# Systematic Innovation

# e-zine

Issue 136, July 2013

In this month's issue:



The Systematic Innovation e-zine is a monthly, subscription only, publication. Each month will feature articles and features aimed at advancing the state of the art in TRIZ and related problem solving methodologies.

Our guarantee to the subscriber is that the material featured in the e-zine will not be published elsewhere for a period of at least 6 months after a new issue is released.

Readers' comments and inputs are always welcome.
Send them to **darrell.mann@systematic-innovation.com**

# Regulatory Contradictions

If I received a pound/dollar/rupee every time someone in a problem solving workshop told me it wasn't possible to contemplate new ideas because they would contravene Regulations, I could probably have retired about a decade ago. If I'd received another dollar every time this kind of statement was followed up with a (usually gory) description of how their industry was uniquely and aggressively Regulated – also with a capital R - I could've retired two decades ago.

Innovation in healthcare is uniquely prevented by Regulation. In precisely the same unique ways it is in aerospace, pharmaceuticals, public utilities, oil & gas, construction, and just about every domain of human endeavor on the planet where there is a likelihood that the welfare of a customer or public at large is under some kind of threat. Which is all to say that Regulations create precisely the same 'unique' contradictions everywhere they exist.

Does the existence of Regulation in all of these industries mean that no one in a Regulated industry ever innovates? Or does it rather mean that some industries use Regulation as an excuse to not innovate more than others?

All this pre-amble is not to try and say that Regulation related contradictions are easy to solve necessarily. Rather that, because they are 'merely' a contradiction, the Contradiction Matrix should help direct us to the solutions that those brave souls that successfully solved the Regulation challenge managed to use. Figure 1 illustrates how we might generically look to map a typical Regulate/Don't-Regulate contradiction:

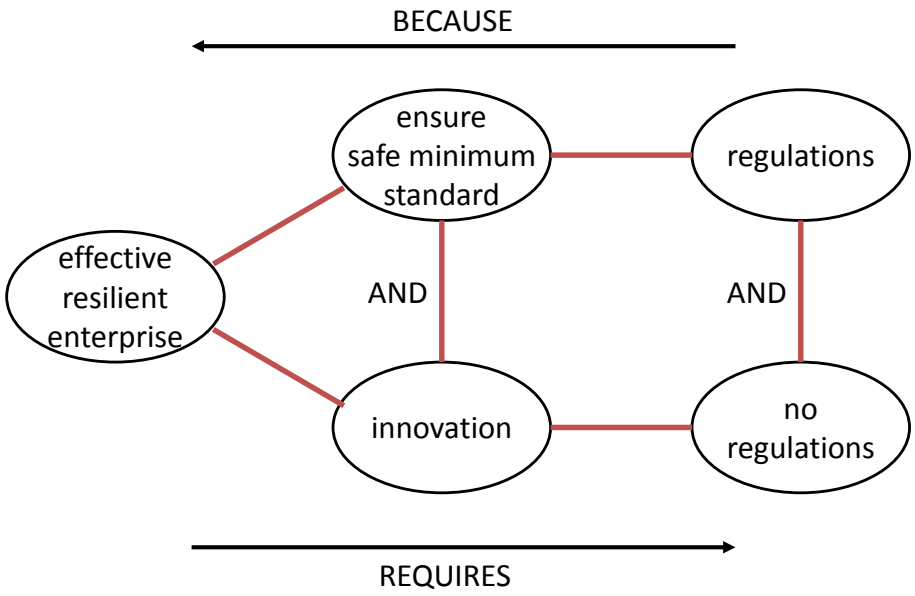



**Figure 1: We Want Regulation And We Don't Want Regulation**

That said, of course, one of the real issues in the problem solving sessions where the Regulation issue is likely to rear its ill-formed head – bearing in mind the old J.P.Morgan axiom, 'people do things for good reasons and real reasons' – is that when a person says 'we can't challenge Regulations', what they actually mean is, 'challenging Regulations is above my pay grade'. Which, on the one hand, it probably is, but on the other, still shouldn't be justification for killing off any and all solution ideas that apparently don't meet Regulatory requirements.

If we look at the Figure 1 contradiction from the other side, Regulators, for the most part, have no intention to prevent innovation. Their job as Regulator is to ensure the safety of the sector of society within their zone of control. They know as well as any problem solver that ensuring safety is not incompatible with 'doing a better job for' the exact same group of society they're tasked with looking after. In other words, for the most part, the Regulator is on the same side as the problem solver.

This fact might not always, however, fit with the general perception held by the problem solver. An important part of this disconnect, where and when it happens, is that for one reason or another, one or other party has opted to create a distinct separation distance. Trying to close this – as has happened in the aerospace industry, where everyone (Regulator, company, competitors) is very much on the same side in a battle to improve safety – is step one to a generically applicable solution.

A bigger problem exists however, even if the communication between Regulator and innovator is extremely good. We might think of this problem as 'regulation-creep'. As the name suggests, it is an often insidious and difficult to track down problem. Its trajectory typically looks something like this:

1) Industry and regulators sit together and over time agree some workable protocols
2) Industry seeks to make an improvement to their products or services, and so discusses with the Regulators (and, if they're smart, competitors) how best to evolve the Regulations. The Regulations evolve. Possibly quite quickly at first, and then more slowly.
3) Over time, people in industry and at the Regulatory body change. The new people don't understand the history behind why the regulations look the way they do. Which then translates to new-designers seeing the Regulations as overly restrictive, and the new-Regulators to stick more and more to the letter as opposed to spirit of what's been written and agreed previously.
4) The number of Regulations and the restrictions they provide become progressively more exacting. Because fewer and fewer people understand the Regulations from first principles, there comes a growing tendency, whenever someone dreams up some new idea, or – heaven forbid – something is perceived to go wrong to write more and more sub-clauses and conditional exceptions. Regulators start regulating to cover the details of specific solutions rather than the intended outcomes.
5) The complexity of the Regulations increases and increases until no-one in either industry or at the Regulator understands them anymore. The Regulations fill several filing cabinets that no-one has the time, inclination or ability to read.
6) Either something goes horribly wrong or a brave new person arrives on the scene (usually on the Regulator side of the fence), such that it becomes apparent that the reason things aren't working any more is because no-one understands the system.
7) The brave person instigates a re-think of the Regulations, working with industry again to get back to first principles and to strip out all of the superfluous, non-value adding complexity.
8) The cycle begins again.

In other words, if you look at the amount of Regulation within an industry, you can usually observe a pattern looking something like the saw-tooth-pulsed graph shown in Figure 2.

There are no general rules regarding what the pulse-time of the cycle is. All we know is that the saw-tooth characteristic is the aspect that is generic. In the pharmaceutical industry, there is evidence to suggest that the creep-re-datum period is typically equivalent to the life of important drug patents. In more general 'government' situations – e.g.

defining the ‘laws of the land’, most countries have laws still on their statutes that were to all intents and purposes redundant, unenforceable and frankly silly (in the UK, it is still an act of treason to place a postage stamp bearing the British monarch upside-down on a letter) over a hundred years ago.

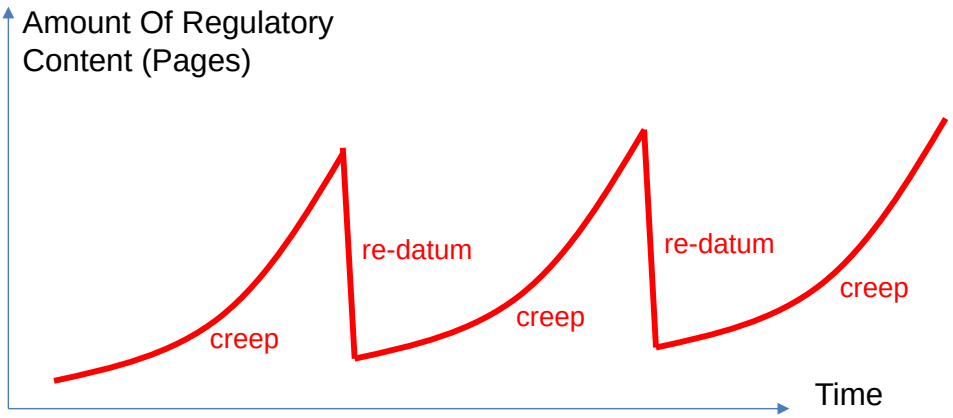



**Figure 2: Typical Amount Of Regulation (Pages) As A Function Of Time**

So why is this characteristic important? Answer: because knowing where your industry is along the cycle is a good first clue as to how best to solve the contradiction: At the start of each cycle – i.e. after a re-datuming to clear out the specifics and get back to the desired outcomes – the most likely strategy will be quite different to times when the cycle has seen more than its fair share of creep.

There are lots of dependencies in either case, but if we stick with general principles in this article, these seem to be strategies that tend to work:

**Re-Datum Period**
The shift from specific solutions (one I’ve been subjected to recently: ‘the appliance must be positioned at least 800mm from the wall, and there must be 0.1m2 of ventilation provided’) to the actual intended outcome (‘make sure the appliance is far enough away from the wall to prevent a fire hazard, and that there is sufficient airflow to prevent incomplete combustion’) is highly consistent with the evolution directions the TRIZ/SI will be recommending anyway (‘the customer wants the function’). Help the Regulator to reformulate Regulations according to the ‘it’s all about the outcomes’ and ‘increasing ideality (more benefits, less cost, less harm)’ heuristic. Regulating for outcomes means the Regulator has to write less words, and the designers are able to think harder about the innovative solutions they develop. It also means that it is far easier to get competitors to agree to the new Regulations since they focus everyone on the real problem rather than outdoing one another’s incremental solutions. As a general rule, the way to get two or more parties to agree on something is to provide them with a ‘common enemy’. What re-datuming periods do is make the end-result outcome the common enemy.

**Regulation-Creep Period**
The Regulator knows during a period of re-datuming that they are obliged to consult with industry. Prior to that realization, when Regulators have begun to lose track of why the Regulations they administer are the way they are, this is the period during which separation between industry and Regulators is likely to be at its greatest and each party most likely to be in a defensive, ‘I’m right, you’re wrong’ frame of mind. Again the best solution strategy is the ‘common enemy’ approach, only now the enemy is more difficult to pin down. Most frequently, in recent years, it has become other geographic regions. As in,

‘if we don’t re-write the Regulations here, we will be unable to compete in other markets where the Regulations are more relaxed’. Or, put the other way around, what some industries are increasingly tending to do is shift their early R&D to regions where the level of Regulation is less. Not that this means that full Regulatory compliance won’t be sought at some point in the future, merely that since innovation is fundamentally about challenging assumptions, start it in places where the Regulatory assumptions are fewest.

That’s okay if you’re a project manager in a large MNC, but it doesn’t necessarily help the small companies or the local R&D team that happen to find themselves in a position where shifting the location of the work effectively puts them out of a job. In either of these situation the generic needs to give way to the specific…

…which in turn means thinking about what specifically is in conflict with what? What are we trying to achieve and what aspect of Regulation is it that we perceive is stopping us?

Here’s where this kind of article becomes difficult: how to write something generically relevant when different cases might be very different from one another. How to solve that contradiction?

Let’s try this: the generic strategy is to use one of the Contradiction Matrix tools. The SI research team sees Regulation-oriented conflicts and contradictions all the time, and whenever we see a good solution, we put the ‘answer’ into at least one of the Matrices. We can thus tap in to the good solutions of others by formulating either or both of a technical or business problem. Which is to say that a Regulation problem can be solved as either a technical, business or combination of both problem.

So much for the generic: ‘use the Matrix’!

Let’s try a couple of more specific situations:

Take the example of the earlier Regulation, ‘the appliance must be positioned at least 800mm from the wall’. If this was the actual Regulation and I didn’t want the appliance sticking out into my room by 800mm because it would look ugly, I might look to tackle the problem as the conflict pair reproduced in Figure 3:

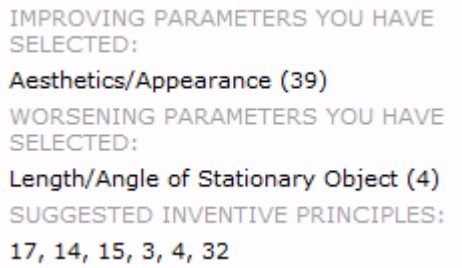



**Figure3: Mapping The 800mm Minimum Distance Regulation Problem**

What the Matrix tells me is I’m not the only person in the world who’s had this problem. Others have solved it by, for example, having the appliance movable (Principle 15) such that it is 800mm from the wall when it is switched on, and next to the wall and out of the way when it is not. Or, maybe I curve the walls around the appliance to make it look like its closer? Or use a colour effect (e.g. mirroring) to make the distance seem smaller (Principle 32). Not to mention – more pragmatically from an engineering point of view, even though it wouldn’t solve the strict 800mm Regulation, change the emissivity properties of the appliance such that it radiated less heat in the direction of the wall.

The point here being that a mere (stupid in this case) Regulation needn't stop me from achieving what I want *as well as* complying with the Regulation.

Finally let's look at the Regulation problem from a more business focused perspective. Again, it's difficult to say anything meaningful here without being specific, so let's take the (hypothetical) situation in which we're trying to do a piece of R&D and the Regulation we are hitting up against concerns how we go on to safely produce and commercialise the solution. Figure 4 illustrates how we might best map this problem onto the Business version of the Matrix:

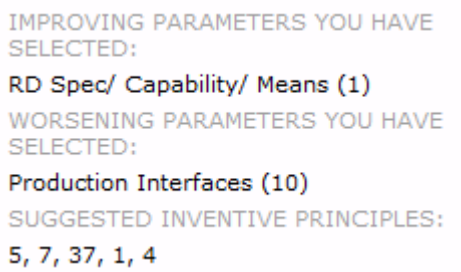



**Figure 4: Mapping The R&D Versus Production Regulation Restriction Conflict**
(note how we typically use 'Interface' parameters to tap in to Regulation-based conflicts)

Now, again, we have a cluster of generic strategies that others have used to resolve similar issues:

- We can Merge (Principle 5) or nest within (Principle 7) with another production process that already has Regulatory compliance
- We can demonstrate compliance by proving the Relative Change (Principle 37) to a proven, accepted solution, is fully mapped
- We could segment (Principle 1) the problem – don't try and comply with every (geographic) Regulation right from the beginning, rather match the compliance to different stages of the innovation journey (in exactly the same way that no development programme attempts to mitigate every risk in one go during the development cycle)
- We could put all of the R&D in a safe, isolated Skunkworks, away from all of the safety-first production activities (Principle 1)
- Create 'safe to fail' experiments (Principle 4) – that allow learning to take place long before there is the potential to affect the safety of anyone in the outside world.

Again, the point being that, in classic, 'someone somewhere solved your problem' fashion, whatever you think your Regulatory problem is, someone, somewhere already solved that too. All you need to do is contemplate that fact and in a lot of cases the problem turns out to be much closer to perception than reality. The only time we allow Regulation to stop us from creating more Ideal solutions is the time we stop ourselves from thinking creatively. Regulations are not bad. They are not intended to impede innovation. They are merely the safety boundaries that should (rightly) separate the pioneering research from the fully validated production of the finished entity.

# Pillars, Processes & Car-Parks

A question from a recent workshop: ‘what’s the relationship between the Systematic Innovation pillars and the various tools and processes that exist in and around the method?’ It was one of those questions where first thoughts tell you the answer is obvious, but then the more you think about it, the less obvious everything seems to become.

The obvious answer first of all: the basic idea behind the pillars (Figure 1), as we typically find ourselves quoting, is ‘things that should be in your conscious mind all the time that you are using the tools’.

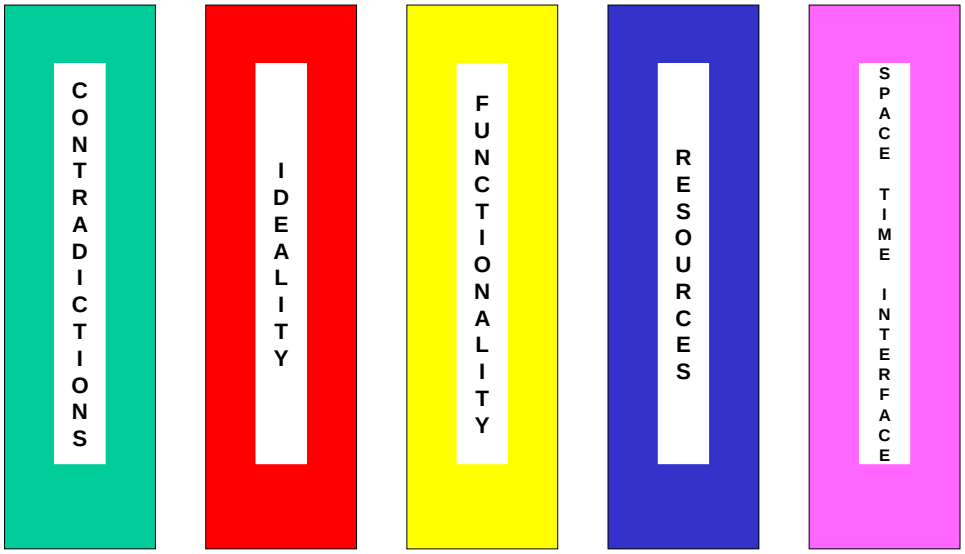



**Figure 1: The Five Pillars Of (Technical) SI**

Simple to say in practice, but not quite so easy to apply. At least that’s what I still find, twenty years after I first started using TRIZ. Hence this attempt to add a little bit more structure to the simple idea: the result of me trying to unpick the now largely unconscious processes that - I think - are happening inside my head.

Given that I spend a lot of time working with groups that have typically had less than full exposure to all of the various different tools and processes in the SI toolkit, on our workshops these days we tend to build an on-the-fly process using the tools that we’ve learned during the workshop. One of the main aims of doing this is to try and demonstrate to people that what might have looked like a random array of tools somehow form a coherent whole. Figure 2 shows a typical process as might emerge from a two-day workshop.

The basic idea behind the process is to provide a rough overall structure to a person that has perhaps never seen the tools before. Once people have become accustomed to the process (magic number still seems to be three – force yourself to go through it three times and it starts to become a natural way of thinking), the word ‘rough’ is intended to imply that people should feel free to adapt and alter the basic framework to suit their personal style of doing things, or the types of problem they tend to spend most of their time working on. If a person, for example, decides that they love the Evolution Potential, Trends tool, they might choose to insert it at the beginning of the process. Or if they dislike the ‘Why/What’s-Stopping?’ template they might find an alternative, or delete it from their version of the

process altogether. Whatever the specifics, the general idea is that we can all develop our own preferred way of working through a problem.

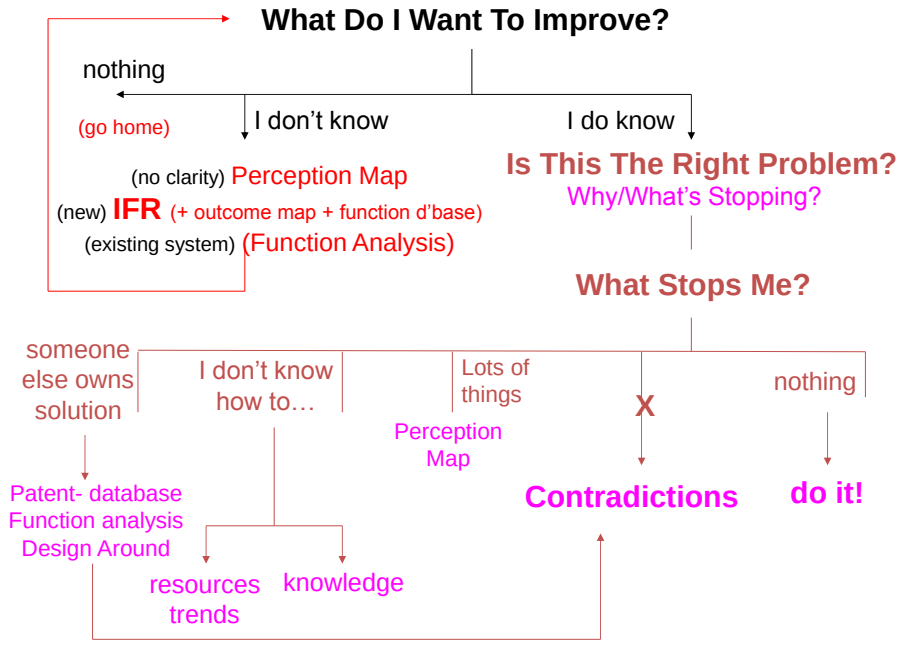



**Figure 2: Typical SI Process Map**

So, now, how does this process connect to the idea of 'always keeping the pillars in your mind'?

The Figure 2 process starts with the simple first question, 'what do I want to improve?' If we're thinking about that question and we simultaneously 'always keep the pillars in our mind', that should imply that as we think about our situation and what it is we're trying to improve, we should, at the same time be thinking about what Functions we're trying to achieve, what Ideality looks like, what Resources we might have available, what Contradictions we might already be able to see and how best to orient our Space/Time/Interface (STI) perspectives on the situation. In effect we're trying to create a situation like the image shown in Figure 3:

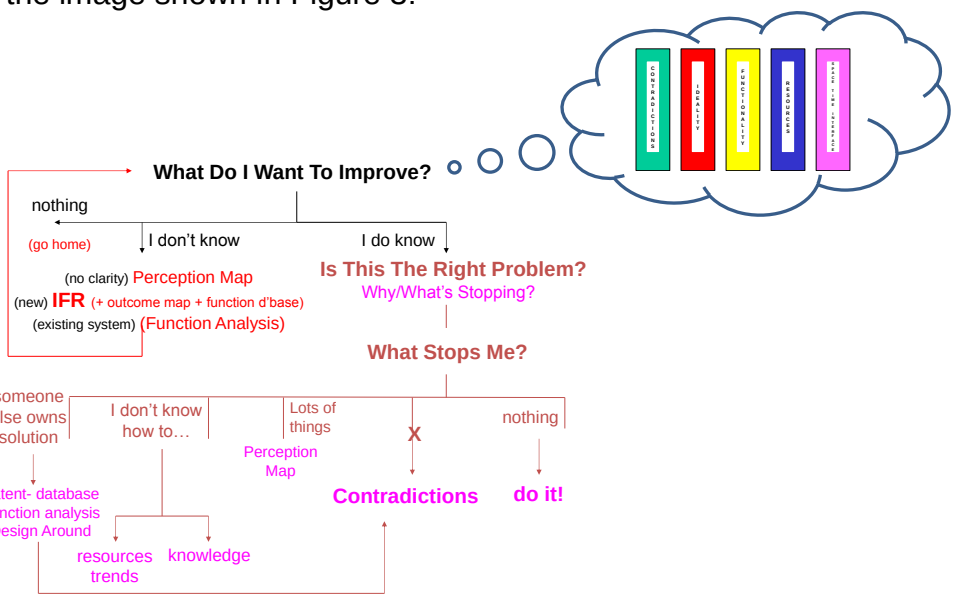



**Figure 3: Possible Single-Step Breakthrough Solution Strategy**

In theory, if we accept that our short term memory can only hold seven (plus or minus two) things at any one time, simultaneously thinking about what we're trying to improve and the five pillars is possible. Whether we can do it well is another matter… the usual problem being that, the brain being in effect an enormous connection-making machine, we can very quickly find ourselves sparking all sorts of random thoughts even by just thinking about any pair of things on our list.

While this might not in actual fact be such a bad thing, it usually doesn't feel like we're using a 'systematic' process. Which in turn can make people perceive – wrongly as it turns out, but, hey, perception is reality, right? – that they might as well just stick to their previous random ways of solving problems.

For those people, one of the possible remedies is to quickly pass sequentially through each of the pillars and in effect use them as a check-list that we can tick when we think we understand what each is trying to say to us.

And if that still sounds too random, it's also worth contemplating which of the pillars might be more important than another. The fact that they're 'pillars' says, of course, that they're all important, but that fact needn't preclude the possibility that at any given moment in the process one isn't more useful than others. Figure 4 makes an attempt to prioritise the various pillars when we're at the 'what do I want to improve?' stage:

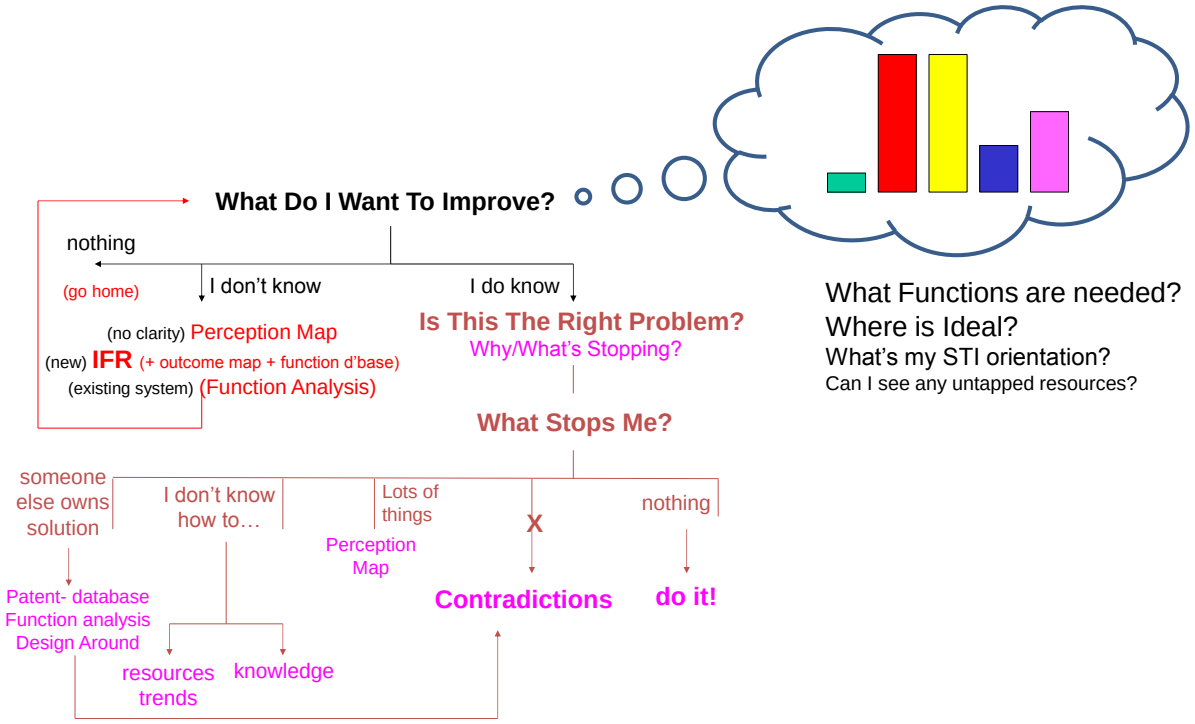



**Figure 4: Prioritising Pillars At The Initial Process Stage**

Thinking about the pillars and what-to-improve question sequentially or trying to mash everything up together is likely to throw out several random thoughts and questions. It's very easy to lose these things and, random as they might be, there is often a lot to be said for 'first thought; best thought'. Which is to say, probably not a good idea to lose these thoughts.

This is where we typically create some form of 'car-park' – a place (whiteboard, flip-chart or equivalent, typically) for random thoughts to be written down so they don't get lost. The main idea behind car-parks, is that we can place things in them or take them out as we wish, all the time safe in the knowledge that, a) they aren't lost, and b) that even though

our trips to and from the car-park might be random, we always have a specific place in a process we can come back to. That's the part where structure and randomness are allowed to co-exist.

One modification to the car-park idea we've recently taken to introducing is to divide the car-park into three segments – one part for solution clues, another for thoughts about what the actual problem might be, and a third part where we identify the 'not sure's or 'things we don't know'. Figure 5 illustrates the basic concept:

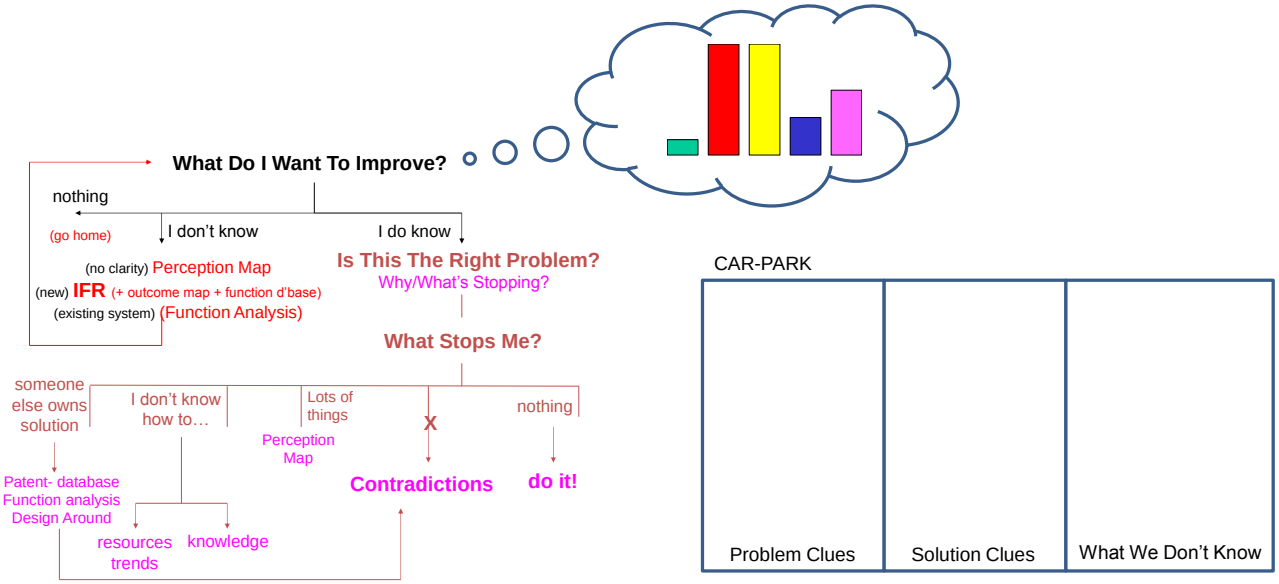



**Figure 5: Pillars, Processes & Car-Parks**

That's pretty much it as far as any kind of theory connecting the three pieces is concerned. All that basically happens from here is that as we progress through the process, the bias of our consciousness of the pillars may well change. The following table summarises how this author attempts to distribute consciousness between the pillars for each of the different tools in the process:

| Tool | Contradiction | Ideality | Functionality | Resources | STI |
|---|---|---|---|---|---|
| Perception Map | 10 | 10 | 20 | 30 | 30 |
| IFR/outcome map | 20 | 20 | 20 | 20 | 20 |
| Function Analysis | 20 | 5 | 40 | 5 | 30 |
| Why/What's Stopping | 30 | 10 | 10 | 10 | 40 |
| Contradictions | 30 | 5 | 5 | 30 | 30 |
| Trends | 5 | 5 | 20 | 20 | 50 |
| Knowledge | 30 | 20 | 30 | 10 | 10 |
| Resources (9-windows) | 20 | 30 | 10 | 30 | 10 |
| Patent Database | 20 | 20 | 30 | 20 | 10 |

The big danger with any kind of table like this is it can give the impression of being prescriptive. That definitely isn't the intention. The main aim, rather, is to offer some kind of protocol showing how the processes and pillars come together, and, to re-plant the seed that, ultimately, all of this stuff is supposed to adapt to you rather than the other way around. In other words, find a combination and way of doing things that works for you.

Oh, and don't forget to take a peak in the car-park once in a while.

**Not So Funny – Another (Ad) Dimension**

The definition of mixed feelings: you spend a lot of money with an advertising agency to come up with a beautiful advertising image and then someone comes along and subverts it. On the one hand when someone spoofs you, it's a great compliment that your efforts were worthy of copy ('imitation is the sincerest form of flattery', etc) and keeps your image in the minds of the public, on the other, the subvertisement occasionally has the power to completely supplant your idea and thus destroy the image you wished to convey.

Apple (boy, the world really has it in for you right now!) has become a great target in recent months:


Oops.


A personal favourite, this time – unusually – from VW, who managed to find a very elegant Another Dimension take on an earlier Nissan ad:

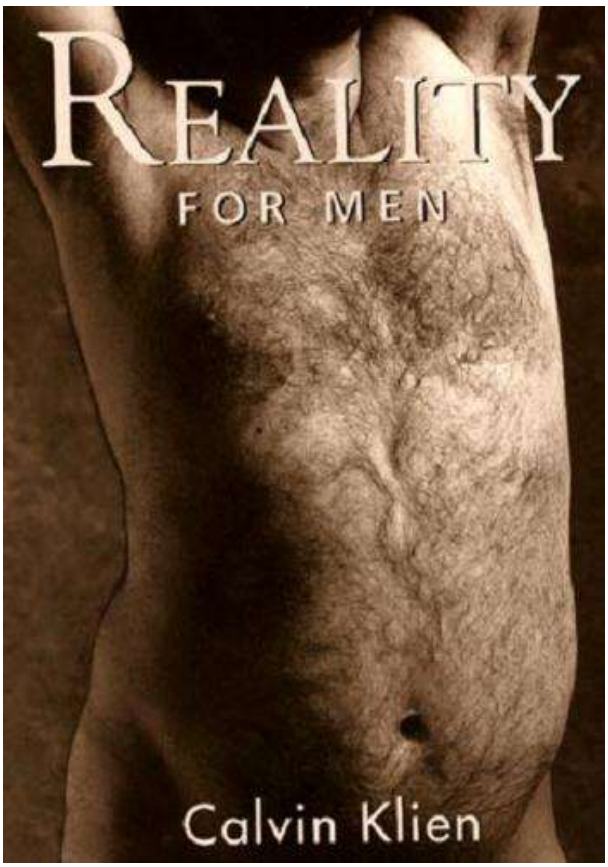

More iconic than the icon?
Definitely another Another Dimension!




SYSTEM
ATIC
INNOVAT
ION

Even better than the real thing?


And finally, hopefully not while you're eating your lunch…



**Patent of the Month – On-Chip Antennas**

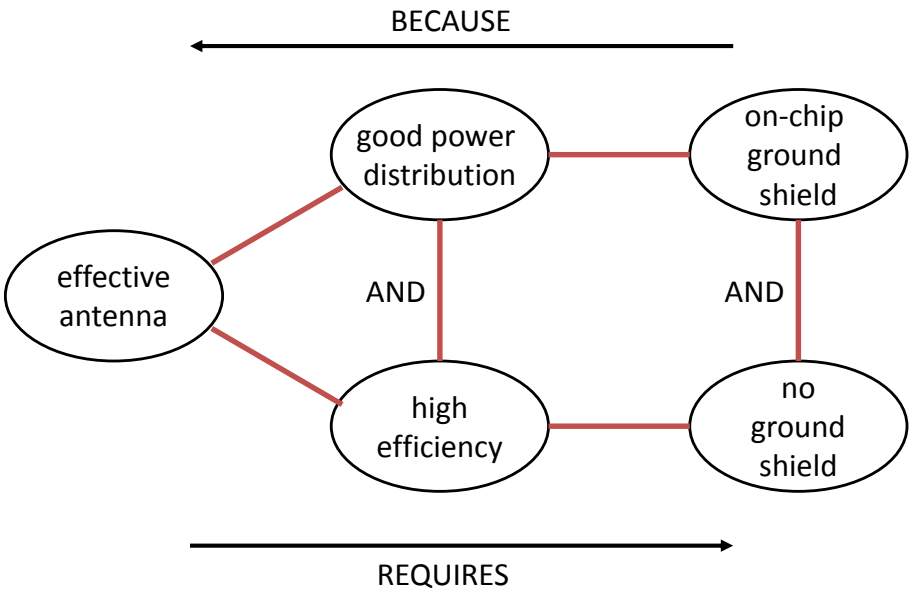
Patent of the month this month takes us on a not-so-rare trip to the California Institute of Technology (maybe something in the airthere?). 'On-chip highly-efficient antennas using strong resonant coupling' was given patent number US8,482,463 on 9 July. Our attention was first drawn to the invention because we had no idea that the efficiency of the on-chip family of antennas was so very small. And then that the solution that allows a remarkable increase in that efficiency being so very elegant in its use of existing resources.

Here's the heart of the problem as described by the pair of inventors:

*One of the important disadvantages of conventional silicon-based on-chip antennas is the low antenna efficiency. The low antenna efficiency is a result of two factors; silicon's high dielectric constant (11.7), and the substrate's low resistivity (1-10 .OMEGA.cm). The high level of doping required to fabricate active circuits limits the silicon substrate's resistivity. Also, as previously reported by the present inventors, both the high dielectric constant of silicon and a relatively large substrate thickness (200-300 .mu.m) cause most of the on-chip antenna output power to be coupled into substrate-modes in unshielded structures.*

*Use of an on-chip ground shield to isolate the on-chip antenna from the lossy substrate causes the radiation efficiency to be very small (around 1%). In standard silicon processes the distance between on-chip metal layers rarely exceeds 15 .mu.m. A ground layer at this distance, which is much smaller than the wave-length in mm-wave frequencies (e.g. 2.5 mm wavelength in SiO.sub.2 at 60 GHz), shorts the antenna by introducing a negative image current very close to the antenna and hence reduces both the radiation resistance and the efficiency. On the other hand, if an on-chip ground shield is not used, the silicon substrate behaves as a dielectric waveguide, generates the substrate modes, and leads the power to the chip edges resulting in an undesirable pattern. Thus, due to the silicon substrate's low resistivity most of the power that couples into substrate-modes disappears as heat reducing the overall antenna efficiency.*

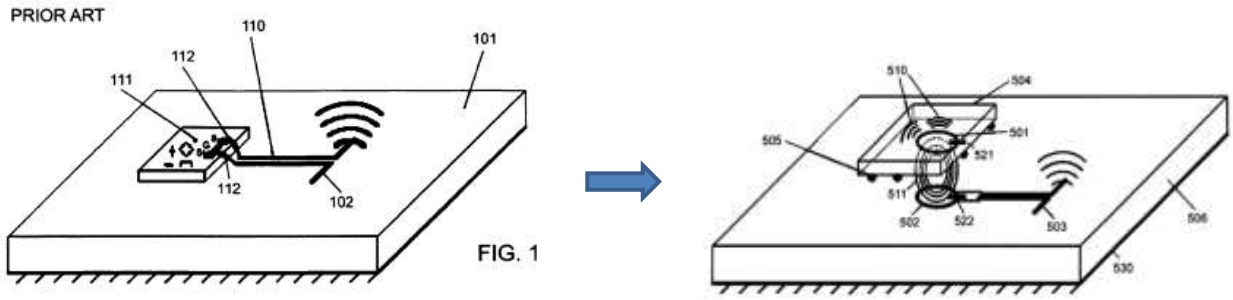
Hmm. Sounds like a 'we want the ground shield and we don't want the ground shield' problem, right? Here's how we might map the problem onto the Conflict Mapping template:




And here's what the Wizard in the Matrix+ software tells us, when we translate the problem:


And here's how the inventors describe their solution to the problems:

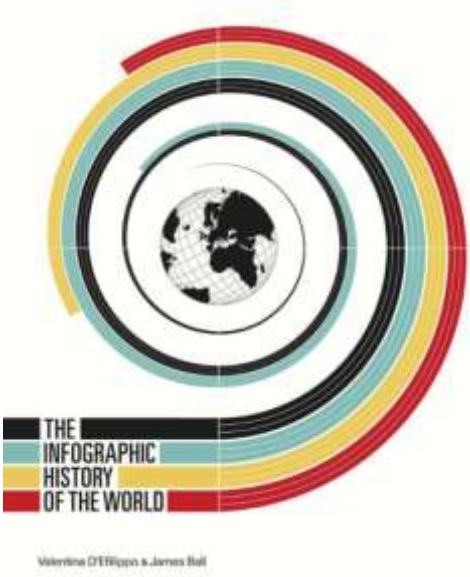
*In one aspect, the invention relates to an antenna structure for coupling electromagnetic energy between a chip and an off-chip element, including a first resonant structure disposed on or in a chip. The first resonant structure is configured to have a first resonant frequency. The antenna structure also includes a second resonant structure disposed on or in an off-chip element. The second resonant structure is configured to have a second resonant frequency substantially the same as the first resonant frequency. The first resonant structure and the second resonant structure are mutually disposed within a near field distance of each other to form a coupled antenna structure that is configured to couple electromagnetic energy between the chip and the off-chip element. The electromagnetic energy has a selected wavelength in a wavelength range from microwave to sub-millimeter wave.*




The main inventive step – and (generically) elegant use of existing resources in that every physical object possesses one – involves making use of resonance… or Inventive Principle 18. The others are equi-potentiality (Principle 12), and Nesting ('resonant structure disposed in a chip').

One of the surprising things about what the Matrix has suggested for this type of problem is how high up the list Principles 12 and 18 are. They are both traditionally very rarely used inventive strategies – certainly when compared to other Principles – and as such seeing them in the Top 6 of any list of recommendations is very unusual. Great to see that the Matrix picked the recommendations up; greater to see another great use of resonance to solve a tough, intractable problem, and therefore maybe acting as a reminder for any of us designing physical objects that natural frequency should always be there, somewhere at the forefront of our ideation thinking.

**Best of the Month – The Infographic History Of The World**

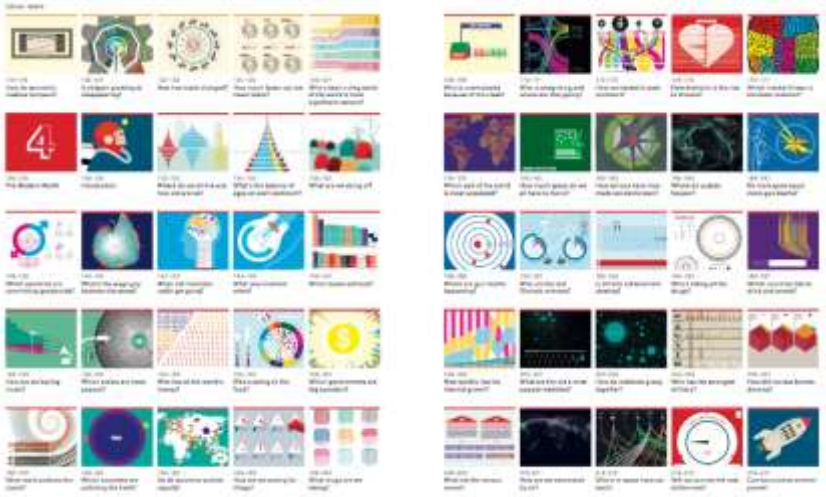



Now here's a sly gem of a book if ever there was one. The ultimate book for people that don't read books. The entire history of the world in 224 pages, and almost no words. London College of Communication alumna Valentina D'Efilippo's is the graphic artist mastermind behind the audacious and, frankly, inspired manner with a graphic.

In *The Infographic History of the* World, Valentina, who studied a Postgraduate Diploma in Design for Visual Communication in 2007, explodes all of time into a visually jaw-dropping feast of facts, trends and timelines that tell you everything you'd ever want to know about the history of the world.

The book has over 100 data visualizations covering everything from the primordial soup to the technological revolution of the 21st century. A story of civilization and barbarism, of war and peace, this is history done in a new way ('history for people that don't like history?') – a beautifully designed collection of the most insightful and revealing trends that tell us what the human race has been up to, and where we're heading. All in all, making it a pretty smart add-on to just about any trend-based ideation session. If you can't find something of interest in here, you might just be dead.

How about this for the world's best index page:



Frankly speaking, you need a copy of this book. You know it makes sense.

**Conference Report – First Buckingham Annual Lean Conference**


It is always great to accept an invitation to come and present to the Lean community, and this year was no exception as the UK/Europe centre of Lean activities made its short-but-strategically enormous trip westwards from Cardiff to the University of Buckingham. We were there to conduct a half-day workshop on '*Invisible Value, Invisible Waste: Tapping Into Unspoken Intangibles: accelerated and pro-active innovation, through TRIZ and Lean Design*', a joint seminar with Chris Cooper from the consulting company Simpler. Our slides can be found on the conference website alongside all of the other presenter contributions for anyone interested.

As ever, conferences these days are a heady mix of the good, bad and ugly. The point being that it's sometimes much easier to spot the good when it's placed right next to the ugly. And, in any event, the whole point, I think, is to make people think. On that front this year's conference did a better than ever job. Helped in no small part by managing to attract an audience of over 150 people over the course of proceedings so there were lots of opportunities for idea-bouncing conversations. The main presentation day was 11 July:

## Thursday 11 July 2013

| | | | |
|---|---|---|---|
| 09:00 - 09:40 | John Bicheno: Welcome & introduction | | |
| 09:40 - 10:30 | David Mann: *Lean Management and Continuous Improvement: What management practices and behaviours create the conditions for continuous improvement?* | | |
| 10:50 - 11:30 | Christian Houborg: *Lunbeck's Prize Winning Lean Program (Shingo Silver)* | | |
| 11:30 - 12:15 | Dave Brunt: *Leadership that develops capability to improve* | | Patrick Graupp: *Overview of the TWI Program* |

| | | | |
|---|---|---|---|
| | *business performance* | | |
| 13:00 – 13:40 | John Seddon: *Study, Study, Study* | | |
| 13:45 – 14:30 | David Mann: *Preparing Executives to support a Lean culture* | Gwendolyn Galsworth: *Visual Leadership: An Introduction* | Suzanne Nuttall: *When Pigs Fly: TWI in the red meat industry* |
| 14:45 – 15:25 | Matthias Holweg: *The Lean Office: Improvements in Overhead Processes* | Mike Hart & Clive Leake: *Leading Lean: Dancing on Ice?* | Patrick Graupp: *A Strategy for Lean Implementation through TWI: Cases and Experiences* |
| 15:30 – 16:10 | Kate Silvester: *Improving Patient Flow in the NHS* | John Russell: *The critical role of Lean Leadership in developing GKN's Continuous Improvement Culture* | Denis Becker & Andy Styles: *Leading the Lean Transformation with TWI* |
| 16:15 – 16:55 | Joakim Hillberg & Pia Anhede: *Applying Lean in Swedish TV Journalism* | Ali Fry: *Modelling the Impact of Lean Improvement* | Justin Watts: *TWI in Banking* |

Difficult to pick out highlights, but if you get a few spare moments, always worth seeing what John Seddon has to talk about. His theme this year, apart from telling everyone how great his new tractor is, was about the perils of standardization. Standardization and complex systems not making for great bedfellows. As ever delivered in his pithy, take-no-prisoners fashion. A joy.

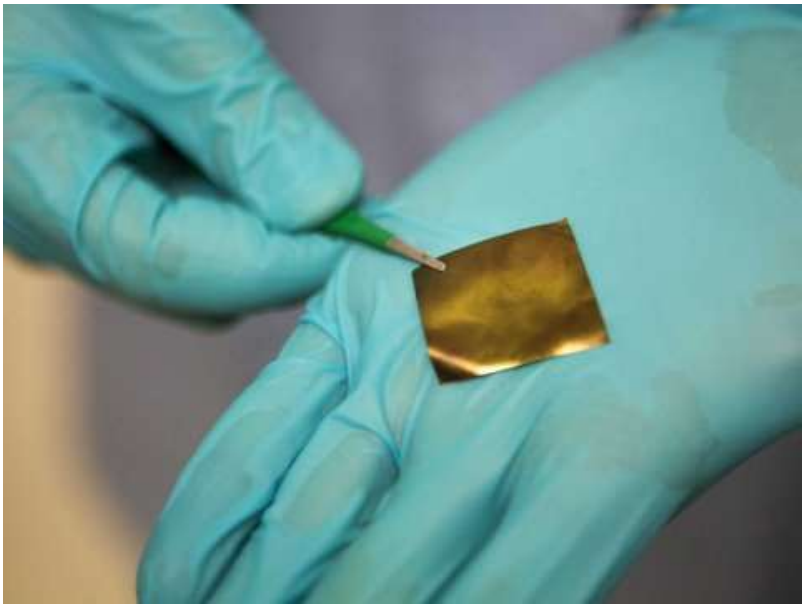
Not quite the same impression came across from the two Americans flown over to play a starring role in proceedings. David Mann had me wishing I could change my surname, within the first ten minutes of his keynote attempt to demonstrate what the opposite of 'charisma' looked like. But maybe that was the point? Lean isn't supposed to be fun, right?

A message not quite understood by Gwendolyn Galsworth, albeit not wholly intentionally I think. The title 'Visual Leadership' was good enough to attract a majority of the participants during the first of the afternoon's parallel streams. I joined the flock because I thought I was about to see a presentation that would teach me a thing or two about saying a lot with pictures rather than words. Turns out I was out by about 180 degrees. Apparently visual leadership involves lots and lots of words and a few massively complicated dashboards. Oh, and if you didn't get a fill from the 100-slides-in-40-minutes blur, we were told that another 90hours of radio broadcasts on the subject were available on line. Visual leadership on the radio? She was telling a joke, right? Turns out no. My laugh wasn't received too well. Sorry, Gwendolyn.

Is it me, or is America feeling more and more like a cruel anachronism? A country somehow missing the (new) plot? I hope not, but on the evidence here, the really exciting Lean stuff is happening in Europe, and in Scandinavia in particular… those are the other highlights to consider having a look at.

Here's hoping for more of their kind of thing at next year's event… taking place slightly later in the year (September), and with a focus on Design… meaning that hopefully I'll get another chance to speak, and have Americans making their retaliatory jokes at my expense. Sounds fair to me.

**Investments – Stretchy Conductors**



Flexible electronics are the gateway to a new generation of phones, brain implants, artificial limbs, solar cells, and limitless other devices that benefit from the ability to bend, fold, and rollup. The problem is figuring out how to make them.

Stretchability and conductivity are difficult properties to combine. Materials that are good conductors do not stretch well and materials that do stretch well are not good conductors.

This happens because the stretching of solid material lengthens chemical bonds, changing the distance between atoms, and in turn, decreasing conductivity. Alternatively, the crystalline structures of metals, which makes them good conductors of heat and electricity, are hard to mold since their internal bonds are not very forgiving.

"This is the story throughout the entire family of stretchable conductors," said study researcher Nicholas Kotov, a professor of engineering at the University of Michigan, who may have developed the best stretchy conductor yet.

The new material is made from gold nanoparticles that are embedded in a flexible synthetic material called polyurethane. The bendy film, described in a paper published in Nature on Wednesday, July 17, can conduct electricity even when stretched to more than twice its original length.

Scientists used electron microscope images to see what happened when the material was stretched. It turns out that the gold nanoparticles aligned into chains when pulled — instead of becoming disorganized — creating a good conducting pathway. Importantly, the nanoparticles rearranged themselves when the strain was released, meaning the process is reversible.

The secret lies in the gold nanoparticles, which were made in the lab so that they they would have a very thin shells on their surface. The thin shells are much better than thicker traditional shells.

"This is important because the shell stabilizes the particles and typically prevents the transfer of electrons from one nanoparticle to the other," Kotov revealed in the Nature article.

Without a thick shell, the electrons can hop from one nanoparticle to another more easily and are able to conduct electricity very well.

The practical applications of elastic metal are far-reaching, but Kotov is particularly interested in how his material can be used to improve medical devices.

There are a number of implantable devices for the brain, heart, and muscles. The problem with these rigid electrodes is that the human tissue easily recognizes them as foreign materials and generates scar tissue as a response, explains Kotov. The scar tissue reduces the performance of implantable devices. A pliable material that is more akin to our soft tissue is key to longer-term implants.

The search for a material that has the unusual combination of stretchability and electrical conductivity is ongoing, but this feels like a critical step forward.

**Generational Cycles – Springsteen And I (Slight Return)**


The other night I had the great pleasure to be at the opening of the new crowd-sourced Bruce Springsteen movie – 'Springsteen & I'. Crowd-sourced in the literal sense of the phrase meaning that 90 minutes of home-made videos from fans had been spliced together to create a tribute collage interspersed with some of Bruce's home movie versions of his concert appearances.

One of the interesting things about Bruce is how he's managed to spread his charms and songs to span multiple generations. So, while his appearance on the music scene made him very much a part of the second wave of Boomers, he has managed to attract an audience that also encompasses GenX Nomads and, more recently, Gen Y Heroes. He's perhaps a reminder, if one were needed, that not everything in life is generationally biased. All three generations were certainly represented in the movie.

But, not that I was looking for it, one thing that began to strike me as the movie wove its way around various parts of the world and different age fans: there was a definite generational bias to how people talked about and appreciated the Springsteen body of work.

Part of me, therefore, thinks that every ezine reader should be given a homework assignment this month: watch the movie and see if you can spot the differences.

Recognising that the words 'homework' and 'ezine' don't necessarily have a lot in common, here are a few clues:

**Boomers** (the majority of the people that made the final cut of the movie) – were usually quite fawning in their appreciation of Bruce, and in almost every case were telling a story concerning how the artist played a significant role in their coming-of-age, or joining with a

life-partner. All in all, there wasn't a lot of humour on display: Bruce was about blue-collar seriousness and a role-model guide through life's trials and tribulations.

**Nomads** (the smallest of the generations represented): a much more sceptical lot. Obviously all influenced by the song 'Born To Run', even though strictly speaking it was a Boomer anthem. It was, however, in 1975 a key song associated for the older Nomads at least with freedom from parents for the first time. Three Nomad stories stood out: I particularly liked the American Mom, who only had Springsteen CDs in her car, so when she was driving the kids around, they were forced to listen to him and only him. Springsteen, in other words, as education/revenge. The second, a wonderfully downbeat British guy whose wife was actually the real Springsteen fan – his job in the film was to suggest that Springsteen's shows were always too long, too intrusive, and basically too everything. The third the fact that Nomads loved the idea that the song Born In The USA was the song of a hidden sceptic: the title smacks of blind patriotism, the verses saying something quite the opposite. A strange paradox here: the song itself was 'authentic' while the album on which it was featured was one of the biggest selling albums of all time (i.e. Nomads and mass-appeal tend not to go together well).

**Heroes**: didn't quite seem to get it, but loved the opportunity to be on camera and to get themselves, fame-junkies one and all, into a movie. Just about all mentioned directly or otherwise that Bruce's words were meaningful and his energy and passion were something to aspire to. 'Why don't we have rockstars like that anymore?' being a somewhat wistful theme. Older 'guru' figure to be listened to and to learn from being the bigger picture message. 'Show us the way, Bruce.'

The overall point being, even in things that in effect span the generations, there are often generational differences to be seen.

Now your turn….

**Biology – Zebra & Ostrich**

Zebras are frequently known to form symbiotic relationships with birds. One of the oddest pairings is with ostriches. Both of these species is justifiably concerned with approaching danger. Unfortunately, the ostrich has terrible senses of smell and hearing and the zebra has poor eyesight. Fortunately, the zebra can smell or hear certain dangers approaching while the ostrich can see others. Both are prepared to warn one another at a moment's notice so they can each flee as needed.

In effect, both ostrich and zebra get to use the other as a solution to the same basic conflict: the need to ensure safety against predation opposed by their limited ability to acquire the necessary sensory information. Here's how we might map this conflict onto the Contradiction Matrix:

IMPROVING PARAMETERS YOU HAVE SELECTED:

Safety/Vulnerability (38)

WORSENING PARAMETERS YOU HAVE SELECTED:

Loss of Information (28)

SUGGESTED INVENTIVE PRINCIPLES:

3, 24, 28, 5, 7, 13, 23

Each merges with the other (Principle 5) and uses the other as an intermediary (Principle 24) to solve its own sensory deficiencies by harnessing those of the other (Principle 28). These guys could've written the Matrix by themselves.

## Short Thort

*Our revels now are ended.*
*These our actors, As I foretold you,*
*were all spirits and Are melted into air,*
*into thin air:*
*And, like the baseless fabric of this vision,*
*The cloud-capp'd towers, the gorgeous palaces,*
*The solemn temples, the great globe itself,*
*Yea, all which it inherit, shall dissolve*
*And, like this insubstantial pageant faded,*
*Leave not a rack behind.*
*We are such stuff*
*As dreams are made on,*
*and our little life Is rounded with a sleep*
William Shakespeare

*Creating something out of thin air is easy.*
*It's finding the air that's hard.*
Asher Trotter.

## News

**Mentoring Service**
We get asked a lot, so now we've finally managed to get our act together to offer a formal SI mentoring service. The basic idea is to offer accelerated learning and shorter time to success stories for individuals, usually working in large organisations. Typically involving a weekly two-way interaction – one setting challenges for enrollees to work on; the other, assisting enrollees to work on real company problems. For further details, please contact Cara in the UK office in the first instance.

**Austria**
It feels like a long time since we were last there, but finally we get to return to Graz during the first week of October. Primarily for client project work, but it also looks like we'll be running a couple of public seminars – one on the 2nd, and another on the 5th. More details on the (hopefully coming soon… long story!) website.

**Buckingham Lean MSc**
The next SI session will now take place on 9 and 10 December at the University of Buckingham. For anyone interested in participating in what is generally reckoned to be the finest Lean curriculum on the planet, a new cohort group kicks off in January… with a 1-day introduction to SI during the first week. Brave people.

**UK Workshops**
The Autumn round of public workshops are currently available for viewing (and booking!) on Eventbrite.

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

- Pharma – TrenDNA workshops
- Automotive – SI Workshop series
- Automotive – Mentoring programme
- Automotive – turnkey development project
- FMCG – design/make project
- Water – Directed Open Innovation project
- Government – strategy definition support study
- Medical devices – TrenDNA/SI workshop series
- Healthcare – PanSensic study