new problem statement.

So how do you create the problem statement you need to find a solution to your business problem? Unfortunately, there is no ideal problem statement. Instead, the most consistently creative people and groups are ones that find many different ways to describe the problem being solved. Some of those statements will be specific and talk about the objects being acted on (e.g. vacuum bags). That leads to retrieval of specific information that is highly related to the problem (e.g. different types of vacuum bags). Then, groups should find several ways to describe the essence of the problem being solved in ways that focus on the relationships among the objects or a more abstract description of the goal (e.g. separate dirt from air). Each of these descriptions will help people to recall knowledge that is more distantly related to the domain in which the problem is stated.

Most of us have been looking in the wrong place for our creative insights. We ask people to “think outside the box,” but we should be asking people to find more descriptions of the box and see what that causes us to remember.