Systematic Innovation

e-zine

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In this month's issue:

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PanSensics: Complexity Landscape

“Simplicities are enormously complex. Consider the sentence "I love you".”
Richard O. Moore

I’ve always been a fan of Dave Snowden’s Cynefin model. If for no other reason that it offers a smart way of segmenting a range of possible organizational contexts. Things in Cynefin world are either ‘obvious’, ‘complicated, ‘complex’, ‘chaotic’ or ‘not sure yet’/dis-ordered. Getting managers and teams to recognize the various different segments of the model is often sufficient to provoke a meaningful conversation that in turn has a pretty good chance of guiding users towards possible courses of action.

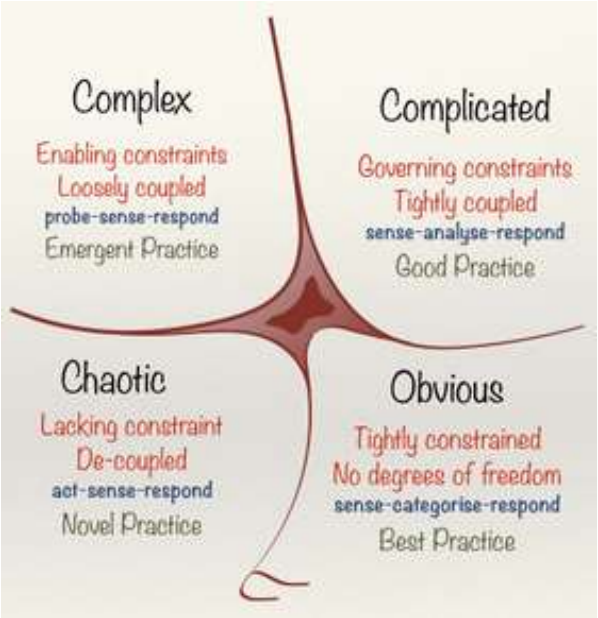

Figure 1: Cynefin Sensemaking Framework

At the same time, I’ve always had the nagging doubt at the back of my mind that half the model describes contexts that don’t actually exist in real life. When we’re talking about human beings functioning inside organisations, we’re fundamentally talking about systems that are complex. We can say this because much of what goes on between even a system containing just two people has much more to do with our emotions than it does our rational interactions. People do things for two reasons, to para-phrase the old J.P. Morgan aphorism, a good reason and a real reason. While our ‘good’ reasons for doing something might be ‘obvious’ or ‘complicated’, our ‘real’ reasons are inextricably linked to some pretty hairy biochemistry.

Thus, while we might surmise that a given organizational system is ‘obvious’ when we look at the procedures and protocols that are formally in place – patient triaging, for example, or a formal check-list ranking method for evaluating out-sourcing proposals – the reality, despite what the check-list designers might have hoped for, is that the actual system is very definitely complex.

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At the heart of this mis-match, for me, is another well-known aphorism, this time from Alfred Korzypski, who famously gave the world, ‘the map is not the territory’. We might construct a contextual map that declares a situation to be ‘obvious’ or ‘complicated’, but, whether we like it or not the actual territory is inherently complex. Or, possibly, depending on the levels of testosterone, cortisol, adrenaline and cocktail of other brain-altering chemicals, veering in the direction of Chaotic.

In reality, the organisation context ‘territory’ comes down to degrees of complexity, and whether the level has exceeded a threshold that has turned it into chaotic.

The Cynefin model, on the other hand, is a mental ‘map’ that has been constructed to help try and represent that territory.

What happens, I recently speculated, if we tried to construct a different map, one that configured the ‘map’ and ‘territory’ perspectives as separate, orthogonal axes? Here’s what I drew:

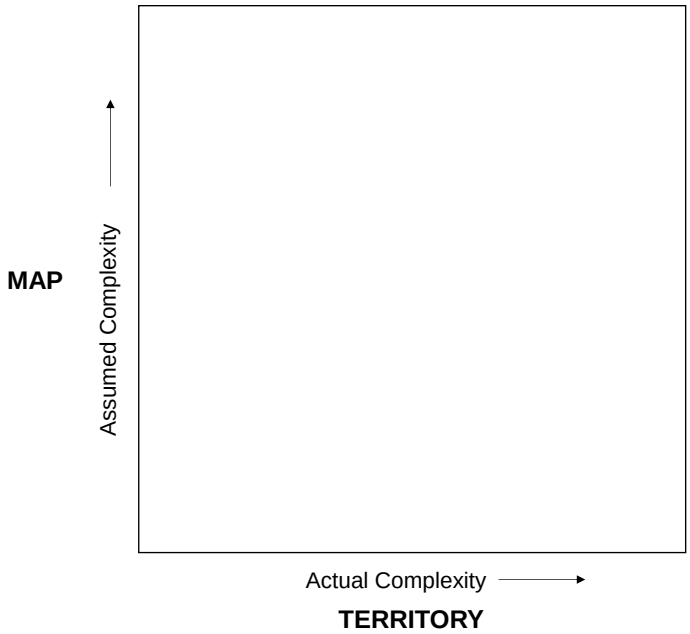

Figure 2: Axes Of A Different Complexity Landscape

At first I thought it was a bit trivial, and added nothing to what Cynefin was already doing. But then as I dug deeper, it started to feel like something potentially more significant was wanting to emerge.

Let me explain, then you can make your own mind up.

In keeping with my TRIZ background, one of the things I’m always on the look-out for are contradictions. Which, in the context of the map/territory axes I’d drawn, means looking for discontinuities. One very clear one is the sudden shift from ‘complex’ to ‘chaotic’:

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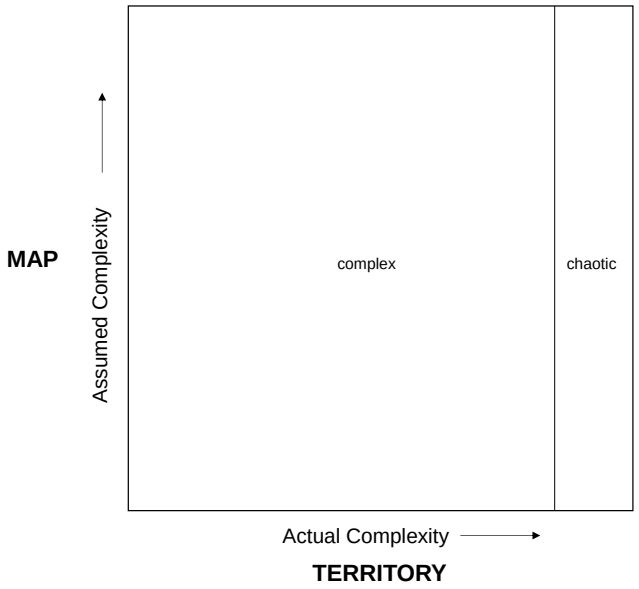

Figure 3: Axes Of A Different Complexity Landscape

When I think of this complex-to-chaotic shift my first thought usually goes to a barroom fight in Blackpool: one second there's the general hub-bub of people enjoying themselves in the company of a glass of beer or a Babycham, the next, someone has made eye-contact with the wrong person, and the whole room descends into a spectacle of flying fists, glasses and furniture.

Fortunately, chaos is very unstable and therefore very hard to maintain. The bar either completely collapses, or, some constraint – the local constabulary in my case – comes in to play to restore some semblance of order.

Chaos, in other words, can only increase so far before something emerges to cause things to wind their way back to a kind-of-stable complex system.

Some might say that this complex-to-chaos transition is the only real discontinuity that we can draw along the increasing complexity scale. I tend to think there's also a second one, albeit one that's a little bit more subtle.

One of the most important traits of a complex system in the mathematical sense of the expression, is that it bears a degree of self-organisation. Perturb a complex system and it tends to return to a 'preferred' condition, usually one that minimizes tension and stress forces. One of the most frequently used analogies in this regard is a marble sitting at the bottom of a bowl: roll the marble up the sides of the bowl and then let go, and gravity will do a nice job of encouraging the ball back to the lowest point.

Figure 4: Stable Equilibrium

A useful way to picture the increasing complexity axis is to imagine the sides of the bowl getting shallower and shallower the further up the complexity scale we go. When complexity is low, the bowl has very steep sides and as such, the marble becomes less and less likely to deviate from the lowest point, and will return to it much more quickly should any deviation occur. When complexity increases, the more gradual the bowl's

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slope becomes, and thus the easier it is for the marble to roll around, and the longer it will take to find its way back to the lowest point.

If you can imagine the sides of that bowl getting less and less steep, eventually you reach the discontinuity point we're looking for. Sooner or later the bowl becomes flat. When the marble gets disturbed now, it has nothing to cause it to return to its original, lowest, position. When the bowl as curving sides, scientists call it 'stable equilibrium'. When the bowl becomes flat it is called 'neutral equilibrium'. Then, if you can push your imagination one step further, there is another condition called 'unstable equilibrium' which is the situation where the sides of the bowl start to curve the wrong way:

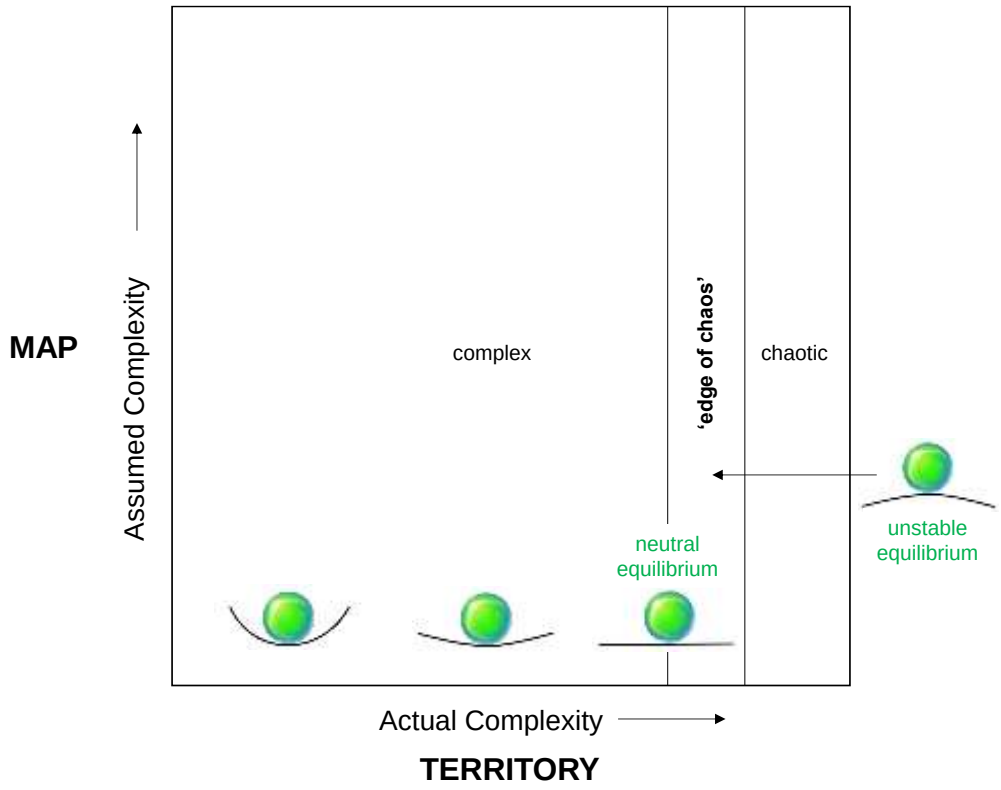

Figure 4: Neutral Equilibrium & Edge Of Chaos

Disturb the marble in this situation, and it definitely will not return to its original position. This is the marble that's found its very own version of chaos. It's going to keep falling until such times as it finds another stable resting place – the table on which the bowl is standing maybe, or the rug on which the table is standing, or the hole in the floorboard next to the rug. The marble in effect remains in chaos (ree-falling) until it finds a new stable low point.

So, looking at the complexity axis on the Figure 4 map, as well as the discontinuous shift from complex-to-chaos, there is another one that denotes the disappearance of stable equilibrium and the arrival of neutral and then unstable equilibrium. Because this space turns out to be quite important, scientists tend to give it the name 'edge of chaos'. It's the place where a system has lost its ability to self-organise. It's also, per the complexity cliché, the scenario where the butterfly flapping its wings in Rio causes that barroom fight in Blackpool. Or Hull. The other place where I tend to find myself in bar-fights. Small triggers, in other words, can end up creating enormous changes.

What makes this 'edge of chaos' region so important is that a very large number of systems find themselves operating here. Including a scarily large proportion of the organisations that we might find ourselves working in.

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There are various reasons why this is so, but the one that helps me to visualize it best ('the map is not the territory, remember?) involves the concept of 'satisficing'. Nature and natural systems have a very strong tendency to evolve to be 'just good enough' for the jobs they have to do. I was thinking about this recently when I found myself trapped in a room with a very annoying fly. After ten minutes of listening to its annoying buzz, I'd had enough and set out on a mission to swat it. Ten minutes later, after making a fool of myself flailing my arms around like Bez on a good night, the fly is shaking with laughter, perched up on the ceiling mocking me.

It's only when I decide to go and find the fly swat that the mocking ceases and the fly population of the room is back down to a much more calming level of zero. The point being that, in our evolutionary past, flies had a very strong evolutionary imperative to be able to accelerate away from a predator (human hand in this case), so flies that could accelerate faster than the fastest hand had a much stronger likelihood they would live to breed, and thus create new flies that could also accelerate faster. But once *al*l flies can accelerate faster than *any* human hand that evolutionary pressure disappears. Now there is no advantage to the fly that can accelerate faster than the other flies. So the race stops. Man being man, and flies being annoying, sooner or later (definitely 'later' if we're thinking in evolutionary timescales), man invents the swat. And suddenly acceleration rates become a problem for the flies again. Their 'fast-enough' satisficing world is no longer satisfactory. The stable equilibrium of the man-versus-fly world has been made unstable by the arrival of the man-plus-swat-versus-fly world.

A lot of modern organisations are – usually unwittingly – managed along these same satisficing lines. The first fly swat manufacturer builds a great business and gets to get fat and happy watching the money roll in. Until a competitor arrives. Chaos ensues for a while, market share is lost, then won back again, and everything settles down to 'normality' once again. Managers think the problem is over, so they set about doing what businesses do – designing fly swats that make customers happy, making them as cheaply as possible, and avoiding having to think too much about anything in particular. And all is well until a third competitor arrives and the fly swat market becomes truly competitive for the first time. Now the manufacturer has no choice but to exist at the edge of chaos, because the other two manufacturers are continually trying to take away their market share, and there is no possibility of a stable situation in which all three are happy with their market share.

'Satisficing' in this case has evolved to become something much more sinister. A whole other reason why many organisations find themselves living in the 'edge of chaos world'. Customers love genuinely competitive markets and so will always encourage at least three players into those markets. Put three organisations in the same market place and there is no stable equilibrium any more. Fly-swat manufacturers that wish to continue trading in this dog-eat-dog competitive world are no longer allowed to rest on their laurels. All thanks to the unconsciously canny shopping wiles of the consumer.
Okay, enough already. Time to get back to the main point. Notice at this stage that we have not drawn any horizontal lines on the map-territory landscape picture. That's because, at this stage it is difficult to see evidence of actual discontinuities in the perceptions we have about levels of complexity in the systems we operate. We could draw the four main Cynefin regions onto the picture maybe, but at this stage I'm not sure it would help anyone.

My next thought about other possible lines began when I started to think about this diagonal:

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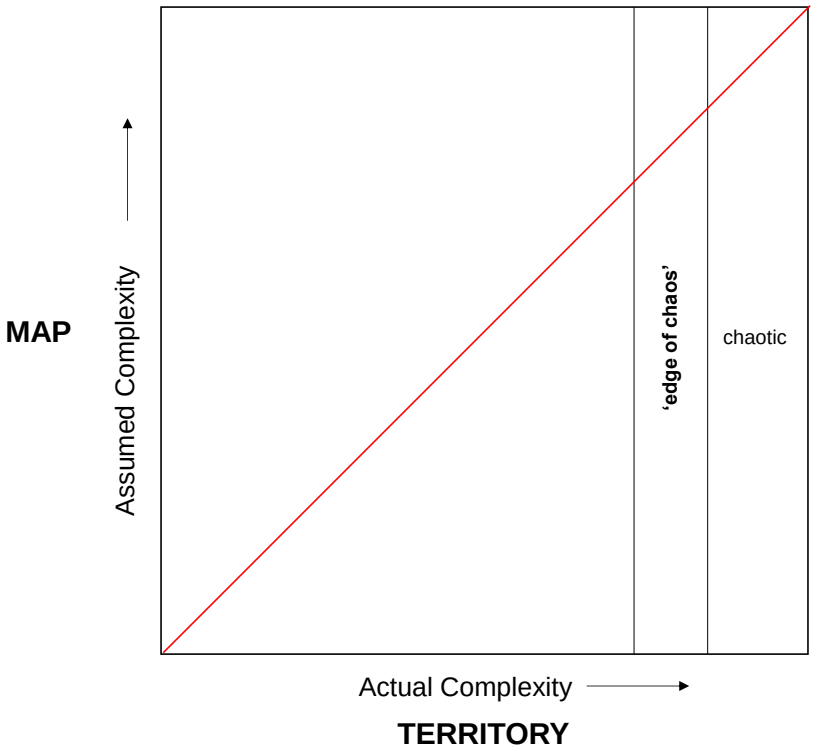

Figure 5: A Diagonal Line…

This is the line denoting situations where 'The Map' exactly corresponds to the 'The Territory'. As such it must have some kind of significance; it's where our assumptions about the level of complexity present in a system matches what's actually happening. In that sense, it might all be somewhat theoretical, because, how would anyone know that they've got their assessment just right?

Maybe, therefore, it's not the line that's important so much as what the world looks like on either side of the line? Here's the point I made the connection to cyberneticist, William Ross Ashby, and in particular his 'Law of Requisite Variety'. The Law probably stands as one of the most obvious sounding, least well interpreted statements ever. 'Only variety can absorb variety' was Ashby's expression. What it means in practice is that, if you're trying to 'control' a complex system, you need to understand the variables present in that system and make sure your control system has at least as many variables in it. Requisite Variety is thus the point at which you have 'just enough' variety to ensure the system remains under control. This might still sound very theoretical, but it does at least allow us to give our diagonal line a name: it is a line that represents the boundary of requisite variety. Anywhere above the line means that our perception of the complexity of a situation is greater than the actual complexity, and thus we have exceeded the minimum requirement to be able to remain in control of that situation. Anywhere below it and we have failed Ashby's Requisite Variety test. If we operate anywhere below the line we are fundamentally incapable of ensuring we're in control of the system. In the context of the map we're drawing, this above or below Requisite Variety distinction seems to hold some kind of importance. We decided to keep the line, and rather than live with the mouthful that is 'the Line of Requisite Variety', decided to call it the Ashby-Line.

In a vaguely similar fashion, being fans of Nicholas Taleb, it felt appropriate to call the region above the Ashby line 'AntiFragile'. i.e. it's the zone where, because we've over-estimated the actual level of complexity present in a situation, we've made ourselves capable of not only handling anything that the complexity might throw at us, we're also

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able to use our ‘excess’ capability to learn from what’s happened and thus make ourselves even stronger.

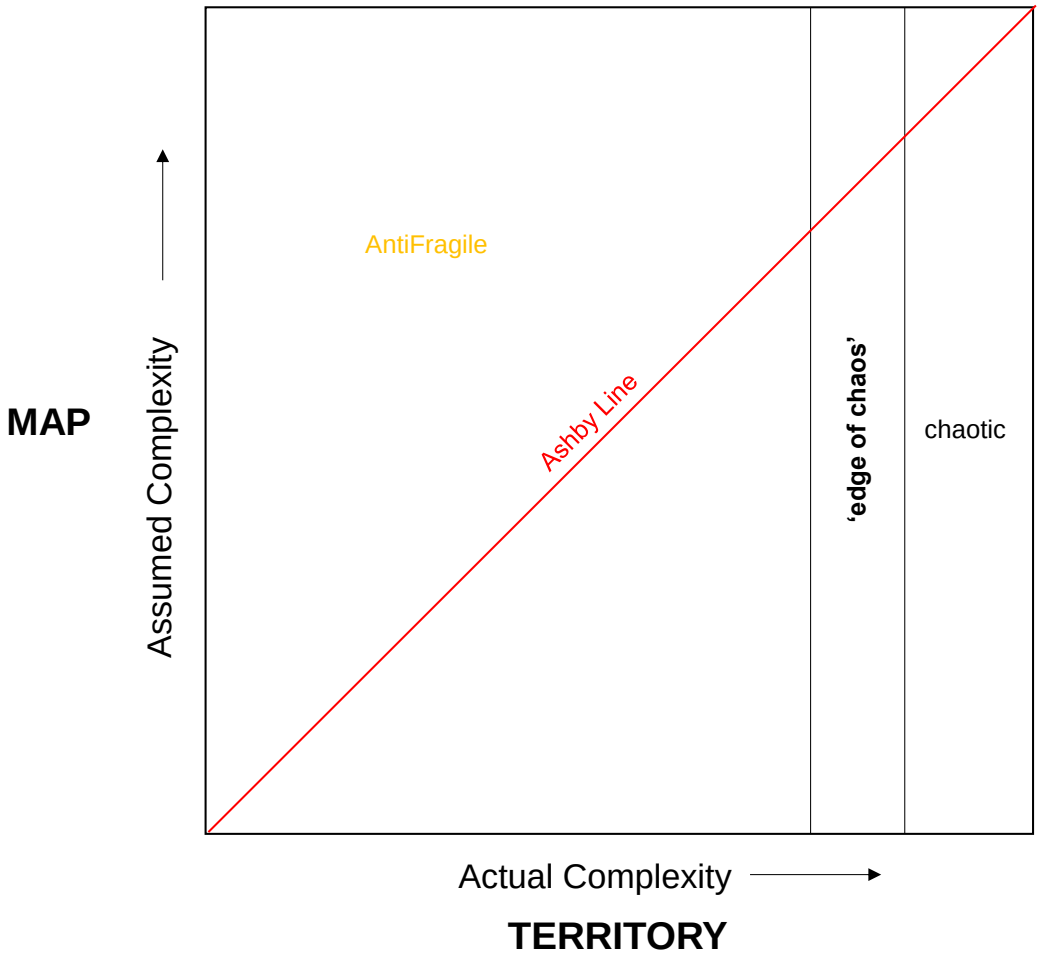

Figure 6: …The Ashby Line And ‘AntiFragile’

Operating above the Ashby line is all about mastery of a situation. That can also mean mastery in situations where we’re at the (actual) edge of chaos, or even in chaos itself. This is the situation, we began to imagine, that most genuine innovators find themselves. It’s the world they tend to call ‘exploration’. These are the situations where a team understands the importance of edge-of-chaos and chaos in the new solution finding parts of the innovation process, and hence deliberately put themselves in such situations. This is the team that is still looking to diverge and generate even more clues and ideas, even though their managers are pulling out their hair with frustration. It’s also the team that has understood the true meaning of so-called ‘design thinking’.

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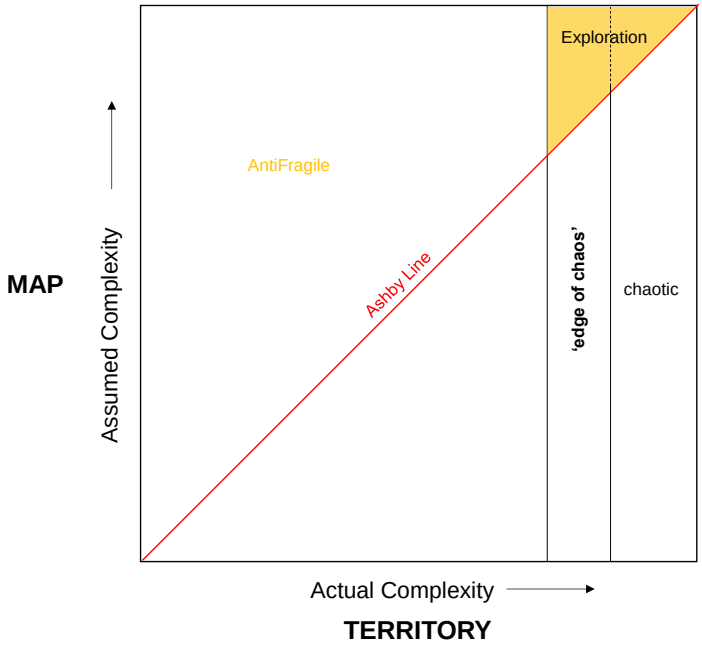

Figure 7: Genuine Innovator 'Exploration' Zone

When these situations arise, they're symbolic of the fairly common situation of an innovation team busy doing what they do in the Exploration Zone, and a group of managers that are stuck watching them from somewhere on the other side of the Ashby Line…

…which is probably where we need to head next…

…this time, it feels easier to show the picture before describing the new content:

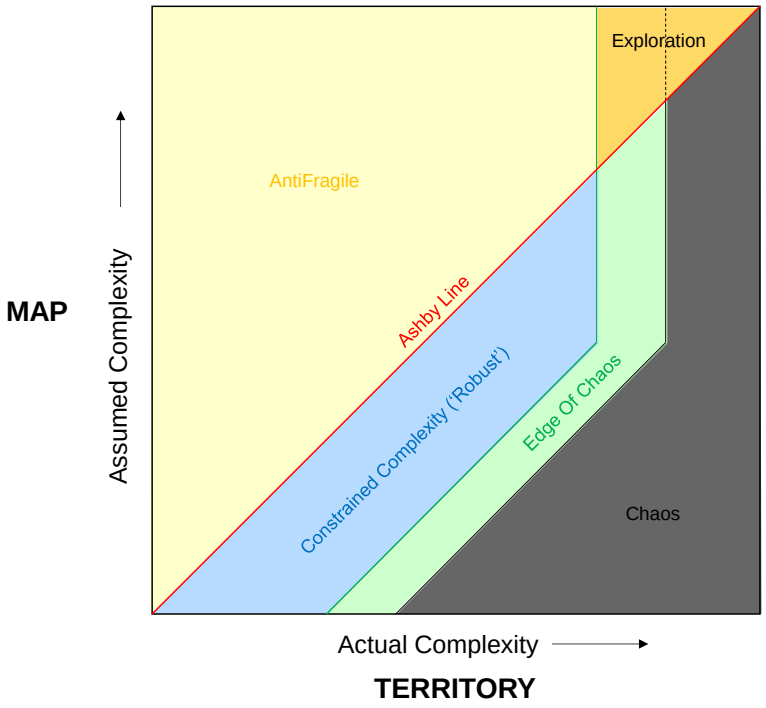

Figure 8: First Attempt At Overall Complexity Landscape

Probably the best place to start when we look at what's been drawn in the big triangular region underneath the Ashby Line is the bottom right hand corner of the landscape – the point where the actual complexity is at its chaotic maximum, and our assumed complexity

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is at its minimum. Again, very theoretical, but hopefully a useful way to introduce the idea that the further we are away from the Ashby Line the more deluded (or dangerous) the situation we find ourselves in is. Any new diagonal line that we might care to construct parallel to the Ashby Line could be taken to represent a 'line of constant delusion'.

I've drawn two of these lines onto the Landscape: one describing the complex-chaotic boundary, and the other describing the transition from stable to neutral equilibrium.

The two lines in turn define three regions, two that I've already described – 'chaos' and 'edge of chaos' – and a new one labelled, 'Constrained Complexity'. At this point in time, I'm not sure that's the right label, but hopefully its representative enough to convey the important meaning. It's a region that's below the Ashby Line and therefore doesn't meet the Requisite Variety criterion. By rights a system operating in this segment of the landscape is at some kind of risk because of this oversight. In reality, however, we can see many examples of systems that manage to operate quite satisfactorily without achieving requisite variety.

I spent the first fifteen years of my career designing jet engines. Not quite the most complicated pieces of engineering on the planet, but somewhere close. The first engine I helped design was the engine still found in the Lynx helicopter, the 'Gem'. It was an engine often referred to by operators as a 'Swiss-watch of an engine'. Which basically meant, 'fantastically impressive while it was working, and an absolute nightmare when you had to do any maintenance on it'. Fortunately, unless the pilot decided to fly through a sand-storm, it has proved to be a remarkably reliable engine. I call it 'complicated', but the reality is that it is an engine – like any other jet engine – that contains a whole bunch of things that the designers don't really understand. If that sounds a little bit worrying to you as you contemplate the next moment you step on to a plane, it's worth bearing in mind that the aerospace industry achieves the best safety record of any industry on the planet. To give you an example of just how safe it is, try and imagine the best hospital in the world and then multiply the performance of that hospital by around 1,000,000. The industry achieves this amazing capability by adding in a host of safety factors to take account of all the things that aren't fully understood. The whole thing works something like this: make the very best estimate you are able of how much material you need to achieve a certain level of strength in each component, then get someone else to check it, then someone else, then double it, then test it, test it again, and test it again. Oh, and if anything goes wrong during one of those tests, make sure everyone knows about it, so no-one ever repeats the failure again. This is 'constrained complexity' in action: making use of safety-margins and past experience to ensure the marble is never able to rise high enough up the sides of the bowl that it could ever fall out.

In contrast to Nicholas Taleb's 'AntiFragile' concept, I think of this kind of safety-margin laden engineering as 'Robust'. A robust solution being one that will survive anything you throw at it, provided – and here's the tricky bit – what gets thrown is something you knew could be thrown. If there's something out there that you didn't know about, your system may turn out to be not robust enough to survive it. 'Out of the ordinary' events, in other words, have an annoying propensity to destroy systems that are 'merely' robust. You can bet your house that the designers of the Fukushima Daiichi nuclear power generation plant did the very best job they could to build the most robust installation they could possibly imagine, but sadly, they didn't understand the truth of Ashby's Requisite Variety law, and hence learned a very unfortunate lesson. That there are an awful lot of other industries and organisations operating under the auspices of a desire to be 'robust', Fukushima and the 'Constrained Complexity' of the Figure 8 Complexity Landscape have

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a lot to tell us about the importance of making sure the level of complexity we've assumed is present in a system is at least consistent with the actual level of complexity.

Okay, too depressing now. Time to move on again…

..so far, in my attempts to draw meaningful lines on the picture, I've only really considered the actual complexity ('Territory') aspects of the Landscape. Time to look at the world from the 'assumed complexity ('Map') perspective. Which in effect brings us full circle back to Dave Snowden's Cynefin framework. The next picture represents my best attempt at mapping the four main Cynefin domains onto the Complexity Landscape:

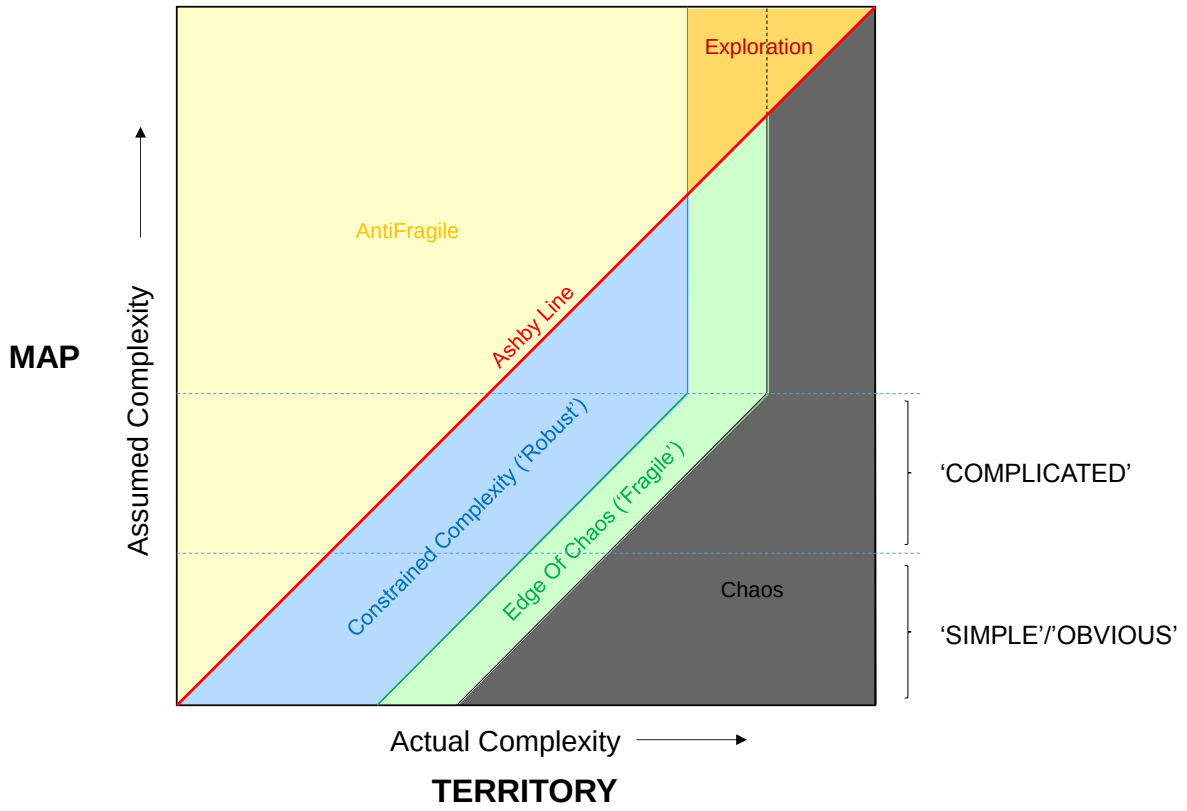

Figure 9: Mapping The Cynefin Framework Onto The Complexity Landscape

The first thing that happens when I do this is a realization that the axes I've chosen in effect make it meaningless to try and draw the 'complex' and 'chaotic' boundaries as a horizontal line. The option becomes somewhat more meaningful with the other two regions: 'obvious' and 'complicated', because they are totally about 'assumptions' regarding how the world works. How far up the Map axis of the picture I might chose to draw them is a little bit arbitrary, but that's rather a problem coming from the artificiality of Cynefin rather than the axes I've chosen to use in the Landscape.

Whether I've drawn the lines in the 'right' place or not, I think it becomes possible to see why Dave Snowden is forced to write things like 'typology of contexts that guides what sorts of explanations of solutions *might* apply'. Just because you've made an assessment that your system fall in to the 'obvious' category, for example, doesn't mean you're right. Plotting a horizontal line to denote where the boundary between obvious and complicated might be on the 'Map' axis of the picture, clearly highlights the presence of four different possibilities back in the real world:

1) We've over-estimated the actual level of complexity and hence are 'anti-fragile'.

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2) We've under-estimated complexity, but we've imposed some constraints that appear to make the system behave as we intend, so we're in the 'Constrained Complexity' domain.
3) We've under-estimated complexity and are operating at the edge of chaos
4) We've under-estimated complexity and are in chaos.

While the fourth of these options doesn't appear to be that likely, it's actually a much more common situation than one might imagine. Largely because of a fairly common business scenario in which organisation's find themselves operating their usual check-box processes and haven't realized that the complexity of the actual world outside the factory gates has increased somehow. Think Hurricane Katrina for a good example of what happens when the emergency recovery team tries to solve a problem – the levees breaking – using pre-written 'obvious' emergency-protocols and instructions that turn out to be massively inappropriate.

Even if we're not actually in this chaos zone, the reason it's important to know about the four options is that each of them demands a different response. It's here where we really experience the truth of the 'might' word in Dave Snowden's Cynefin description. Continuing to use that annoying check-list will probably be appropriate if you're in the AntiFragile' domain, and might still be relevant in the Constrained Complexity domain, but it surely isn't in either of the other two.

Yes, But…

The importance of knowing where we are on the Map opens up a significant new problem: that of knowing how to work out where we are on the Map. Here's where the rubber really needs to hit the road, since there's little point in building any kind of abstract theoretical construct if it cannot be meaningfully translated into some form of practical use. Fortunately, this is where the PanSensic capability comes in to play. We believe it is possible to measure both the actual and assumed complexity within, say, an organisation to a sufficient level of confidence that it is at least possible to work out where a team, or department, or the senior leadership team, or the overall enterprise is on the Complexity Landscape. This being the important part of the story: can I know accurately enough where I am to ensure that I deploy the most appropriate strategies when it comes to making some kind of a change?

Measuring a position up the vertical axis is easy enough as it typically involves looking at the sorts of protocols and practices that are in place in the organization. It can also involve scraping of email traffic or internal reports in order to analyse the sort of language that people within the organization are using.

Knowing where the actual ('territory') level of complexity is, on the other hand, can be really quite difficult. Especially given that the majority of managers working within our organisations have little if any comprehension of complex adaptive systems in the first place. As we've been designing and building the PanSensic capabilities, this is where we've had to devote the most effort. Thus far we've identified over two dozen characteristics that can be meaningfully correlated to the actual level of complexity in an organization, or part thereof. Here are some of what we believe to be the most significant:

- Thinking Styles of individuals and diversity of Thinking Styles across the organization
- Strength, frequency and diversity of internal communications (email traffic network flow analysis)
- Staff engagement levels
- Senior leadership team flux

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- Business and Innovation strategy fluxes
- Industry pulse –rate (how often are step changes happening?)
- Evolution Potential of the organizations' products and services, and of the organization structure
- How frustrated are customers and likely customers (based on our Frustration Map tool)
- Patent generation rate of organization and competitors
- Market position of the organization (is it in the Top Three, regionally, continentally, globally? is it a niche player?)
- Share-price flux
- Proximity and likelihood of outside-industry disruptors

Integrate all of that stuff together and you find yourself ending up with an ability to construct this sort of picture:

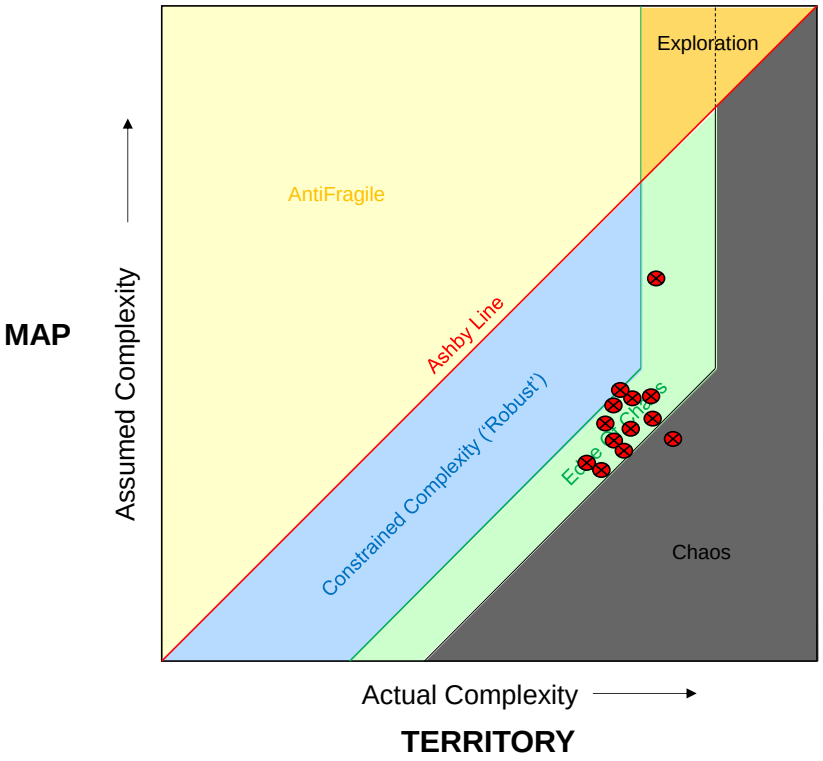

Figure 10: Mapping Parts Of An Organization Onto The Complexity Landscape

And now, finally, you have a picture that makes some kind of actionable sense. Already this 'Complexity Landscape' has become one of the first PanSensic assessments we will look to make when we start working with a client. In part because it helps people to picture something in a way they very likely hadn't thought about before. But mainly because it serves as an elegant platform for explaining a whole host of different organizational scenarios, goals, dysfunctions and challenges, from our Innovation Capability Maturity Model, through to Merger & Acquisition due diligence, through to strategic planning and even generational cycles and their causal link to why society keeps oscillating between boom-and-bust crises. Even why barroom fights are far more likely to happen in Blackpool and Hull. Expect to hear more of those stories in future articles. In the meantime, if this article does nothing other than make readers think about where their organisations might be on the Landscape, or make them more aware of their likely high current level of fragility, or their need to become more 'anti-fragile' – Nicholas Taleb, as ever, is right on the money – we've probably done something useful.

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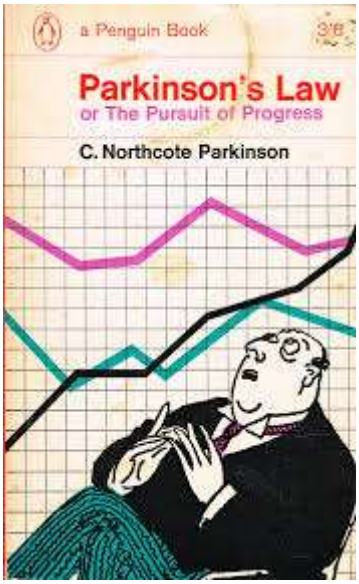
Case Studies: In (Partial) Defence Of Parkinson's Law



Parkinson's law famously states, "work expands so as to fill the time available for its completion". It was first articulated by Cyril Northcote Parkinson as part of the first sentence of a humorous essay published in *The Economist* in 1955, it was reprinted with other essays in the book *Parkinson's Law: The Pursuit of Progress* (London, John Murray, 1958). He derived the dictum from his extensive experience in the British Civil Service. In its modern reading it is often used as a means of explaining the creeping expansion of bureaucracies across every kind of organisation. Parkinson explained the effect by identifying two of its underpinning forces: (1) "An official wants to multiply subordinates, not rivals" and (2) "Officials make work for each other." He further noted that the number employed in a bureaucracy rose by 5–7% per year "irrespective of any variation in the amount of work (if any) to be done".

Our interest in Parkinson's Law was piqued following a discussion about waste reduction inside organisations. How come, we were asked, managers seem to be able to recruit someone into a new job, spend a week training the new person, and then have them be precisely 100% busy ever after? How did they have the foresight to precisely size the job in the way they did? How is it that the workload could be designed to remain at precisely the level required to ensure the new person would be continuously busy?

The answer, obviously, is that no manager is smart enough to make that kind of estimation. We do the best we can, and Parkinson's Law does the rest.

With this in mind, we thought we'd try and explore the Law in a bit more detail to see whether it is a fundamental characteristic of all humans, and, perhaps more importantly, establish whether anything can be done to mitigate the 'waste' problems it apparently seems to cause.

The first thing we did, then, was trawl around the internet and some of our past client projects for possible other reasons beyond the ones identified by Parkinson that the Law exists and persists. So, in response to the question, 'work expands to fit the time available because…', we ended up with the list of perceptions reproduced in Figure 1:

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1	managers want to multiply subordinates (not rivals)
2	managers make work for each other
3	people are naturally lazy
4	'if I do this quickly, my reward will be more work'
5	desire to stay in comfort zone
6	desire for an easy life
7	sliding down a slippery slope & can't get back up
8	people don't like making decisions & procrastinate
9	desire to be in control
10	desire to not stand out from others/be part of the tribe
11	wrong decisions may reveal a lack of competence
12	meaningless work
13	procrastination is a basic human need
14	the next job might be worse than this one
15	why would i volunteer for more work?
16	life is too overloaded elsewhere, work is easiest place to 'bunk off'
17	it's nice to get away with stuff
18	employer steals my time, this is how I get it back again
19	bosses keep adding new stuff into agreed programme
20	continuous improvement has sucked away all the fat, so we're all overloaded
21	life is complex so sometimes delaying til the last minute allows changes to be built in
22	people work better when they're allowed to incubate and finish with a surge
23	people get defensive if you challenge what they're doing
24	managers don't like to confront difficult issues

Figure 1: 'Work Expands To Fit The Available Time Because..' Perceptions

From here, per the usual Perception Mapping tool convention, the job was to explore the relationships between these perceptions by identifying the 'leads to' connections between each perception and the others.

When we did this exercise, we ended up with two loops, signifying the presence of two independent issues pertaining to the Parkinson's Law phenomenon. Figure 2 illustrates one of these loops:

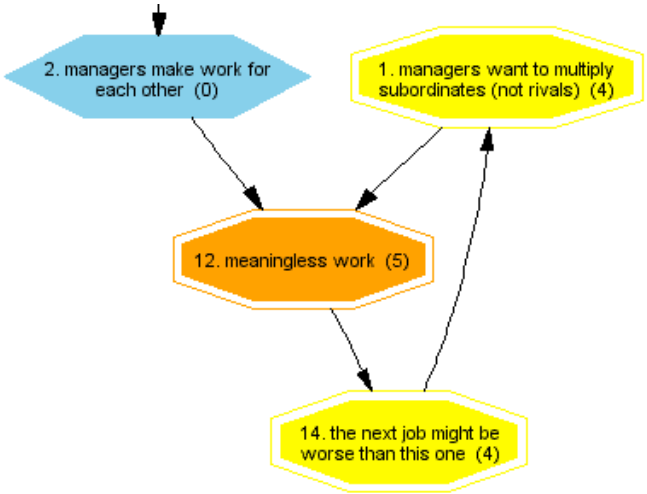

Figure 2: Work Expands To Fit The Time Because… Managers Create Meaningless Work

As often occurs when we construct a Perception Map we reveal a situation that begins to appear 'obvious' again. That's 'obvious' in the sense that the solution to the problems arising from this kind of situation typically come down to 'stop doing what you're doing'. If worker's are giving subordinates meaningless work, it shouldn't be a great surprise to

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learn that that will soon establish a downward spiral in which subordinates come to expect meaningless work, which in turn provokes them to try and find someone else to off-load it on. And if that is what is happening in many of our organisations, then not giving people meaningless work seems like the very definition of an obvious solution.

Just in case we might wish to dig a little deeper, Figure 3 shows what happens when we map the conflict between the desire to stop work expanding to fit the available time versus the unfortunate propensity for managers to hand out work meaningless work onto the Business version of the Contradiction Matrix:

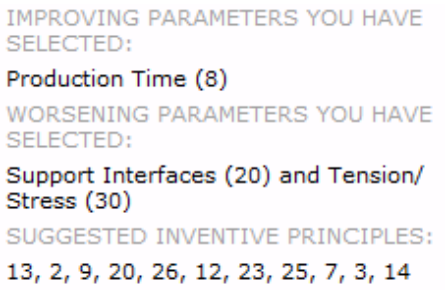

Figure 3: Mapping The Meaningless Work Conflict

No surprise that we see Inventive Principle 2, 'Taking Out' high in the list of solution strategies. Other insights revealed from the Principle list when we showed it to a group of people interested in resolving the Parkinson's Law waste problem included:

- Providing feedback loops that allow the 'meaningfulness' of a piece of work to be measured – i.e. make it visible when managers are creating meaningless work
- Allow workers mechanisms to challenge work that they believe to be meaningless
- Explicitly emphasize for workers why a given piece of work that is about to be instigated is meaningful ("we need you to do this so…")
- Allow workers to configure jobs themselves that allow the meaning to be included.

Given, then, that we can frequently see workplace statistics declaring that 80% of workers and 'dis-engaged' from their work, perhaps the starkest conclusion that can be drawn from this side of the analysis is that the creation and maintenance of meaningless work is the 800lb gorilla in most enterprises. It might just be the ultimate form of waste.

It perhaps also raises the question of 'what is meaningful work?'

With this question in mind, it might be useful to now look at the other loop emerging from our Perception Map. Figure 4 reproduces that second loop:

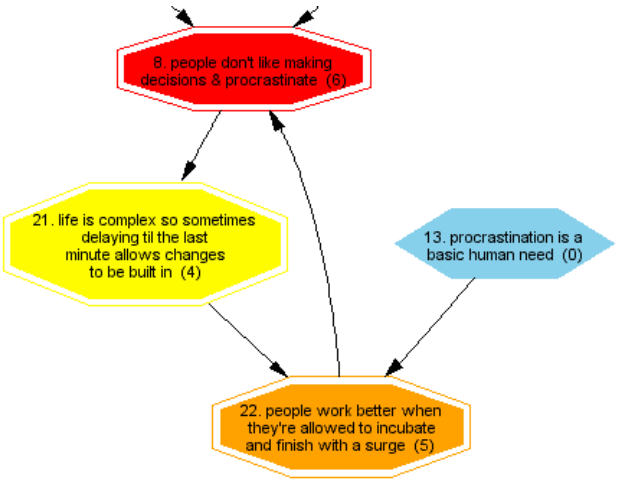

Figure 4: Work Expands To Fit The Time Because… Procrastination Can Be Useful

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The perhaps peripheral connection between this loop and ‘meaningful’ work is that meaning comes from some form of conscious thought and people that are in control of that thought. Good work, in other words, is work that engages people by encouraging them to think.

What the Figure 4 loop is saying more directly, though, is that, especially if we are working in a complex environment (if it involves people at all, we already know it is!) sometimes procrastination can be a good thing. Allowing work to expand to fit the time available, in other words, is time that is actually useful incubation time. Or it is provided people are appropriately engaged. ‘Procrastination’ in a complex environment is all about making yourself open to the possibility that valuable new information might appear at any moment to affect the answer you’re looking for, and incubating ideas and idea combinations that give rise to a better eventual solution. For the engaged person, working in a complex environment, Parkinson’s Law might well be just what they need in order to do meaningful work and deliver meaningful solutions.

If there’s a problem here it is probably the negative connotation, if not stigma, that comes with the word ‘procrastination’.

That said, it is still going to be a brave manager that is seen to visibly endorse ‘procrastination’ amongst the members of the team they’re responsible for. Another important characteristic of complex problems, then, is that the best strategy for making progress on them is to conduct rapid learning cycles making use of probing experiments and minimum-lag feedback loops. If there’s a Parkinson’s Law problem in this scenario it is most likely to do with the fact that most projects are managed in a fashion analogous to driving through a tunnel. When we start a project, we in effect enter a tunnel that isolates us from what’s happening in the world around us, and we only emerge from the tunnel when we have our ‘answer’. A far better metaphor for meaningful, complex problems is a satnav map. Something, in other words, that’s able to recalculate our route whenever we encounter a block or try an experiment that offers up some new information about the best way to get to our desired destination.

In this respect, we might map the Figure 4 Parkinson’s Law ‘problem’ as follows:

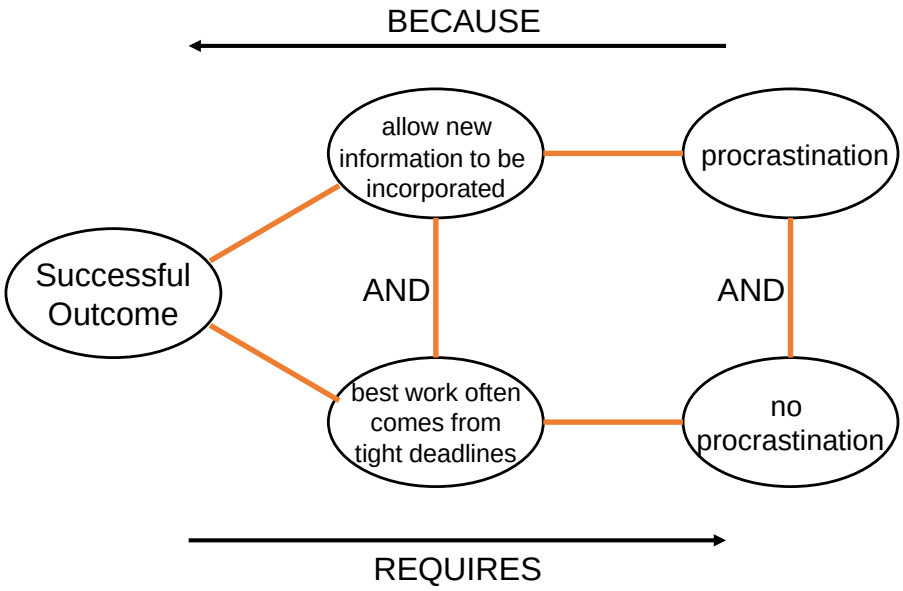

Figure 5: Mapping The Procrastination ‘Problem’

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Which, yet again, when we map onto the Business Matrix, we find we're not the only people in the world who have had to tackle this problem. Here's what we obtain when we map this problem onto the Matrix+ software wizard:

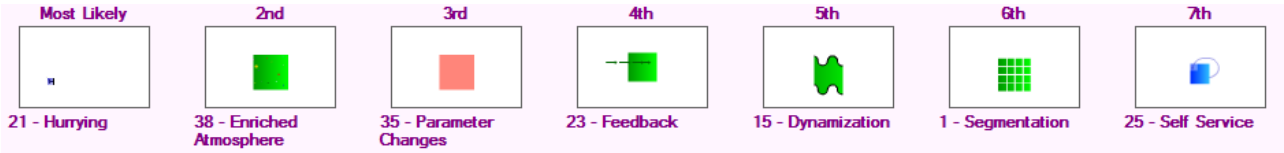

Figure 6: Someone, Somewhere Solved The Procrastination 'Problem'

Which, if you had to coalesce everything together, you might just conclude corresponds to the work of USAF pilot, John Boyd and the culmination of his study of what makes a successful fighter pilot – the ultimate complex system problem solver - the OODA loop:

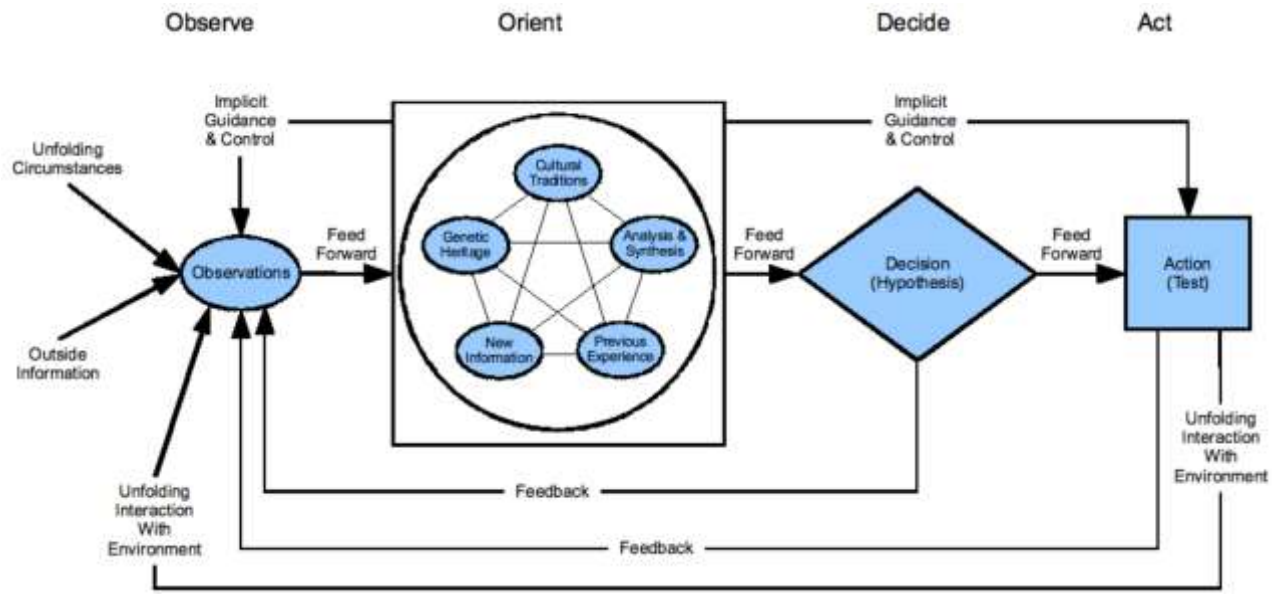

Figure 7: OODA Loop Solution To The Complex Problem/Procrastination Problem

In Boyd's terms, Parkinson's Law – aside from the meaningless work issue – is only a problem if your OODA cycle time is longer than that of your competitors. If it's not, then more likely than not, the fact that the (thinking) work expands to fit the available time is probably the best resource a manager will ever have.

In summary: Parkinson's Law. Only a problem if work is meaningless. If the work is meaningful – and why would anyone deliberately set about designing work that isn't? – all we need to do is remember there's such a thing as 'good procrastination'. And also the idea that there is an eminently calculable procrastination optimum.

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Definitely Not Funny – Bad Taxidermy

I have to admit that out of all of the hobbies and pastimes that exist in the world, the one I understand the attractions of the least has to be taxidermy. First up, the actual act of stuffing a dead animal for pleasure seems distinctly disturbing. But then also, I don't really think I understand why someone would want to display the results of this activity in their house either. Oh, sure, I can imagine that a grieving pet owner – someone by definition not in the most amenable state of mind to make sensible decisions – might decide to have their precious Rover preserved for future generations. And I can even see that a hunter might want a permanent reminder of the bit of nature they killed (way to go!). but… really?

Meanwhile, given that we're supposed to be talking about contradictions and the like, it dawned on me that taxidermy is in fact all about contradictions: I want my pet, but my pet is dead. Or I want my prey and it is also dead.

To that end, we could probably think of taxidermy as a Principle 30 solution to the want/dead dilemma. Or something like that. Looking at some of the 'attempts' that can be found on the Internet these days, there's probably also a rather unhealthy dose of Principle 16:


…or is it Principle 17?

These ones are definitely Principle 2:

I'm not surprised the wolf is angry. 'Where's my ears, you clot?'
The donkey, I just don't understand. On any level.

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Okay, these are the Principle 16 ones. It can be sooo difficult getting the facial expression, right? I'm not sure who's least happy the polar bear (someone's pet?) or the otter? At least, I think it's an otter.

For some reason, the fox seems to find itself a frequent taxidermy victim. Does this mean Principle 6? Or 33?

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Finally, though, as any good horror film director knows, the scariest monsters are the ones we never get to see:

Principle 34 anyone?

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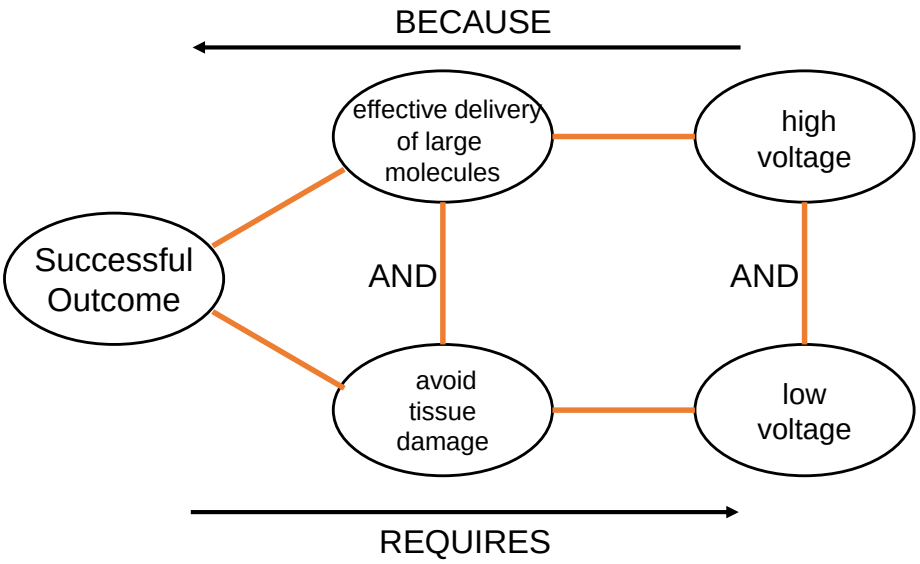
Patent of the Month – Electromotive Delivery Of Macromolecules

Patent of the month this month comes from the medical school at the University of Florida. US8,838,229 was granted to a team of inventors on September 16. Here's what they have to say about the problem addressed through their invention:

Short polymers of nucleic acids termed oligonucleotides have the capability to silence protein production by either modifying or degrading the messenger ribonucleic acid (mRNA) template rendering it untranslatable. These oligonucleotides have potential therapeutic applications if they are targeted to deleterious endogenous genes, or even exogenous bacterial or viral genes. In order to be effective, the oligonucleotides need to be delivered into the cytoplasm (ribozymes and deoxyribozymes) or into the nucleus (short-interfering ribonucleic acid (siRNA) and micro-interfering ribonucleic acid (miRNA)). A method of delivery using electromotive force to drive the highly charged oligonucleotides from an external delivery solution into the cornea is referred to as iontophoresis. Iontophoresis has been used to deliver small ionic drugs into the cornea. Because nucleic acids are significantly larger than small ionic drugs, high doses of electricity can be needed to effect delivery. Although the process of iontophoresis dates back to the early 1900's, the process has not been understood well enough for efficacious macromolecular drug delivery without significant tissue damage.

Here's how we might map that problem onto the Contradiction Template:



Which in turn leads to the following Inventive Principle suggestions, when mapped on to the Wizard in the Matrix+ software:

35, 3, 12, 5, 14, 19, 40, 18, 13, 2, 24, 17,
1, 34, 11, 7, 31, 23, 39, 37, 15, 36, 28,
25, 9, 8, 10

And here's how the inventors have managed to solve the problem:

1. A device for electromotive delivery of macromolecules, the device comprising: a first chamber having a first distal end for contact with a tissue of a patient, wherein the first distal end of the first chamber allows a macromolecule delivery medium in the first chamber to contact the tissue of the patient; a second chamber having a second distal end for contact with the tissue of the patient,

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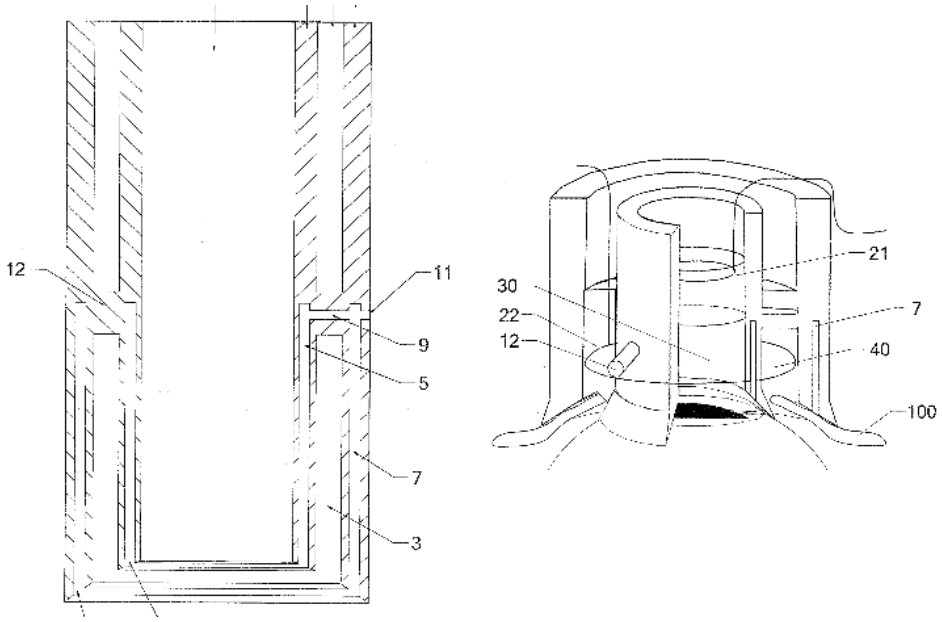
wherein the second distal end of the second chamber allows a receivable medium in the second chamber to contact the tissue of the patient; a connector connecting the first chamber and the second chamber together; a first electrode within the first chamber; a second electrode within the second chamber; and a voltage source, wherein the voltage source is capable of applying a voltage between the first electrode and the second electrode.

Which looks something like this:



Where the thing on the bottom right is someone's eye, one of the primary delivery targets for the invention. The invention actually works through a (Principle 1) Segmentation method and device that is able to control the ionic strength, or resistivity, of the delivery system and keep it low, while having a sufficient buffering capacity that eliminates the caustic byproducts of electrolysis, primarily catastrophic tissue destruction. This allows the macromolecular solution to be delivered to the desired tissue via one or numerous electrodes tightly bound to a matrix or other structure, such as cotton or a gel (Principle 24), which prevents or reduces the movement of the buffering agents in response to the electric field created by the voltage applied. The device also decreases the distance that the therapeutic agent has to travel to be delivered and prevents the drug from being reduced or oxidized during the process.

The University technology licensing department is suggesting the following advantages:

- Safely delivers macromolecular drugs transdermally without causing significant tissue damage, providing a major competitive advantage over current methods
- Utilizes electrodes with buffering agent, allowing for higher electric current to be applied, enabling transdermal delivery of macromolecules
- Decreases the distance therapeutic agent must travel to reach tissue, reducing time of delivery
- Prevents macromolecular drugs from being reduced or oxidized by electrode, eliminating risk of modifications to drug molecule and unexpected side effects
- Targets advancing field of macromolecular drug therapy, a growing and highly profitable area of medical treatment

What we like about it is the reminder it presents that, just because something was tried a hundred years ago doesn't mean they necessarily got it right a hundred years ago. As ever, 'the field always wins', just that sometimes it takes longer than others.

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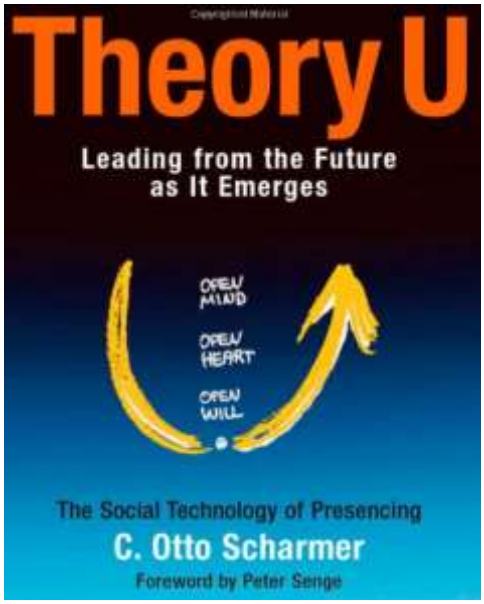
Best of the Month – Theory U



It's not often these days that we get a management textbook built from a lifetime's work. The norm being – ah, how jaded and skeptical we can become – a meaningless 50,000 word inflation of a half-baked idea formed for a magazine article. Author Otto Scharmer's 2009 master-work, Theory U quite literally appears to combine several decade's worth of experience working with some of the world's most accomplished leaders and innovators. More likely than not, however, that might tend to make the output more suitable – or at least 'more actionable' – for ICMM Level 4 and 5 organisations. Which no doubt has the potential to limit the audience somewhat. That said, there is a lot here that we'd all benefit from at least knowing something about.

The book starts from the premise that we live in a time of massive institutional failure, collectively creating results that nobody wants. Climate change. AIDS. Hunger. Poverty. Violence. Terrorism. Destruction of communities, nature, life the foundations of our social, economic, ecological, and spiritual well being. Our crisis-strewn times, according to Scharmer's publicist (I'm not sure he needs it frankly), calls for a new consciousness and a new collective leadership capacity to meet challenges in a more conscious, intentional, and strategic way. The development of such a capacity would allow us to create a future of greater possibilities.

The heart of Scharmer's thesis then comes from his drive to explain why so many of our attempts to deal with the challenges of our time end in failure. Why, he asks, do we find ourselves stuck in so many quagmires? The cause of our collective failure, he surmises, is that we are blind to the deeper dimension of leadership and transformational change. This "blind spot" exists not only in our collective leadership but also in our everyday social interactions. We are blind to the source dimension from which effective leadership and social action come into being. We know a great deal about what leaders do and how they do it. But we know very little about the inner place, the source from which they operate. And it is this source that "Theory U" attempts to explore.

When leaders develop the capacity to come near to that source, they experience the future as if it were "wanting to be born" - an experience called "presencing." That experience often carries with it ideas for meeting challenges and for bringing into being an

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otherwise impossible future. Theory U shows how that capacity for presencing can be developed. Presencing is a journey with five movements:

As the diagram illustrates, we move down one side of the U (connecting us to the world that is outside of our institutional bubble) to the bottom of the U (connecting us to the world that emerges from within) and up the other side of the U (bringing forth the new into the world). On that journey, at the bottom of the U, lies an inner gate that requires us to drop everything that isn't essential. This process of letting-go (of our old ego and self) and letting-come (our highest future possibility: our Self) establishes a subtle connection to a deeper source of knowing. The essence of presencing is that these two selves - our current self and our best future Self - meet at the bottom of the U and begin to listen and resonate with each other. Once a group crosses this threshold, nothing remains the same. Individual members and the group as a whole begin to operate with a heightened level of energy and sense of future possibility. Often they then begin to function as an intentional vehicle for an emerging future.

All in all, while the emerging is quite simple, it contains much that borders on the profound. Which ultimately means t put the thing into practice it’s not going to be simple at all. Don’t think about getting hold of a copy of this book, in other words, unless you’re prepared to put in a few hard yards.

Just in case you’re not sure if you fall in to that category, the journey through the U also stimulates thought about seven ‘essential’ leadership capacities.

1. Holding the space of listening.
The foundational capacity of the U is listening. Listening to others. Listening to oneself. And listening to what emerges from the collective. Effective listening requires the creation of open space in which others can contribute to the whole.

2. Observing.
The capacity to suspend the "voice of judgment" is key to moving from projection to true observation.

3. Sensing.
The preparation for the experience at the bottom of the U - presencing - requires the tuning of three instruments: the open mind, the open heart, and the open will. This opening process is not passive but an active "sensing" together as a group. While an open heart allows us to see a situation from the whole, the open will enables us to begin to act from the emerging whole.

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4. Presencing.
The capacity to connect to the deepest source of self and will allows the future to emerge from the whole rather than from a smaller part or special interest group.

5. Crystalizing.
When a small group of key persons commits itself to the purpose and outcomes of a project, the power of their intention creates an energy field that attracts people, opportunities, and resources that make things happen. This core group functions as a vehicle for the whole to manifest.

6. Prototyping.
Moving down the left side of the U requires the group to open up and deal with the resistance of thought, emotion, and will; moving up the right side requires the integration of thinking, feeling, and will in the context of practical applications and learning by doing.

7. Performing.
A prominent violinist once said that he couldn't simply play his violin in Chartres cathedral; he had to "play" the entire space, what he called the "macro violin," in order to do justice to both the space and the music. Likewise, organizations need to perform at this macro level: they need to convene the right sets of players (frontline people who are connected through the same value chain) and to engage a social technology that allows a multi-stakeholder gathering to shift from debating to co-creating the new.

…which, even if you go no further, is a good list to think about in the context of the six (!?) elements of the Law of System Completeness. Sometimes, it’s good to have a little puzzle to think about… answers next month.

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Conference Report – Ambient Assisted Living

It's official. Conferences make me angry. This year's Ambient Assisted Living Forum was held in Bucharest. Yes, in that really impressive building shown in the photo. The Palace of the Parliament is apparently the second biggest office building on the planet. And probably made from the biggest volume of expensive-looking marble and chandelier crystal. Decadent as it was, that's not what made me angry. That close to 400 clinicians and other healthcare professionals from around the EU were flown in to take part, also didn't make me angry. What made me angry was hearing about all of the money the EU was wasting on trying to create solutions to the ageing population problem. Never have so many seemingly spent so much (of our money) achieving so little. 'More pilots than Ryanair and EasyJet', was the comment of one speaker. Millions of Euros worth of the blighters. Each one presenting a more depressing story than the one before.

Stories of healthcare researchers full of passion for the subject, but not backing it up with any common sense or understanding of the way people think. Or talent.

In any innovation attempt there is likely to be failure, of course. In InnovationWorld it's called 'learning'. The general idea being that you learn from what just happened so that you make progress towards something that is successful. Learning in this respect tends to mean listening to what others have to say. Not a lot of which appeared to be happening at this event. E.g. the only time anyone would be aware of the number of attendees was at one of the (exceptional it has to be said) social events. Back in the hard-work sessions, and it felt a little bit like sitting in a ghost town watching the tumbleweeds roll through.

Other than to see who's been the most successful at extracting money from the EU, the primary motivation of everyone I spoke to seemingly being to make sure they were going to receive a next round of support funding to keep their team going. This was the real reason for attending AAL. The poor old patient was merely the convenient 'good' reason.

Attend more than a couple of events like this and a person might begin to become skeptical that the healthcare sector is placing all of its passion 180 degrees in the wrong direction.

There are ultimately two kinds of angry. Most conferences I attend make me angry in a productive way such that I come away with lots of ideas for future papers and articles. This one was the other kind.

Somewhere on the AAL website (http://www.aalforum.eu/) you might find my tiny voice of protest. I suspect I won't be invited next time.

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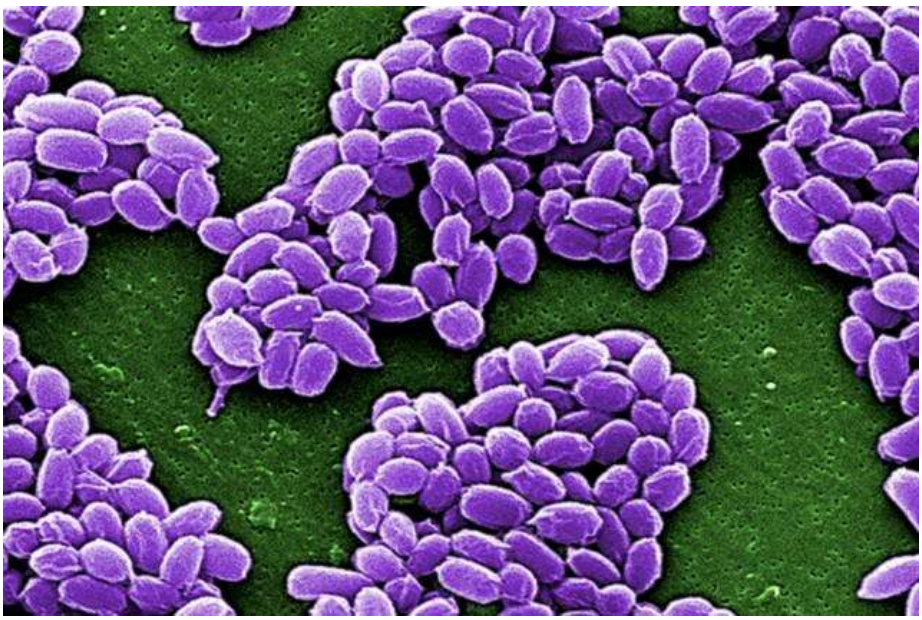
Investments – Good Anthrax



Bacillus anthracis bacteria have very efficient machinery for injecting toxic proteins into cells, leading to the potentially deadly infection known as anthrax. A team of MIT researchers has now hijacked that delivery system for a different purpose: administering cancer drugs.

"Anthrax toxin is a professional at delivering large enzymes into cells," says Bradley Pentelute, the Pfizer-Laubauch Career Development Assistant Professor of Chemistry at MIT. "We wondered if we could render anthrax toxin nontoxic, and use it as a platform to deliver antibody drugs into cells."

In a paper appearing in the journal *ChemBioChem*, Pentelute and colleagues showed that they could use this disarmed version of the anthrax toxin to deliver two proteins known as antibody mimics, which can kill cancer cells by disrupting specific proteins inside the cells. This is the first demonstration of effective delivery of antibody mimics into cells, which could allow researchers to develop new drugs for cancer and many other diseases, says Pentelute, the senior author of the paper.

Hitching a ride

Antibodies -- natural proteins the body produces to bind to foreign invaders -- are a rapidly growing area of pharmaceutical development. Inspired by natural protein interactions, scientists have designed new antibodies that can disrupt proteins such as the HER2 receptor, found on the surfaces of some cancer cells. The resulting drug, Herceptin, has been successfully used to treat breast tumors that overexpress the HER2 receptor.

Several antibody drugs have been developed to target other receptors found on cancer-cell surfaces. However, the potential usefulness of this approach has been limited by the fact that it is very difficult to get proteins inside cells. This means that many potential targets have been "undruggable," Pentelute says.

"Crossing the cell membrane is really challenging," he says. "One of the major bottlenecks in biotechnology is that there really doesn't exist a universal technology to deliver antibodies into cells."

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For inspiration to solve this problem, Pentelute and his colleagues turned to nature. Scientists have been working for decades to understand how anthrax toxins get into cells; recently researchers have started exploring the possibility of mimicking this system to deliver small protein molecules as vaccines.

The anthrax toxin has three major components. One is a protein called protective antigen (PA), which binds to receptors called TEM8 and CMG2 that are found on most mammalian cells. Once PA attaches to the cell, it forms a docking site for two anthrax proteins called lethal factor (LF) and edema factor (EF). These proteins are pumped into the cell through a narrow pore and disrupt cellular processes, often resulting in the cell's death.

However, this system can be made harmless by removing the sections of the LF and EF proteins that are responsible for their toxic activities, leaving behind the sections that allow the proteins to penetrate cells. The MIT team then replaced the toxic regions with antibody mimics, allowing these cargo proteins to catch a ride into cells through the PA channel.

'A prominent advance'

The antibody mimics are based on protein scaffolds that are smaller than antibodies but still maintain structural diversity and can be designed to target different proteins inside a cell. In this study, the researchers successfully targeted several proteins, including Bcr-Abl, which causes chronic myeloid leukemia; cancer cells in which that protein was disrupted underwent programmed cell suicide. The researchers also successfully blocked hRaf-1, a protein that is overactive in many cancers.

"This work represents a prominent advance in the drug-delivery field," says Jennifer Cochran, an associate professor of bioengineering at Stanford University. "Given the efficient protein delivery Pentelute and colleagues achieved with this technology compared to a traditional cell-penetrating peptide, studies to translate these findings to in vivo disease models will be highly anticipated."

The MIT team is now testing this approach to treat tumors in mice and is also working on ways to deliver the antibodies to specific types of cells.

Meanwhile, we all get to reflect on the classical TRIZ idea, ‘even the bad stuff is good stuff’.

More details:

Xiaoli Liao, Amy E. Rabideau, Bradley L. Pentelute. **Delivery of Antibody Mimics into Mammalian Cells via Anthrax Toxin Protective Antigen**. *ChemBioChem*, 2014; DOI: 10.1002/cbic.201402290

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Wow In Music - Tingles

We know that the "wow factor", as we like to call those "highest moments of musical pleasure", is often accompanied by bodily reactions. The fact is that, as much as being a universal language, music has the power to provoke unique personal experiences.
Under the physiological perspective, it is possible to determine some general correlations between music and physical reactions. In an interview to the BBC (http://www.bbc.co.uk/guides/zx6sfg8), for instance, Lawrence Parsons, Professor of Cognitive Neuroscience at the University of Sheffield, explains that, even though, sadder music can produce more chills than happy music, that is subject to the individual enjoyment each one of us have in relation to specific music. The idea is that, if I don't like a given music, it is probably not going to produce a chill effect on me.
Not only our psyche but also our entire body gets involved while we are listening to music. As a survey conducted by the BBC (same webpage) shows, an overwhelming majority reported to have experienced the so-called "tingle factor", which is accompanied by changes in skin conductance, heart rate, body temperature, and breathing.
The neurological processes involved with the tingle factor occur in a number of "old centres" as Professor Parsons explains: "the centres of the brain that are involved with reward, motivation, planning, emotion, all of those centres get involved, including visceral; the senses you have of how your body feels". Some of these centres include the insula (association with aesthetic impressions), the caudate nucleus and nucleus accumbens (rewarding), amygdala (arousal induction), prefrontal cortex (ongoing goals) and the anterior singulate cortex (interaction of emotions, reward and cognitive processes).
According to Professor Parsons, this phenomenon "could go back to early days of language development (...) to early days of sort of cultural exchange, where the members of a group would come together and tell stories about the hunt, about the day's activities. Stories about the forest gods, whatever cultural (...), entities they believed in, and they used that as a sort of dramatic dance music combination where all the members of the group are involved at some level. And these large social organisation experiences tuned everyone's emotion in the group together, binds everybody together, infants to babies to all members from the oldest to the youngest member of the group".

Moreover, aren't we always connecting with other people, even when we listen to music alone, with our earphones?

(Next time you get one of those musical tingle moments, let us know what it was… we'd love to build them into our PanGenic database… which hopefully then allows us, some time in the future, to generatively compose 'tingles')

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Generational Cycles – PMRC

Back in 1985, Tipper Gore, wife of Senator Al Gore was horrified when she found herself listening to some of the lyrics on the Prince album she'd just purchased for her 11 year old daughter. The lyrics in Darling Nikki were quite likely not the sort of thing you'd want any 11 year old to listen to. Except for the probable fact that an 11 year old would have no idea what mommy was so shocked about. Clearly, in Tipper's ears, though, something had to be done. So she rallied some of her big shot Washington friends and set up the Parents Music Resource Center (PMRC). Despite protestations from assorted music industry representatives, including John Denver (wow – if you made John Denver angry, you really were doing something special!), the PMRC found themselves with enough government support that every piece of music with content deemed to be adult in content would have to be stickered with a parental warning. One of these:

Somewhat amusingly, looking back to 1985 from where we are today, the PMRC also saw fit to publish a 'filthy fifteen' – the fifteen songs they deemed to be the most hazardous to the emotional well-being of American teens. Here's the list they came up with:

#	**Artist**	**Song title**	**Lyrical content**
1	Prince	"Darling Nikki"	Sex/Masturbation
2	Sheena Easton	"Sugar Walls"	Sex
3	Judas Priest	"Eat Me Alive"	Sex
4	Vanity	"Strap On 'Robbie Baby'"	Sex
5	Mötley Crüe	"Bastard"	Violence/Language
6	AC/DC	"Let Me Put My Love into You"	Sex
7	Twisted Sister	"We're Not Gonna Take It"	Violence
8	Madonna	"Dress You Up"	Sex
9	W.A.S.P.	"Animal (Fuck Like a Beast)"	Sex/Language
10	Def Leppard	"High 'n' Dry (Saturday Night)"	Drug and alcohol use
11	Mercyful Fate	"Into the Coven"	Occult
12	Black Sabbath	"Trashed"	Drug and alcohol use
13	Mary Jane Girls	"In My House"	Sex
14	Venom	"Possessed"	Occult
15	Cyndi Lauper	"She Bop"	Sex/Masturbation

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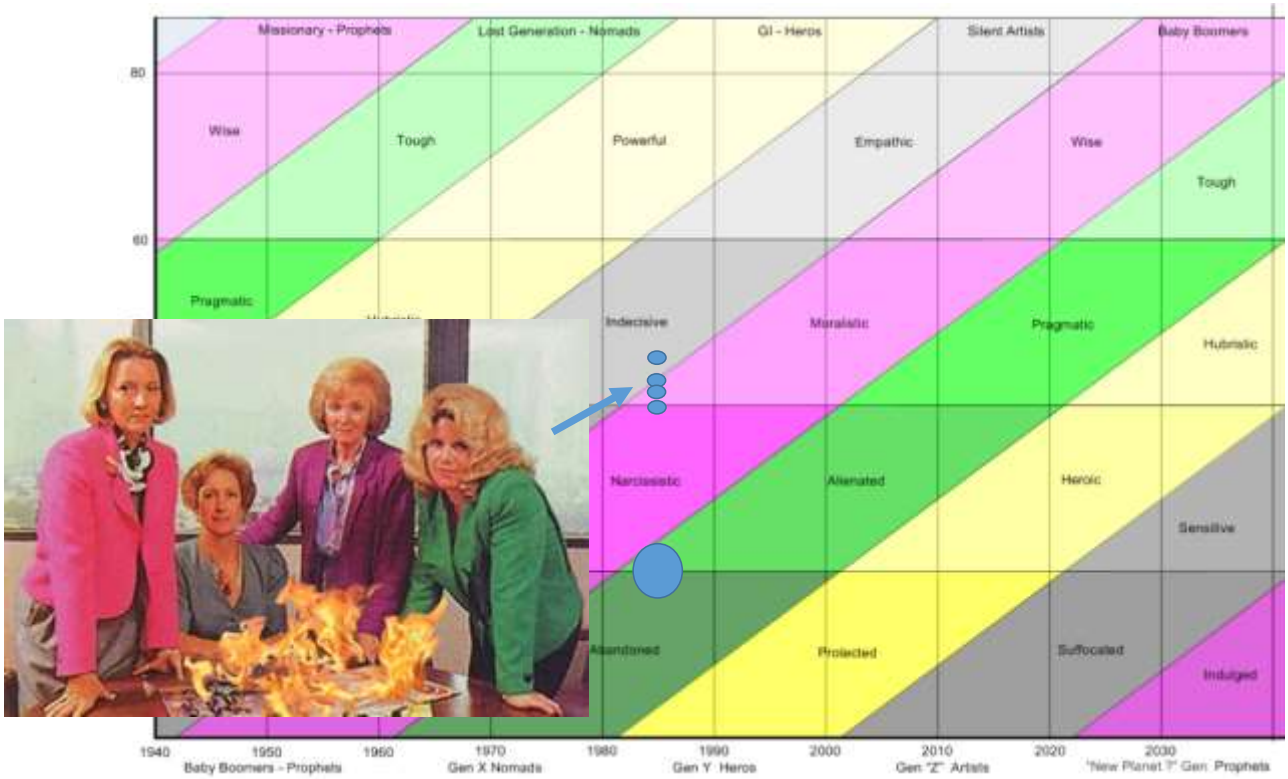
I say ‘amusingly’ because all fifteen went on to sell a shedload more records after their products had the parental warning stickers applied than before. The artists concerned were, put simply, laughing all the way to the bank. Which in turn meant that every other artist on the planet, also keen to laughingly shovel free bonus money in to their own bank accounts, sought to achieve a similar sticker on their next piece of product.

To say that Tipper Gore’s initiative had the exact opposite effect of the one she and her three co-conspirators had in mind was just about the understatement of 20th Century popular culture. The stupid thing is, if the four permed-musketeers had drawn this picture, they might well have had second thoughts about their strategy:



What we see here are four Baby Boomers (actually, in fairness to Susan Baker, who was a bit older than the other three, ‘three Boomers and an in-decisive Silent’) just entering the ‘Moralistic’ phase of their lives. Moralists who – naturally – couldn’t let things they perceived to be bad continue without some kind of response. Like, for example, burning Sheena Easton records… although, notice in the picture their flagrant flouting of fire safety regulations… that’s an expensive mahogany table, ladies.

The problem was, when Moralists tell Alienated music purchasers (or musicians) what not to do, the only thing that’s guaranteed is they’re going to do it even more. To the extent that 25 years later the Parental Advisory sticker was still a great way of selling more records.

If they’d’ve been a lot smarter than they were, they might well have saved the idea up ‘til somewhere early in the next decade, when the new generation of Sensitive Artists hit the music buying scene.

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Biology – Oilbird

What dwells in caves, has dolphin-like sonar, navigates like a bat, has eyes like a deep-sea fish, can hover like a kingfisher, finds its food by smell and can be boiled up to make oil?

A bird of course—but no ordinary bird. It's the unique and intriguing oilbird (or Guacharo) of Central and northern South America—the only nocturnal, fruit-eating bird in the world. The great German explorer, Alexander von Humboldt, first drew attention to these bizarre birds. He observed oilbirds in a Venezuelan cave in 1799 and described them in the report of his travels a few years later.

Natives of South America call the oilbird 'Guáchart'—Spanish for 'One who cries/laments' and another name is 'Diablotin'. The scientific name is *Steatornis caripensis* and this single species is placed in a family all of its own, Steatornithidae, highlighting just how unusual it really is.

During the daytime, oilbirds roost on cave ledges, digesting food eaten the previous night. While most other bird species roost at night and are active during the day, at night oilbirds show their true colours. They are one of only two types of birds that can navigate in the dark using a unique echolocation system—the other being the cave swiftlets of forest caves in South Asia.

What we have here is a classic example of 'someone, somewhere already solved your problem'. Or rather different strands of nature hitting upon the same basic solution to the same problem. In this case the conflict between the desire to productively feed at night (when no-one else is around to steal your favourite fruit) and the inability to see:

IMPROVING PARAMETERS YOU HAVE SELECTED:

Productivity (44)

WORSENING PARAMETERS YOU HAVE SELECTED:

Ability to Detect/Measure (49)

SUGGESTED INVENTIVE PRINCIPLES:

4, 32, 37, 25, 28, 18, 35, 24, 13

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…where the answer becomes a (Principle 28) sonar system. Just like bats (and many sea mammals), they emit clicking calls in rapid succession and listen to the returning echoes. This means that, in the pitch blackness of their cave home, they can fly around without bumping into the cave walls or each other. At dusk, they leave the cave to find food and their echolocation system works together with their keen smell and super-sensitive vision, helping them to snatch nuts and small fruits in mid-flight without needing to land. In fact it is thought that they never perch during foraging trips, using instead their ability to hover while feeding.

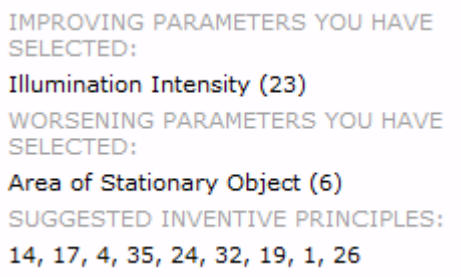
Oilbirds only eat fruit (i.e. they are frugivores), which they locate by smell. They are partial to figs and palm nuts, but a population in Trinidad has been observed eating more than 36 different fruits. Like fruit bats, they are responsible for 'planting' new fruit trees far and wide as seeds, inside the fruits, pass through their guts and often get dropped at a considerable distance from the host tree—oilbirds may range up to 240 km (150 miles) in a single night.

Oilbirds feed their young exclusively on fruit pulp. This is very unusual because an all-fruit diet would not normally provide adequate nutrition for baby birds. Oilbird nestlings retain food in their intestines for longer than normal, enabling them to extract all the nutrients which they need in order to thrive on fruit. For instance, they are able to extract 80% of the lipids (fats) from their diet.

The eyes of oilbirds are highly specialized for their unique lifestyle. While not apparently designed for distinguishing colour, it has recently been discovered that they are extraordinarily sensitive to light—a great advantage to a bird that 'breaks all the rules' by being nocturnal. This incredible light-sensitivity is achieved by each of the oilbird's eyes having a large pupil (enabling them to gather the maximum amount of light) and millions of densely packed rods, the photoreceptor cells.

In early 2004 there was a flurry of articles in the scientific press, reporting that researchers had discovered some astounding things about the eyes of oilbirds. Using microscopy, they found that each rod (photoreceptor cell) in an oilbird's highly light-sensitive retina is unusually tiny, only 1.3µm in diameter by 18.6µm long. Furthermore, the rods are stacked up in (Principle 17) three banks/tiers (an arrangement that has only previously be seen in deep-sea fish) so that the density achieved is 1 million rods per sq. mm, higher than is known in *any* other vertebrate eye. In contrast, only a small number of cone photoreceptor cells (for discerning colour) is present. Although small, an oilbird's eye nevertheless has 'a light-gathering capacity that is the highest recorded in a bird', due to a pupil that can enlarge to 9 mm in diameter. These unique eye features make oilbirds *extremely sensitive* to low light levels and, in tandem with their other senses (smell and echolocation) demonstrate the oilbird's supreme design for a nocturnal lifestyle.

Here's what that problem looks like when mapped on to the Contradiction Matrix:



All in all, something of an all-around record-breaker. If there can be such a thing.

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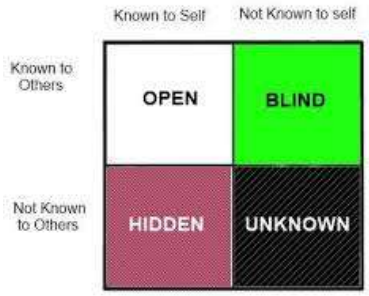
Short Thort

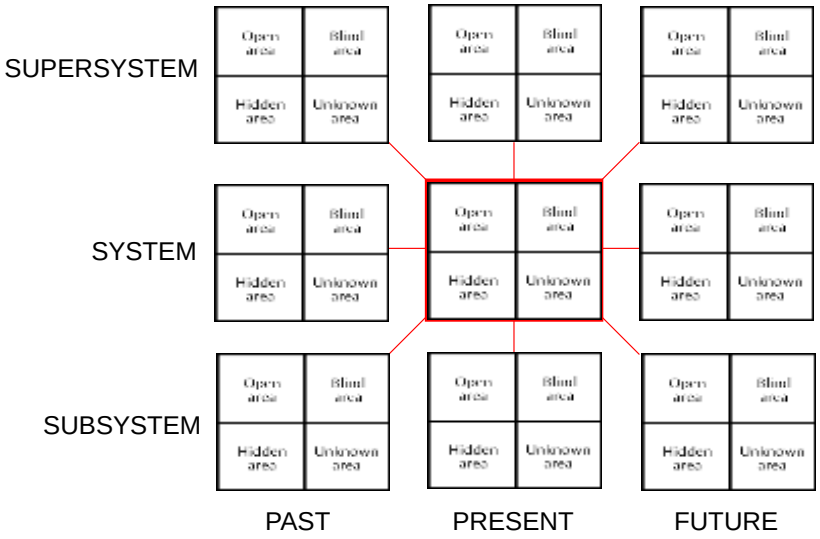
"Man knows himself only to the extent that he knows the world;
he becomes aware of himself only within the world,
and aware of the world only within himself.
Every object, well contemplated, opens up a new organ of perception within us."
Johann Wolfgang v. Goethe

Well contemplated:

Johari Window



9 Johari Windows



News

IMechE

We are very happy to announce that we will be working with Enabling Maximum Potential to deliver all future TRIZ and Systematic Innovation education for the Institution of Mechanical Engineers in the UK. The public events kick off with a one day session on 29 October. There will likely then be three or four public events during 2015. The relationship also includes any number of in-house programmes, the first of which have already begun. Billed as '21st Century TRIZ' interested parties will be able to book course places through the IMechE site: http://www.imeche.org/learning-and-development/courses/engineering-essentials/introduction-to-triz

Swansea University

Darrell will be giving a presentation at the University's 'Knowledge Exchange Wales' annual showcase forum on November 26. More details at: http://www.eventbrite.com/e/swansea-university-knowledge-exchange-wales-kew-network-annual-showcase-event-accelerating-business-tickets-13224447679

Rail Industry Association

We will be presenting a plenary session and break-out workshop at the next RIA 'Unlocking Innovation' session, being held in Coventry on 9 October. Previous events

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have been fully subscribed at around 180 participants. Anyone wishing to join the throng should check the RIA website to see if there are any places left.

PanSensics Australia
We will be conducting a number of webinars and seminars on the PanSensic toolkit during our trip to Australia during the week 20-27 October. More details on the website diary page.

India In December
Darrell's next trip to India will take place during the week 15-20 December. The 17th, 18th and 19th have already been allocated to clients. Which leaves 15, 16 and potentially the 20th available if any ezine readers in that part of the world would like to consider workshops or project activities.

Building Society Association
Darrell will be 'Making Sense Of The Confusion' at the UK's biggest Building Society get together, this year taking place in Stratford-upon-Avon on 28 November. The two day conference – intriguingly titled, 'As Good As It Gets?' – is attended by the CEOs and direct reports of all 48 of the UKs Building Societies, so it should be a source of lots of lively debate.

New Projects
This month's new projects from around the Network:

Construction – Fuzzy-Front-End strategic study
FMCG - PanSensic-driven opportunity-finding project
FMCG – PanSensic consumer journey mapping study
Automotive – SI certification workshop series
Healthcare – Strategic study
Pharma – technical problem solving workshops
Healthcare – PanSensic-driven dashboard
Food – consumer perception analysis and strategy definition study

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