

The Art of Problem Solving

A small collection of thoughts on PS

By

PETER DE JAGER

pdejager@technobility.com

www.technobility.com

February 2010

Greetings,

In 2007 I started giving this presentation and workshop again after an absence of about 20 years from this topic. Why? Because a number of associations had had me in to speak to their organizations several times, and while they enjoyed my Change Management presentations they wanted to have me speak on something different.

If you've heard me speak, then it should come as no surprise to learn that I approach PS in my own unique and contrary style. I believe the only way to 'teach' problem solving is to have the audience solve problems – and then THINK about how they went about that task.

A 'handout' for these sessions always poses me a challenge. How do I convey the same sense of 'exploring' the topic that I bring to the presentations and workshops? I started by penning a more traditional outline of a PS methodology... and when finished I threw it out... it didn't meet the goals I'd set for myself. I wanted a more chaotic style to the handout, one that guaranteed I was approaching the topic from many angles. Sooo... I search through past articles for articles dealing with PS in different ways and then wrote a bit more to flesh out some of the bones of my thoughts.

So... here you go.

Enjoy.

As always... feed back is appreciated.

Peter de Jager

Brampton, Ont – Nov 2008

pdejager@technobility.com.

On the Art of Problem Solving

What do we mean when we state, “I have a problem!”? That’s one of those sneaky questions which we assume we know the answer to until we actually start answering it. Here are a couple of common responses:

- *When something is broken*
- *When something doesn’t work*
- *When things aren’t going the way I want them to*

With these in mind, consider the following situation:

You walk into someone’s office and they complain to you, “Something’s wrong with my PC, it isn’t working!” You look over and immediately notice that the computer isn’t plugged in.

Question for you... what’s the problem facing you? Is it...

- *The PC isn’t plugged in?*
- *The user didn’t notice the computer wasn’t plugged in?*
- *The user didn’t know enough to check to see if it was plugged in?*

That’s a pretty standard list, but we don’t have to stop there, we could continue...

Is the problem that;

- *PCs aren’t smart enough to plug **themselves** in?*
- *PCs **need** to be plugged in?*
- *Plugs are too easily unplugged?*
- *Power outlets are on the wall and not on the desk where we need them?*

Each of these problem statements leads to entirely differently solutions, ranging from merely bending down and replugging the computer into the wall socket to a product revolution which will make you the next Bill Gates.

So, back to the original question, what do we mean when we state “I have a problem!”? It doesn’t automatically mean something is ‘broken’; the unplugged PC above isn’t broken. There isn’t anything wrong with the PC. It’s obeying all the laws of physics. So... what’s going on? The explanation “*When things aren’t going the way I want them to*” is not so much “more accurate” as it is “more useful” than the notion that “something needs fixing”.

Gerald Weinberg and Donald Gause in their book “Are your lights on?” offer the following definition of a “Problem”:

*A problem exists,
when there is a difference between
What we perceive and
What we desire*

I've found this definition incredibly useful as the base foundation upon which to build a problem solving methodology. Notice, it makes no reference to the outside world, all the problems exist somewhere in the gap between desire and perception.

The simple example of the unplugged computer points to the first important step in problem solving. We must agree from the start what exactly it is we intend to work on. We must gain consensus on the problem definition before we do anything else.

To become more profitable... do we increase profit margins? Reduce costs? Or increase sales?

To 'fix' this machine, do we... learn how to fix the machine? Find the part that is preventing it from doing what we want it to? Stop the thing that's causing it to break in the first place? Find the right person and pay them to fix it? Replace it? Or change our way of doing things so we don't need to fix it?

Etc. etc. One of most common bits of advice in problem solving is, "Never latch onto the first solution you find!"... that's great advice. Equally great however is the advice, "Never latch onto the first *problem description* you come across!"

A good problem definition is almost, not always, equivalent to the problem's solution. The observation that the PC is unplugged screams at you to plug it in. While that solves the immediate problem, it leaves open the other problem of why wasn't the user able to figure that out for themselves?

This leads directly to a specific PS tip. Never, under any circumstances, *automatically* accept a problem definition from the person bringing the problem to your attention. The reason is simple enough, if they really knew what the problem was, then they wouldn't have a problem. That's not always true, but it's true often enough to help the self ordained problem solver avoid a lot of grief.

Next PS tip for the PS definition stage. When we're trying to get agreement on a PS definition we tend to ask questions which seek an affirmative answer. We do this for at least two reasons;

- 1) To demonstrate our understanding of the problem (ie. To look good/smart)
- 2) To get 'agreement' – after all, that's what we're seeking!

What is also useful, perhaps even more useful, is to ask questions which deliberately seek a negative response. Ie. No that's NOT what I meant!

Why would you do this? To erect concrete, firm boundaries on the problem definition. A firm "No!" is worth at least a dozen casual nods of affirmation. This is partly because people tend to 'agree easily', sometimes too easily. They nod their heads in agreement without really listening to what you were saying to them.

This technique is also useful for testing assumptions about a problem. If one of your goals is to "Think outside the Box" then one way of finding out where the walls of the box are, is by throwing yourself against your assumptions and taking note of where you get bruised and bounce back.

Since we've wandered into the topic of creativity by way of the "Think outside the box" path, it's worthwhile spending a little bit of time pulling down a creativity myth.

Being creative is not about striving to think differently, it's much more about listening to yourself and paying attention to the little voices in your head --- Okay, that obviously needs some explanation.

In one of my workshops I give a specific task to the audience. As they're working on the assignment I wander around the room and listen in on their conversations and mumbling. One of the phrases I hear very often is, "This is just like 'tic-tac-toe'!" Once the exercise is over, I ask for the solutions. Typically nobody has solved the problem. I ask them if they compared the exercise to 'tic-tac-toe'? Most of them respond yes! I ask them if they attempted to use that information? None of them respond yes.

Basically, when they noticed the similarity to 'tic-tac-toe', and even voiced it out aloud, it was their brain screaming for attention and being ignored. Once I tell them to USE the knowledge, they quickly solve the problem.

Lesson? When you notice a 'pattern'/'similarity'/'metaphor' use it!

What's a pattern?

When you see a problem for the first time?

That's an incident... solve the problem. Move on.

When you see a problem for the second time?

That's a coincidence... solve the problem. Make a note of it, move on.

When you see a problem for the thirds time?

That's a pattern.... Solve the problem.

Then find the source of the problem and solve THAT problem. Move on.

Another example of the art of just letting creativity 'happen'? All of us have something in common. All day long we strive to be creative, and often we fail... yet when we go home, relax, and sleep – we dream the most fantastic things. When we're trying least, our creativity is unleashed. The challenge is to remove all the inhibitors to creative thought during the day and allow our minds to see patterns and new connections. Creativity is natural, something we don't have to 'work at', we just have to pay attention to our thoughts while problem solving.

Where are we so far? We've spoken about what problems are, a bit about problem definitions, and touched on creativity. Now it's time to get to some hard nosed technical stuff. Specifically 'What do you know about the problem/situation', more precisely, "Data Collection".

Once you've agreed on the problem definition, the next step is to focus on "what do you know?" This can get a little bit confusing, as there is a fuzzy boundary between 'data collection' and 'data analysis'. Or at least fuzzy in the sense that a lot of the time I can't see a boundary.

The best way is to talk about this phase of problem solving... is to solve a problem. So here's a simple one.

Arrange the nine numbers from 1-9 into a 3x3 grid, such that each row of 3 numbers, each column of 3 numbers, and each diagonal of 3 numbers all add up to the same number.

(p.s. I know that not everyone 'likes' math problems, but they often serve as the best puzzles to work with because they are well defined. Even if you hate these puzzles, play along, you might learn something.)

One way to determine "what do we know" is to restate the problem in a slightly different manner. In real life we'd be able to ask the problem giver if our new 'representation' is accurate, in this case we'll have to use our own judgment.

Here's another way of posing the problem:

In the diagram below, the letters A-I represent the numbers 1-9.
We need to identify the numerical values of A-I

[A]	[B]	[C]			
[D]	[E]	[F]			
[G]	[H]	[I]			

And...	Rows	$A+B+C=X$	Diagonals	$A+E+I=X$	Columns	$A+D+G=X$
		$D+E+F=X$		$G+E+C=X$		$B+E+H=X$
		$G+H+I=X$				$C+F+I=X$

So far, all we've done is restate the problem. Now we start the data gathering process.... "What do we know?"

We know that the numbers 1-9 total to 45... (Simple arithmetic)

We now that each of the three triplets (A,B,C), (D,E,F), (G,H,I) total to the same number... X... therefore $3X=45$... $X=15$

Question? (Here's that fuzzy line) is $X=15$ 'data collection' or 'data analysis'? Does it matter?

Next step? We're looking for numerical triplets that add up to 15. How many exist? We need at least eight triplets. What are they?

- $1+5+9 = 15$ ← our first possible triplet.**
- $1+6+8 = 15$ ← our 2nd possible triplet.**
- $2+4+9 = 15$ ← our 3rd possible triplet**
- $2+5+8 = 15$ ← our 4th possible triplet**
- $2+6+7 = 15$ ← our 6th possible triplet**
- $3+4+8 = 15$ ← our 5th possible triplet**
- $3+5+7 = 15$ ← our 7th possible triplet**
- $4+5+6 = 15$ ← our 8th possible triplet**

I'll leave it as an 'exercise for the reader' to prove/demonstrate that I've covered all the possible triplets. *Remember, no duplicate digits are allowed in the triplet, and the triplet must sum to 15. That means that (5,5,5) isn't allowed... and there is no triplet that contains a 9 and a 6...*

Our task is NOW to place these 8 triplets into the diagram below. (notice how problems naturally break into 'pieces'... Question? When you put a jigsaw puzzle together... what are the 'steps'? What do you always do first? What do you do next? And then?)

[A] [B] [C]
[D] [E] [F]
[G] [H] [I]

Is there 'more' information available to us?

Look at the corners A,C,G and I... they are each part of three triplets: a row, a column, and a diagonal.

The center (E) is part of four triplets: a row, a column and BOTH diagonals...

And the 'center sides' D,B,F,H are part of only two triplets... A column and a row.

Question... is there a number (represented by E) which is contained in 4 of the triplets we found??? (a row, a column and the two diagonals) There's ONLY one number that meets this condition. The number 5! So we have this... E=5

[A] [B] [C]
[D] [5] [F]
[G] [H] [I]

The next step? What are the two triplets that contain the number 5 and contain the 'center sides (B&H) and (D&F)? ie? D & F and B & H must each be only a part of 2 triplets.

The triplets (3,5,7) & (1,5,9) meet these conditions... so we have...

[A] [1] [C]
[3] [5] [7]
[G] [9] [I]

Now look at the letter 'A'... Are there three triplets (A,1,C), (A,3,G) and (A,5,I) that allow us to complete the puzzle?

Here are the triplets that meet that condition(8,1,6), (8,5,2), (8,3,4)--- giving us...

[8][1][6] [3][5][7] [4][9][2]

Viola... (Challenge to the reader... can you think of at least one OTHER approach to solving this problem?)

This might all seem tedious... and it is. The data collection part of PS is ‘grunt work’, there’s nothing very exciting about the collection and categorization of information. In the world outside math problems this data collection is less precise, more ambiguous... What does the client really want? What are the real deadlines, resources, compromises, constraints? What are the agendas of all the interested parties? Who wants the project to succeed? Who wants it to fail? Why? All of this is important information. It represents the ‘data’ of real world problems.

The data analysis part is also tedious; a bit more intellectually stimulating, but still tedious. What does this *bit* of information mean? How does it affect the rest of the problem? What are the consequences if we do ‘this’ rather than ‘that’?

Unlike math problems like the one above, not all problems solve ‘themselves’ just by doing the methodical data collection and analysis. A Sudoku problem always falls to the onslaught of the question ‘what do we know?’ and the application of simple rules of logic. In the real world, what’s required is a spark of insight, the moment when all of a sudden we ‘see’ what needs to be done.

How do we get that spark to happen? The truth is, we don’t know. You can give two people the exact same information, the same training, the same experience and one is stumped by the problem and the other person goes ‘Aha!’ as they connect the dots and arrive at the solution.

While there is no way to train someone to find that ‘Aha!’ moment, we can do a lot to make it more likely that we stumble upon it. I’ve collected a few ideas and labeled them ‘Personal’, ‘Unconscious’ and ‘Mechanical’. The intent is to provide some tools that place the spark of “Aha!” under your feet more often as you stumble towards an answer to whatever problem facing you.

Unconscious tools: intended to get you to pay attention to your unconscious.

- 1) **Don't push too hard:-** if you've been working for a long time on a problem with no success, then take a break. Do something totally unrelated to the problem. Let your unconscious mind work on it for a while. Watch a movie, read a book, go for a walk, a run or a swim.
- 2) **Listen to the voices within:-** If you've been noticing something familiar about the problem, then focus on that for while. What's this problem 'like'? How is it different from other problems you've worked on? How is it similar? Can you make it more similar? Less similar? How? Why not?
- 3) **Learn to watch yourself:-** This isn't easy, but it's worth practicing. As you solve the problem, what approaches are you always taking? Why? Is it because of habit? Or because you have a reason to approach a problem that way? Can you consciously change your approach?
- 4) **Write a description of the problem:-** Don't JUST think about the problem. Write it down. Diagram it. Write down what you think the problem is, what you think the problem solution would look like. Write down what you know for certain, what you think you know, what you're assuming. Challenge each point you make. Are you certain you know 'X' is true? How do you know that? How could you be wrong?
- 5) **The Janitor effect:-** Find someone who knows nothing about your problem. More importantly, find someone who could not possibly solve the problem because they literally don't know enough about the subject matter... now... explain the problem to them so that they CAN understand it. By forcing yourself to restate the problem in terms they'll understand, you'll force yourself to think differently about the problem.

Personal Tools: Intended to continually sharpen the saw.

- 1) **Power time:-** When are you most creative? The most suited to the grind of admin work? When are you best at thinking and best at documenting? Most of us have certain times of the day (or night) when we're better at different tasks. We can't do much to change those times, we can take note of them and use to our advantage. I don't write articles in the afternoon, nor do I waste my creative time in the early morning by doing accounting. I allocate different tasks to different times of the day. Creative tasks when my creative juices are flowing and admin task for when I'm operating on automatic, with not a creative spark in my head. (My accountant and Revenue Canada thank me for this.)
- 2) **Teams or Solitude:-** Do you work better on a team or by yourself? There's no blame attached to a personal preference, it's just a good idea to know where we shine. If Jim is most creative working by himself in the corner, then it makes little sense to insist that he always work in a team.
- 3) **Read Everything:-** Problem solving is mostly about connecting unconnected bits of information. The more information you have at your disposal, the better. You can't become a good problem solver in any field if you don't know the terrain. Reading is the #1 way to gather info because you can do it anywhere, anytime. Almost a mundane reminder, but the most powerful tool at your disposal. Read everything. *And don't just read within your field... read everything!*
- 4) **Is credit important to you?** :- One of the most important questions a Problem Solver needs to ask themselves... *Do I want to solve the problem... Or do I want to get credit for solving the problem?* The fact is, we can solve far more problems, far more difficult problems, if we don't care who gets the credit. It's a question we all have to ask ourselves each time to face a problem. It is far more difficult to get credit AND solve the problem than it is just to solve the problem. I'd recommend anyone take a day to themselves and ask this question relative to the largest problem they face... or they'd like to get solved.
- 5) **Get into the Zone:-** True problem solving takes focused thought. Interruptions, phone calls, (cat coughing up a hairball – sigh), people dropping by, background noise... all reduce our ability to think deeply about a problem. When problem solving, stop the interruptions to the best of your ability (relax the cat is still breathing). Switch off the phone, hang up the do not disturb sign, go missing from action, (throw the cat (*gently*) into the backyard).

Some Mechanicals:- intended to force structure on the Problem solving process.

- 1) **Don't resist forces, use them:-** Put simply, the thing most preventing you from solving a problem is likely the best thing to use to solve the problem. This is more than the cliché of turning lemons in lemonade; it's a way of looking at problems that more often than not leads to elegant solutions. Examples are all around us.
 - a. Bridges use gravity to hold everything together despite gravity's 'desire' to pull everything down.
 - b. Politics regularly uses people's self interests to get them to do what they wouldn't normally do.
 - c. 'Heat sinks' in computers use the heat of the computer to create airflows which cool the machine.
 - d. 'Pressure valves' use excess steam pressure to vent excess steam pressure.Your starting point? List the forces relevant to the problem. You can't start manipulating these until you know what they are. Making a list is the first step.

2) **Lists and Frameworks: #1 PESTLE**

PESTLE is nothing more than a mnemonic to remember possible 'aspects' affecting your problem/solution:

- Political
- Environmental
- Societal
- Technological
- Legal
- Economic

When look at a problem, how do the above areas of influence affect both the problem and your proposed solution? Perhaps more importantly? How will your solution affect these areas?

3) **Lists and frameworks: #2 SWOT analysis**

Take each point in the PESTLE analysis and go the next step; using the Strengths, Weaknesses, Opportunities and Threats what additional insight can you gain about the situation?

Item from Pestle	Strengths	Weaknesses
Opportunity		
Threat		

4) **Running the Alphabet: (take 1)**

This might seem silly (so what?) but it's a fairly effectively way of forcing you to think differently about your problem. Just make a list, A through Z and find something starting with that letter that relates to the problem either as a threat or opportunity. Use this when you're stumped for ideas. It can't hurt.

5) **Running the Alphabet: (take 2)** (solution to a tiny, but common problem)

Ever forget a word? You have it on the tip of your tongue but can't 'find' it? Run through the alphabet slowly in your mind, pay attention to the 'echoes', does the letter 'remind' you of the word? You'll find that you'll know for certain that the

word doesn't begin with 'S' or 'P', others will raise a question in your mind. (as you get older, you'll be using this more often... trust me)

6) Time Management:

Here's a fact... you have a finite amount of time allocated to you.

Here's another fact... there are an infinite number of problems to solve.

Hence an observation... you can't solve them all... so how will you decide which ones to solve and which to ignore?

You're going to start with the ever present 'to do' list. (it exists even if you've been too lazy to write it down.)

At the top of the list there are the things you must do!

Next? The things you'll do if you get the first section done.

Then, there's a list of things you won't do/shouldn't do/must stop doing.

Remember Pareto's Law: 80 % of your result is generated by 20% of your activities.

Learn one simple word. NO!

Use it when people expect you to do more than you have resources accomplish.

Remember? You *can't* do everything, so you have to *decide* what to do.

Yes... this is old news. Yes it's mundane. Yes it requires discipline. So?

7) One last thought?

Change one thing at a time. If you don't, you won't know which change caused the final result.

Summary

This smorgasbord of ideas is not offered as a complete overview of problem solving. It was intended as a sampling of ideas, reasonably related to each other, presented to an audience of people with vastly different problem solving abilities and experience. My goal? Somewhere in the presentation is an idea new to each listener, something they can take back and use to good effect on their next, or their current problem.

I invite you to visit the publication section of www.technobility.com and read the 100s of articles I've made available to you. Feel free to contact me with feedback, comments or anything else that comes to mind. You can reach me at the address below.

© 2006, Peter de Jager – Peter is a keynote speaker/writer/consultant focused on issues relating to Managing People and Project. He has a passion for the Change Management Challenge. You can contact him for bookings at pdejager@technobility.com

Hunting Gorillas in the Corridors

At great length, and in excruciating detail, a manager described a problem she was having with one of her employees. She ended her sad story with a plea for help, “*Short of confronting her, how do I fix the problem?*”

When the issue is boiled down to the barest essence, the real problem is made crystal clear; the manager is either incapable, or unwilling to solve her real problem - a deep seated fear of confrontation. Like a plumber with a leaky pipe and a strong case of aquaphobia, she wants to sneak around the problem and solve it without doing the one thing she must do, address it head on.

We all have this fear of ‘confrontation’ to varying degrees. Our dinner partner has a piece of salad stuck in their teeth? What do we do? Even if we do the right thing and inform them they have some greenery in their shiny whites, we do it carefully and delicately because we’re conscious of the possibility of giving offence. We don’t yell out while pointing excitedly to the offending brussel sprout, “Yuck! Your teeth are growing things!”

The irony of the situation is blatant. All of us, without exception, would rather know of a problem immediately, than be allowed by others to walk around looking ‘peculiar’ all day. If my zipper is unzipped? Tell me! Preferably before I’m standing in front of 500 people giving a speech.

Likewise, if I work for you and my performance is lacking in some manner? Tell me! Don’t wait until things have gotten so bad that you have to fire me.

This aversion to confronting problems only leads to larger problems. How can it not? Problems don’t solve themselves. Left on their own they get larger and more entrenched until they become a herd of 600lb purple polka dotted Gorillas everyone knows about, everyone steps around, and nobody is willing to even recognize, never mind attempt to shoo away.

Recently after a workshop one of the attendees came up to me and asked for advice on how to fire someone – tomorrow. My first question was whether or not the person in question was going to be surprised by this unfortunate turn of events. The answer, sadly, was typical of these situations, “She shouldn’t be. She knows things haven’t been going well.”

When pressed for more clarification on what exactly the employee knew, it turns out that the employee would indeed be surprised. It turned out that even though the problem was two years old, management had never laid out specific objectives, timelines and consequences. Result? A problem lasts for two years and an employee gets fired just before Christmas. Peace on Earth, goodwill to all men. Sigh.

In medieval times large organizations (known as Kingdoms), had a solution to this problem of not being willing to confront real issues. They hired out of work management consultants and gave them the position of Court Jester. The Court Jester’s job was simple enough. If the King had spinach in his teeth, or if his sword was rusty, then the Jester

pointed this out. (In a humorous way of course.) The Jester could do this with almost certain impunity as the King recognized the necessity of having problems made visible.

The ability to confront problems is attainable in any organization. It's a simple three step process. (Forget the Court Jesters they wear funny looking hats)

- 1) Recognize that the only way to solve a problem is to address it. This should be obvious, but obviously isn't.
- 2) Acquire the skill to address a problem objectively, without making it personal. If that's the organizational stumbling block... "Being objective instead of personal" then pay attention and re-read step one.
- 3) Confront the problem.

Did you notice the annoying self referencing paradox in all of this? The ugliest 600lb purple polka dotted Gorilla in most organizations is "the pervasive unwillingness to confront problems." Recognize THAT specific Gorilla and all the other ones will go away.

© 2008, Peter de Jager – Peter is a speaker focused on Change. He doesn't rely on other people to point out a problem. He checks his own zipper. Visit him at www.technobility.com

So? What do you Know?

There's no way to really talk about problem solving, or how it applies to our daily activities, without actually solving some problems. So, to get us started, here's a simple puzzle.

Fact #1: A Man has two Cats.

Fact #2: At least one of the Cats is Male.

Question: What is the probability that both of the Cats are Male?

To get the most out of this little exercise, try solving it before reading any further. I'll just wait patiently until you're ready to proceed.

Ok? You ready? Good.

The most common mistake is to think along these lines. Well, one cat is male, there are two other options available, Male or Female, therefore the probability is 1:2.

Wrong.

Without getting into the correct answer yet, let's talk about this approach. It seems right. It seems to take all the facts into account, but it doesn't. It's got the 'two cats' part correct, but the 'At least one of the Cats is Male' is almost... but not quite, being ignored.

And this is where things get interesting. Problem Solving, whether we're talking about a trivial puzzle like this, or working with a client to deliver a need, requires two things from us.

- 1) A precise understanding of what we know, and
- 2) The ability to properly understand what the other person is trying to communicate.

In the above puzzle, the first fact is simple. The man has two cats. Not one, not three, not zero, but TWO (2) Cats.

The next fact is a little (a lot?) more complicated. It sounds simple enough. When we combine it with the first fact we get this... At least ONE of the TWO Cats in his possession is Male.

In the first, wrong attempt, we're doing something very subtle... We make the statement, "Well, one cat is Male..." and then examine the possibilities leading from that starting point.

Fair enough... but what about the other possibility? What possibility? The possibility that the Cat we're looking at is Female?

At this point, there is often confusion, disagreement and a general wailing and gnashing of teeth. The objection is we don't have to consider that possibility... it's covered by the possibility that the other Cat is Female in our first attempt at analysis.

This confusion arises out of a disagreement as to what "At least one of the two cats is male" really means.

Here's one way to see what's going wrong.

Grab one of his cats by the scruff of the neck. Pretend THIS cat is the MALE cat, what could the other cat be? Either Male or Female. That's two possibilities.

Now, it's ALSO possible that the cat you've grabbed isn't the MALE cat... remember, we don't know which one is male, all we know is that at least one of them is male. So, if it's not male, then it's female – meaning that the other cat must be the MALE... it can't be FEMALE since we know that at least one of the cats is MALE. Therefore the cat in our hand is FEMALE and the other Cat is MALE.... That's a third possibility. (and repetition helps)

Out of those three possibilities, how many were MALE/MALE? Only one, therefore the probability is that they're both Male is 1:3 and not 1:2.

Ironically, problem solving has less to do with problem *solving* than it does with problem *definition*. And problem definition is mostly about agreeing on what the problem is, before we head off in ten directions trying to solve it.

For any project manager, our starting point are the project specifications/requirements, which includes not just a description of what we must do, but also a description of what resources we have at our disposal. If the two simple facts given above, can cause confusion as to what the problem is, how certain are we that we understand what the user means when they hand us a set of specs? How much time do we spend testing our understanding of the specs? Do we make a concentrated effort to find problems with the specs? Do we understand the value of finding a problem at this stage, rather than after two years of development?

Here's a problem solving technique worth it's weight in scars, assume that your understanding of the problem/project is incorrect from the start. Now, how are you going to correct your understanding?

© 2008, Peter de Jager – Peter is a Keynote Speaker, Writer and Consultant. Read more of his work at www.technobility.com and contact him at pdejager@technobility.com

Cells Phones, Delegation and Succession Planning

Solutions to pressing problems are nearly always a double edged sword. Regardless of the problem solved, the solution inevitably creates a new problem to replace the old. The new challenge is often more difficult to eradicate because it is subtler and often less noticeable in the short term.

In 1935, Australia imported Cane Toads in an attempt to control Frenchi and Greyback beetles which were attacking sugarcane crops. The Toad solution had limited success, and in exchange for their enforced deportation, *a common Australian theme*, the Cane Toads found a country free of natural predators. The result is a growing plague of Cane Toads sweeping across Australia.

By itself, a plague of toads is not unlike Australia's plague of Rabbits, except that Cane Toads exude a poisonous venom. Generated by glands their backs, it is toxic enough to kill a variety of indigenous animals including dingos (native dogs), quolls (cat-sized marsupials), goannas (Australian monitor lizards), and crocodiles.

An attempt in 1990 to control this new pest with a Venezuelan virus, was aborted when it was found to also kill native frog species. As of this writing, the Cane Toads are winning.

For a more technological example of a solution generating a problem we need only open our email in the morning. Email is a great idea; allowing us to communicate faster and more cheaply than the traditional physical, paper, handwritten letter. Unfortunately for us, imbedded deep within that solution is the problem of ever increasing spam.

Given the cost of email, and factoring in our ability to seek out cheap solutions to problems, spam is an inevitable marketing strategy. As inevitable as a plague of poisonous toads in a land without a large enough number of sufficiently immune predators.

“So what has any of this to do with cell phones and succession planning?” you mumble impatiently to yourself as you sip your morning brew.

Cell Phones are a technological solution to situations we tend to perceive as problems. They make it possible to contact someone whenever the need arises. The package didn't arrive? Call the boss and find out what to do! The client is upset? Call the boss! The machine is broken? Call the Boss!

The cell phone is the best 'decision avoidance' device on the market. To compound the problem, it directly and very effectively reinforces the ego of managers who believe they're indispensable. Their way of managing is to hoard the entire decision making process. Staff aren't allowed to make decisions if the boss is available to provide guidance, and thanks to technology, the boss is now available 24/7!

This issue crystallized for me during a recent training session on the art of delegation. In a period of about three hours, each of 15 students (first level managers) left the session to answer 'urgent' calls from the office. Never one to let the perfect learning moment go

untapped, and having built a strong rapport with the attendees, I persuaded them to use these interruptions as an opportunity to learn something.

As we examined the reasons for the 15 different calls, we came to the surprising (?) conclusion that none of them warranted the interruption of a training session. The only one which challenged us a bit was the need for the manager to supply a password to a computer system. Which led to the question, if it was needed by staff, and if it was okay to obtain it over the phone, then why did they not already know it?

Yet, even though we all agreed that the interruptions were unnecessary, I was unable to convince them to turn off all the cell phones. The reason given was “But what if they need me?!”

This is of course the reason why succession planning is so important to organizational success. We cannot allow the successful operation of our organization to be hostage to the skills, knowledge, physical presence or accessibility of individuals.

If we cannot go offsite for a day or two without turning off the cell phone, then we’ve not empowered our staff to think. If, when we go on holiday, we’re constantly calling into the office, then we’ve failed to create an infrastructure which can survive without our input.

The problem we face is that the cell phone capitalizes on human frailty. It is far easier to be accessible via cell phone than to train our staff to think on their own. It is far easier to be accessible than to practice the difficult art of delegation. That this natural tendency to choose the easy path, inevitably handicaps the training of our replacement, is something we’d rather ignore. That’s a long term negative consequence which we all too willing to discount in the face of short term gains.

In short? To gain the ability to make decisions, we must make decisions - not phone calls. By turning off our cell phones, we’re not only giving ourselves a break from the office, we’re training our staff to be self reliant, and we’re training them to be future managers.

© 2008 Peter de Jager – Peter is a Change Management speaker and consultant focused on how we assimilate change and how change affects our organizations. Contact him at www.technobility.com

Problem Solving Bibliography

This list is not intended to be a complete list of PS books, it's merely a handful of books I've found very useful as I've tried to understand the art of problem solving.

Are your lights on? – Gerald Weinberg & Donald Gause – Dorset house

Possibly the most useful book on real life problem solving I've ever read.

The Visual Display of Quantitative Information – Edward Tufte - Graphics Press

A large part of Problem Solving revolves around the concept of 'Reframing'

The visual display of a problem is inevitably a reframing of the problem.

Tufte's book is the definitive work in this area. It transcends most other academic works by becoming a work of art in and of itself.

40 Principles (TRIZ) – Genrich Altshuller – Technical Innovation Center (Worcester, MA)

TRIZ is a large body of work relating to both PS and Innovation. It is the 'new' thing on the horizon for Problem Solvers seeking a PS methodology.

How to Solve it – George Polya - Princeton University Press

If there is a definitive pure PS book, then this is it. While it definitely has a mathematical focus, the concepts are applicable to all types of PS.

Edward de Bono's work – Edward de Bono – (Various Publishers)

A PS library without at least a few of de Bono's books can only rank as 'deficient'. Regardless of anyone's view of de Bono's approach, his books consistently introduce new ideas/terms into the language of PS.

Godel, Escher & Bach – Douglas Hofstadter – Basic Books

This is NOT a book on Problem Solving, it is instead a book for anyone who embraces the thinking involved in Problem Solving as pleasurable.

The Art of Creative Thinking – Gerard Nierenberg – A Fireside Book

A broad overview of creativity concepts, practices and applications.

The Professional Decision Maker – Ben Heirs – Dodd Mead

'Thinking' for the professional manager.

Styles of Thinking – Allen Harrison & Robert Bramson – Anchor Press Doubleday

If you enjoyed the above volume, then this is a good companion to it.

Any and all games/puzzle magazines/books

If, as you solve any puzzle, you can train yourself to 'listen' to your thinking then you have the potential for learning far more about PS than any of the above books can teach you.

This collection of references was compiled by Peter de Jager –

Pdejager@technobility.com you can read more of his work at www.technobility.com

A Proposal for a Workshop/Presentation on the Art of PS

THE WS OF PROBLEM SOLVING

Who Cares?	Lower to Middle and Upper Management and everyone reporting to them.
What Exactly?	Defining – not only ‘problems’ but also ‘problem solving’ as an activity.
Who Owns?	Knowing who owns a problem is one key to solving it.
Who Wins?	Who wins if the problem is solved? vs. Who wins if it remains a problem?
Who Loses?	Strangely enough people lose when problems are solved. A definition of ‘Office Politics’.
Why You?	Why is it your problem? Are you really the correct person to solve this problem?
Why Now?	Why did this problem happen now? Vs. Why is it now an issue?
What Caused?	Are you solving a symptom, or are you solving the root cause of the problem?
What Exists?	Data and information gathering is crucial!
What Matters?	Data and information are useless without analysis!
When Did?	Was this exact same situation ever not a problem?
What Changed?	In order for things to ‘go wrong’ something must have changed... what?
Where Else?	Is ‘it’ working properly anywhere else? What’s the difference?
What If?	Important: Techniques for finding the ‘box’ and then thinking ‘outside’ it.
Why Not?	More Important: Techniques for creating a culture where ‘What if?’ is embraced.
What Now?	So you think you’ve fixed the problem? What can you now do to prevent it in future?
What Next?	Creating a culture where PS flourishes.
So What? or... the benefits. Why you should attend:	Simply put, if we didn’t have problems, we wouldn’t have work. We’re employed to solve problems, to do things, to get things done. That said, solving problems is how we become more effective, efficient and how we make our work enjoyable. This problem solving course makes no distinction between ‘technical problems’ and ‘people problems’ - the techniques we use are the same. When we are solving Sudoku puzzles we use the same strategies as when we’re solving the difficult interpersonal problems of office politics.

Bio: Peter de Jager is a keynote speaker/writer/consultant on the issues relating to the challenge of managing change of all types within our organizations. He has published hundreds of articles on topics ranging from Problem Solving, Creativity and Change to the impact of technology on areas such as privacy, security and business. His articles have appeared in The Washington Post, The Wall Street Journal, The Futurist and Scientific American.

He is best known to IT audiences for his efforts to create responsible awareness of the Y2K issue – for which he received several awards from IT associations and Govt. Agencies. In addition to presentations and seminars on the topics above, he writes several regular columns. These include: **Association Trends**, **CIPS across Canada**, **Enterprise**, **Globe & Mail online** and **Municipal World**.

He has spoken in more than 35 countries and is recognized worldwide as an exciting, humorous, provocative and engaging speaker. His audiences have included the World Economic Forum, The World Bank and The Bank for International Settlements.

His presentations and workshops are highly interactive, fun, irreverent to mistaken ideas and most distinctively - provocative. He forces the audience, by demonstrating conflicts between their stated beliefs and behaviours, to think differently about what they thought they knew. You can read much of his work in the publications section of www.technobility.com – you can contact him at: Pdejager@technobility.com or at (905)-792-