Systematic Innovation

e-zine

Issue 129, December 2012

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.

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

The Steak/Sizzle Paradox

This month takes us back to our occasional series of articles looking at high-level organizational contradictions. We became minded to look at this one – the fight between steak and sizzle – following a series of comments from prospective new clients with a desire to do some 'easy' 'innovation stuff'. Our initial response to the queries was, 'sorry, we can't help you' (there is nothing quite so liberating as saying 'no' to someone!). Upon reflection, it provoked us to start re-using our old 'innovation is hard, dummy' aphorism. Another couple of weeks of incubation and we're now left with the thoughts presented here.

A really good way of presenting these kinds of high level contradiction is through the classic 2x2 management matrix. Figure 1 attempts to construct such a picture for our steak/sizzle dilemma:

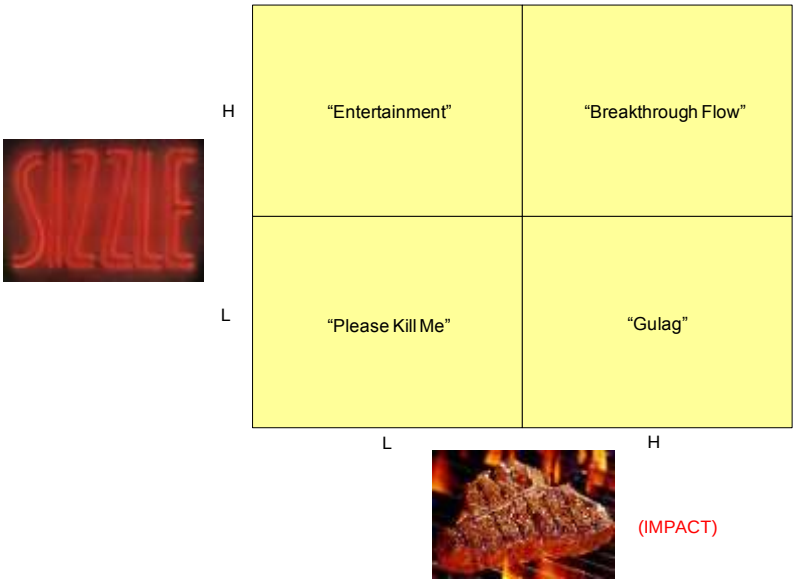


Figure 1: Steak/Sizzle 2x2 Matrix

As in any 2x2 matrix worth its salt, the place to be is up in the top right-hand corner of the picture – this is the place where we get high levels of both steak (i.e. impact – we make a positive difference) and sizzle (i.e. everyone enjoyed the process and felt inclined to tell others about it). We've labeled this precious, steak-sizzle contradiction-solving segment 'breakthrough flow', since it is all about consistently achieving those so-called 'flow' states where, like Olympic athletes, awareness of time seems to disappear completely and there is pure focus on the task at hand. Which in our innovation case is all about generating and executing breakthrough solutions.

The other three segments have also been labeled:

'*Entertainment*' – is the segment of high sizzle and low impact: in these kinds of innovation activities, everyone will come away from them thinking, 'wow, that was fantastic', only to find themselves scratching their heads a couple of days later when they realize the good time they just had actually delivered zero output of any value.
'*Gulag*' – is the segment on the other side of the contradiction – these are the kinds of innovation programme that are rigorous, often painful, full of dull moments, and feel like

hard work, but when the pain has disappeared and we look back on them, we see that they delivered meaningful impact.
'*Please kill me'* – is the worst place to be in on the matrix – no-one enjoyed what they were doing, and nothing useful came out of it either. Most meetings within large organizations, in our experience, tend to find themselves in this category.

Figure 2 attempts to place some well known innovation tools and methods onto the matrix:

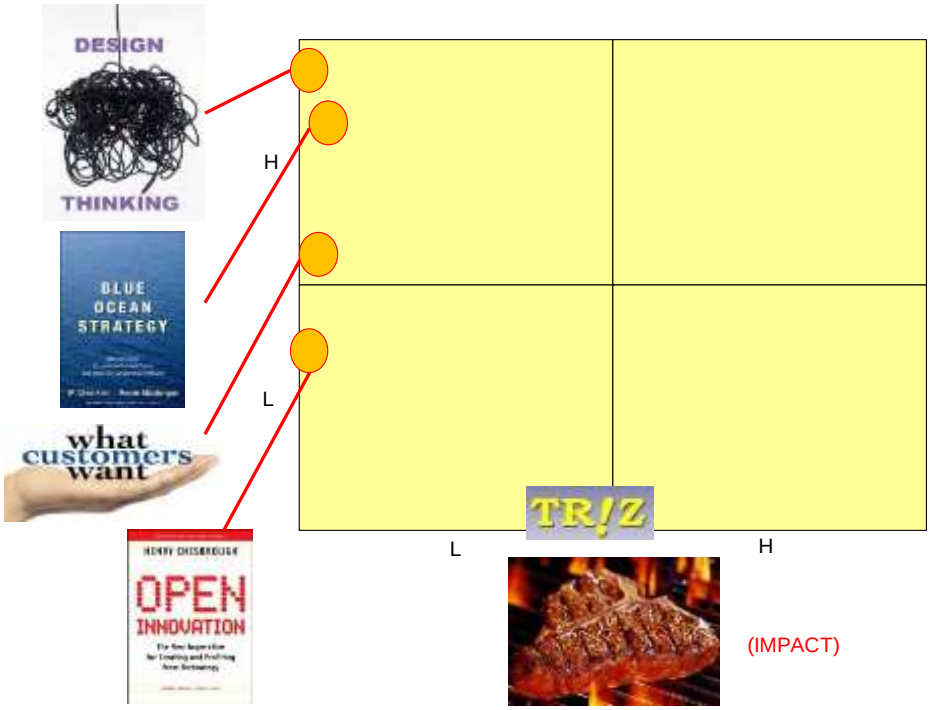


Figure 2: Key Innovation Methods Placed On The Steak/Sizzle 2x2 Matrix

Top of the 'high sizzle' list right now is so-called 'Design Thinking'. One just has to look at the queue of senior leadership teams outside every 'D-school' in and around Stanford to see how this sector of the innovation world has turned sizzle into a fine art. Charging senior executives a fortune to play with Lego for a couple of days is the innovation equivalent of crack-cocaine right now. The D-school industry has also done a great job of convincing each of those executives to tell all of their other executive buddies they need to go through the experience too. Which, in fairness to the Design Thinking community, they probably do. Except, there's just one tiny missing detail: go talk to these executives a couple of months after their design-epiphany and ask 'what's changed?' and the quickly apparent answer is nothing. Unless you count a few Megabytes of very smart design-y new Powerpoint presentations.

Design Thinking has probably overtaken Blue Ocean Strategy in terms of its high level of executive sex-appeal. Too many organizations have now discovered the reality of Blue Ocean for it to continue to top the sizzle list – for most organizations, it is simply the wrong process to help deliver what the organization is capable of delivering, and hence the impact is usually about as close to zero as it is possible to get.

Ditto for Strategyn's 'Outcome Driven Innovation'. At least they get the 'outcome' part of the story right, though. The only really impact-sapping problems with ODI are its complete ignorance of the importance of contradiction-solving and, usually more frustratingly, that it

forces organizations to conduct (or rather 'pay for') lots of nugatory customer data. What customers want is usually not what ODI helps you to discover.
And also ditto for 'Open Innovation', although this is now probably old enough that sufficient organizations have seen through the smoke and mirrors, to now know that it rarely if ever delivers any quantifiable impact. As such it has probably slipped across the sizzle boundary line between 'entertainment' and 'please kill me'. Being involved in an OI programme inside your organization these days is akin to being told your career as an innovator is over. Sad but true.

If offerings like OI, ODI, BOS and Design Thinking rule the sizzle axis of the plot, the all time master of the impact-but-no-sizzle axis has to be TRIZ. Everyone that has been through a proper TRIZ project will know that it will nigh on always deliver when it comes to an impactful answer or meaningful way over an execution hurdle. But in so doing it is pretty much the antithesis of 'sizzle'. No-one wants to go home and tell their family they worked on a tough problem at work and solved it using 'Inventive Principle 19'. Not only does it sound dull as ditchwater, but it also sends out a clearly interpretable message that all the team 'merely' did was look up 'the answer' in a table. Which couldn't be further from the truth, of course, but it still misses the whole point about sizzle – and creating a wow story that you want to tell your kids about.

Like all good things, of course, once we've identified an intriguing contradiction – in this case, 'I want steak *and* sizzle' – it becomes possible to set about uncovering solutions. Figure 3 plots the dilemma onto the conflict mapping template:

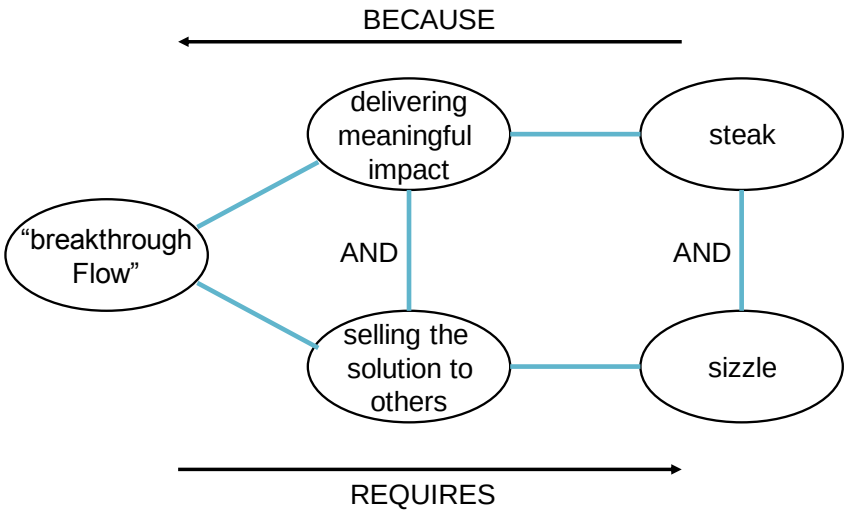


Figure 3: The Steak/Sizzle Contradiction

As with a lot of these kinds of high-level contradiction maps, it now becomes difficult to generate actionable solutions because the specifics are inherently dependent upon the context of a given situation. Hopefully the template itself provides some important clues. But then, rather than leave readers in that kind of awkward 'now go generate your own ideas' limbo, we thought we'd input a couple of thoughts that we've had occasion to test and so have a pretty good idea that they help move the steak-sizzle story into the 'breakthrough flow' space:

Separation in Space – create context-appropriate 'steak' and 'sizzle' places within a project team. A lot of teams in any event will set up some kind of 'war-room' when they're working on a longer term project. What solving the steak-sizzle contradiction means here is in effect creating two war-rooms – one in which people know 'in here we do all the hard

graft', and the other in which all the fun, entertainment, show-and-tell stuff happens. If nothing else, these two spaces get people into a context appropriate mindset the moment they enter either space.

Separation in Time – the process of generating and proving the eventually-winning breakthrough solutions requires the hard work that comes with the 'steak' part of the innovation process, but this work happens at usually a very different time to the 'selling' part – whether that 'selling' activity be to supervisors and managers or to the kids when we get home from work. We've worked with several teams for an hour or so at the end of the hard-graft part of a session to come up with the 'sexy' story they can use to fire other people up in the manner that their impactful breakthrough solution deserves. 'Local Quality' isn't sexy; 'collateral damage' is.

Principle 13, The Other Way Around – we've only been brave enough to adopt this one (deliberately at least!) once, since we think it either requires a facilitator with an awful lot of chutzpah, or a group with a very open mind. We took our inspiration for this idea from the Dick's Last Resort restaurant chain in the US – where the sizzle comes from staff that are deliberately rude to customers rather than the usual fawning tip-seeking politeness one would normally expect to receive in an American restaurant. The innovation equivalent of Dick's basically goes with the idea of 'negative-sizzle' – Figure 4 – and a facilitator that goes out of their way to turn steak sessions into 'not fun' places to be – in effect making fun out of *not* having fun.

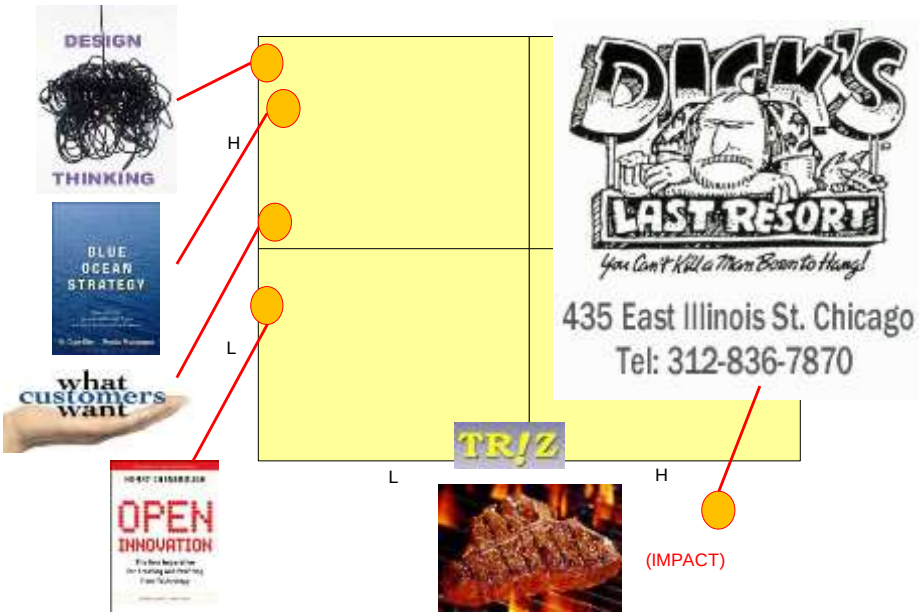


Figure 4: 'Negative-Sizzle' As Steak-Sizzle Contradiction Solution Strategy?

Innovation fundamentally *is* hard (dummy!). If a prospective innovator is intent – really – on making a difference, it's a very good idea to recognize the steak/sizzle contradiction. Even better is to recognize that one of the best and easiest ways to resolve that contradiction is by separation in time: let the steak do the heavy lifting, then bring in the sizzle to do the inevitable solution selling job.

Where To Innovate Plus Two

As we continue to find benefits in expanding the Law Of System Completeness from five to six elements – Figure 1 – one of the downsides is that it necessitates changes to a broad swath of tools within the TRIZ/SI portfolio. One of those tools, our 'Where To Innovate' template has shown itself to be particularly amenable to the benefits resulting from the expanded Law.

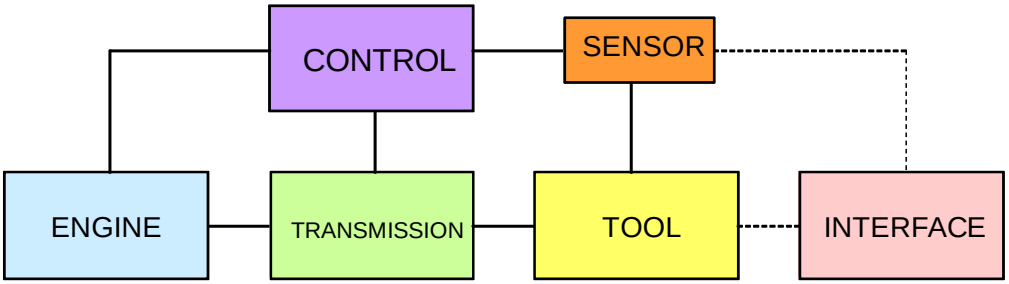


Figure 1: Six Element Version Of The Law Of System Completeness

The sixth element in this revised model is the 'Sensor' – that entity or cluster of entities responsible for providing the data and information flows between the various other elements of the complete system. Sensor has always been at least implied in the previous five, or even four element versions of the Law, since the only way in which a control system can control the other elements is if it possesses the appropriate input data upon which to make control decisions. The problem with something being 'implied' as opposed to explicitly present is that it is too often possible to forget to take due account of it.

This turned out to be particularly the so when it came to using the Where To Innovate template reproduced in its new form in Figure 2:

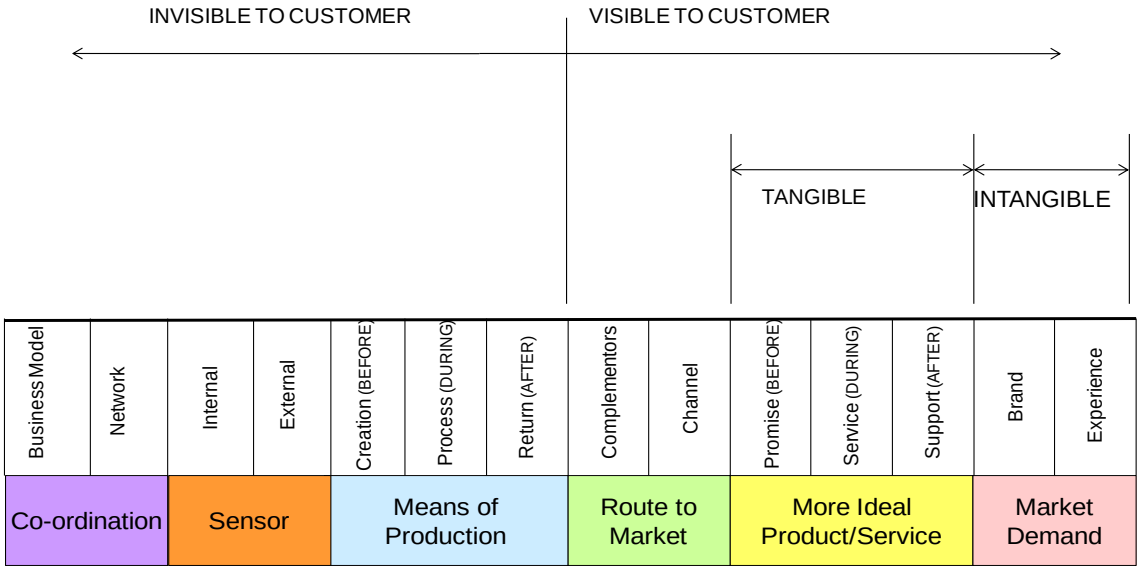


Figure 2: Expanded 'Where To Innovate' Template

What this template essentially does is forces the prospective innovator to examine where innovations have occurred in the past – distributed across the 12 (now 14) different possible segments that can be inferred from the System Completeness Model.

The figure shows that the addition of the sixth 'Sensor' element has resulted in the addition of two new columns in the overall template. Like the Co-ordination element, which it sits closest to in an actual system, there are two distinct families of sensor type that might be innovated within a given system – one looking *inside* the system, and the other looking *outside*. Both are likely to be invisible to the customer, since their function, both internally and externally is to acquire data and information. While strictly speaking a customer might be made aware that a new form of data sensing technique is being used on them, the information being acquired is primarily there to assist the 'Control' function to make better decisions *inside* the system.

No sooner had we drawn the Figure 2 version of the template than we realized there were many, many examples of innovations that had come about through additions or changes to the things that an organization sensed. And that more often than not, when we reviewed old versions of the template, these 'sensor'-based innovations had not been picked up. Far worse, was the subsequent discovery that, when the template has been completed and the innovation white-spaces had been identified, it was possible to generate a whole series of new white-space filling sensor ideas that again had not arisen in previous sessions when an explicit 'sensor' cue had not been provided.

Typical examples of 'sensor' innovations that we can see in the big wide world include:

- The realization of new measurement methods in the healthcare world (eg MRI scanners, ECG, etc) opened up a whole suite of new restorative treatments that could not have been realized without the ability to 'see' what was happening in the patient
- There are similar knock-on sensor effects in other industries – realization of a means of measuring something that couldn't previously be measured opens up a host of product and other innovation opportunities. The gas-turbine industry used to spend a lot of time and effort blindly trying to optimize turbine blade tip clearances – it wasn't possible to see what was happening inside the engine and so no-one really knew what the clearances were at any point in time. The advent of x-ray measurements – later followed by live-streaming x-ray – allowed engineers to see what was actually happening live and in the moment, and as a result devise much more effective clearance control design strategies.
- Slightly more mundane technically, but in many ways the core of the reason for the dominance of supermarket chain Tesco in the UK was their introduction of the Club Card – something that has turned into an astonishingly powerful means of understanding the present and likely future needs of each individual family that shops in the store. It is possible, for example, for Tesco's to reliably predict that a woman will become pregnant several months before she actually is pregnant, just based on shifts in spending behaviour. Again, a new measurement capability allowed a whole series of other innovations to be sparked.
- Our own recent forays into the world of qualitative data analysis (see JupiterMu white paper for example, or the Mental Gears social-media scraping tool described in the October 2012 ezine) should also be viewed as potential sensor innovations for just about every industry – enabling as they do the objective measurement of intangible, unspoken, 'real-reasons' driving the behaviours of people.

This short list should provide a few specific pointers to what a 'sensor' innovation actually is. The following two figures provide a few more generally applicable questions to assist innovators in the search for past innovations and future innovation white-space-filling opportunities. Figure 3 shows a list for the internally focused Sensor innovation finding search. Figure 4 does the same for the externally focused equivalent:

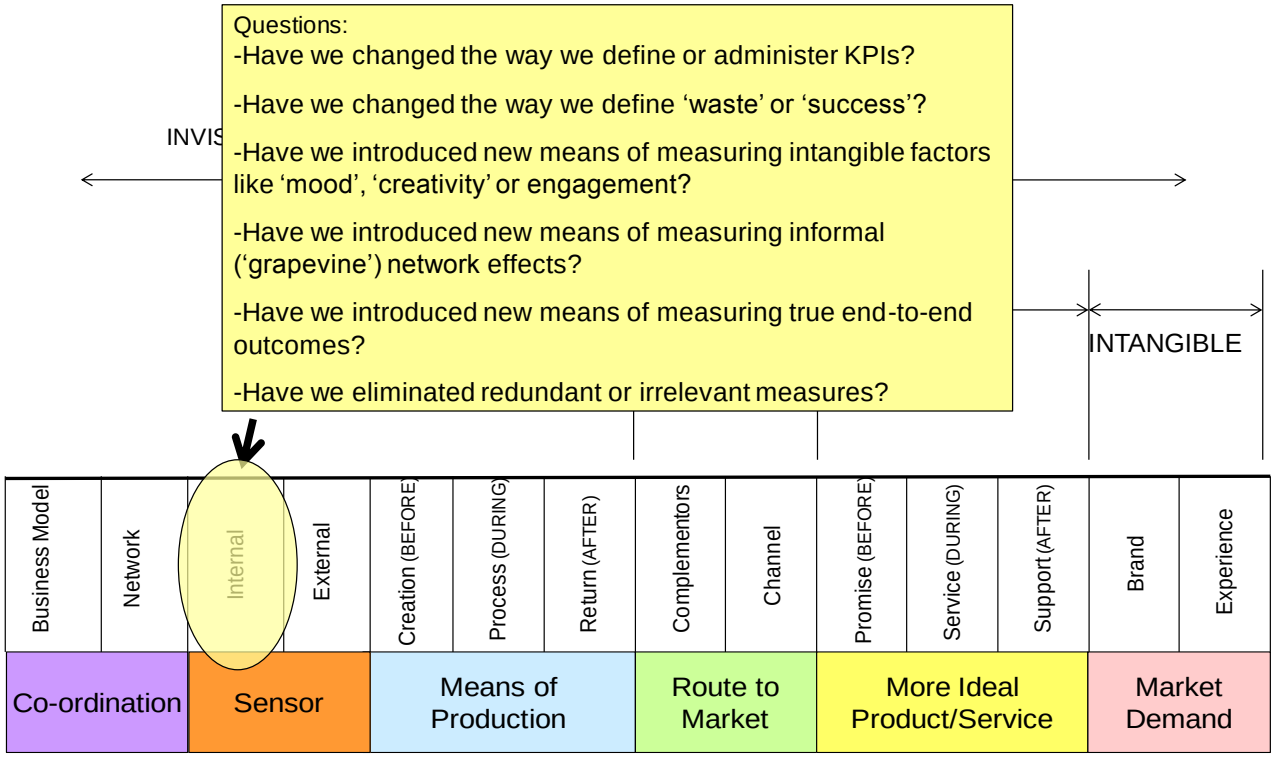


Figure 3: Typical Internal Sensor Innovation Opportunity Finding Questions

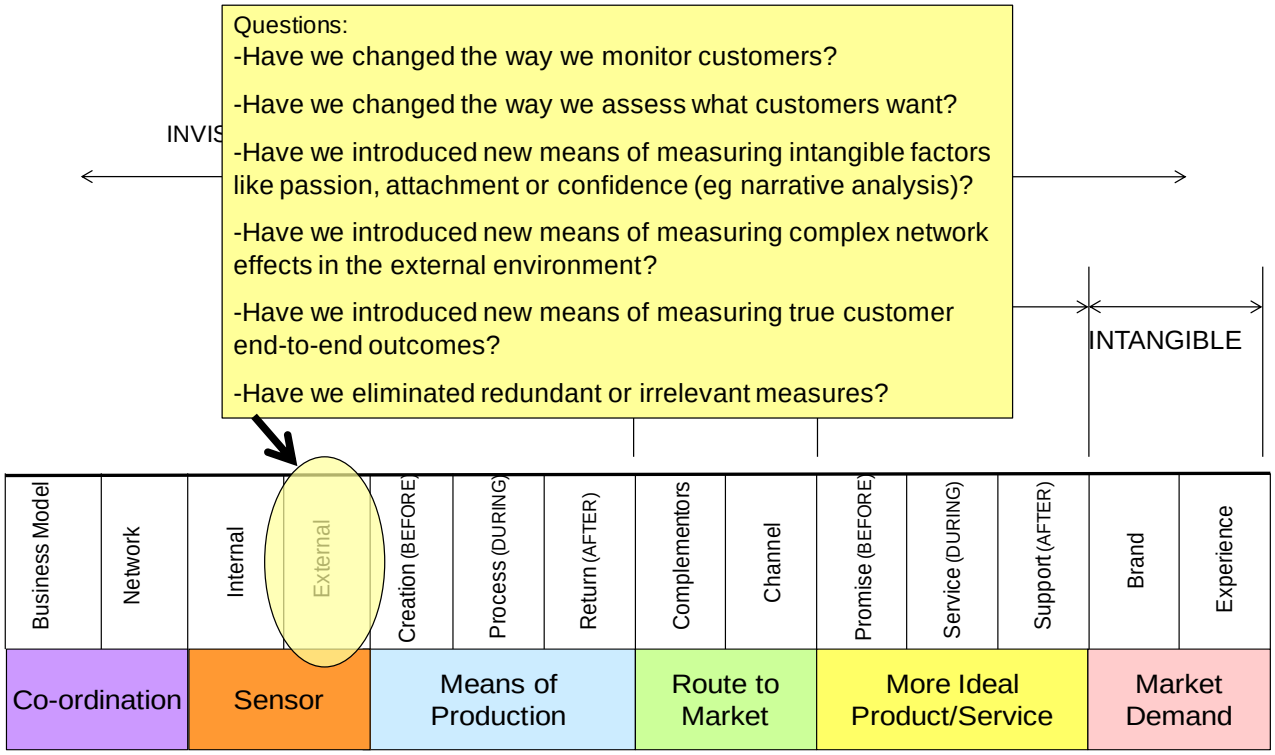


Figure 4: Typical External Sensor Innovation Opportunity Finding Questions

Over to you. Bet you find a host of new opportunities!

Humour – Ho, Ho, Ho, It's Christmas

For many of our readers, Christmas is a time for celebration, relaxation and generally having a good time. In recent years, a significant part of the 'having a good time' aspects of the holiday has exhibited itself in the form of ever more extravagant displays of Christmas lights. Usually appended to the outside of the house, and often causing a not insignificant energy supply challenge for the electricity providing utilities.

As we all also know, every trend direction ultimately generates a counter-trend. 2012 seems to have been the year in which that counter trend started in earnest. In previous years, a person might have donned a pair of sunglasses and sat at home quietly seething about the gaudy, monstrous display of flashing coloured lights coming from next door. This year, it's time for a few lights of your own:

Generation X – looking to spoil their protected kids no doubt – in all probability started the light trend. Now it looks like they also get to, in true alienated-member-of-society fashion, hopefully end it. Here's another pair of interesting bah-humbug festive-light alienation pieces to throw into the mix:

Not to mention other forms of anti-corporatization of the holiday season protests. Here's one for the very likely child-less 'tis' the season to be jolly' refusenik:

Or, if that one seems a tad brutal, how about something more in keeping with the recessionary times many Christmas-celebrating countries find themselves in at the end of 2012:

Perhaps not the best Photoshop job in the world, but, fingers-crossed, Santa might just turn up with a training workshop gift for you in time for next year. That's provided he manages to not get tangled up in all that damn decorative lighting… here's our favourite ever festive house decoration:

Notwithstanding the multitude of calls to the Emergency Services made by kind-spirited passers-by this display apparently provoked. Bless you all.

Patent of the Month - Bubble Launched Electro-Spinning Jets

A Happy Christmas to inventors at the University of Akron in Ohio. Their elecro-spinning invention was granted US patent number 8,337,742 on December 25. Nice to know that the USPTO still works over the holiday season. Our notice was first drawn to the invention for its unexpected incorporation of 'bubbles' into a previously well-known, well-established manufacture process. As such, if nothing else, it gives us a very nice new data-point on the Space Segmentation evolution trend – which, of course, states that adding holes to stuff always carries a benefit.

Here's what the Akron team have to say about the problem their invention purports to solve:

The technique of electrospinning, also known within the fiber forming industry as electrostatic spinning, of liquids and/or solutions capable of forming fibers, is well known and has been described in a number of patents as well as in the general literature.

The process of electrospinning generally involves the creation of an electrical field at the surface of a liquid. The resulting electrical forces create a jet of liquid which carries electrical charge. Thus, the liquid jets maybe attracted to other electrically charged objects at a suitable electrical potential. As the jet of liquid elongates and travels, it will harden and dry. The hardening and drying of the elongated jet of liquid may be caused by cooling of the liquid, i.e., where the liquid is normally a solid at room temperature; evaporation of a solvent, e.g., by dehydration, (physically induced hardening); or by a curing mechanism (chemically induced hardening). The produced fibers are collected on a suitably located, oppositely charged receiver and subsequently removed from it as needed, or directly applied to an oppositely charged generalized target area.

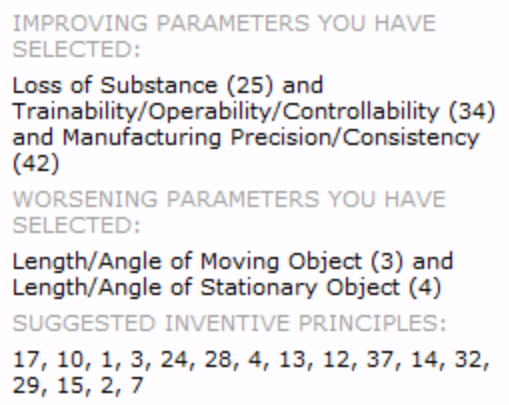
Fibers produced by this process have been used in a wide variety of applications, and are known, from U.S. Pat. Nos. 4,043,331 and 4,878,908, to be particularly useful in forming non-woven mats suitable for use in wound dressings. One of the major advantages of using electrospun fibers in wound dressings, is that very thin fibers can be produced having diameters, usually on the order of about 50 nanometers to about 25 microns, and more preferably, on the order of about 50 nanometers to about 5 microns. These fibers can be collected and formed into non-woven mats of any desired shape and thickness. It will be appreciated that, because of the very small diameter of the fibers, a mat with very small interstices and high surface area per unit mass, two characteristics that are important in determining the porosity of the mat, can be produced.

Besides providing variability as to the diameter of the fibers or the shape, thickness, or porosity of any non-woven mat produced therefrom, the ability to electrospin the fibers also allows for variability in the composition of the fibers, their density of deposition and their inherent strength. By varying the composition of the fibers being electrospun, it will be appreciated that fibers having different physical or chemical properties may be obtained. This can be accomplished either by spinning a liquid containing a plurality of components, each of which may contribute a desired characteristic to the finished product, or by simultaneously spinning, from multiple liquid sources, fibers of different compositions that are then simultaneously deposited to form a mat. The resulting mat, of course, would consist of intimately intermingled fibers of different material. A further alternative noted in the U.S. patents is to produce a mat having a plurality of layers of different fibers of different materials (or fibers of the same material but different characteristics, e.g. diameter), as by, for example, varying the type of fibers being deposited on the receiver over time. For example, wetting and non-wetting polymers each offer additional properties that may be desirable in different applications…

…The resulting fibers are deposited in a random and diffuse manner. This results in material being deposited outside the target area, causing waste. The general electric field on which formation of fibers depends, may also preclude deposition of fibers in the deepest part of a laceration or other deep wound, because fibers will be attracted to and deposit themselves on the portion of the wound closest to the electrospinning apparatus. The rate of hardening or drying is also dependent

on factors such as the path length of the jet of fluid. This, in turn, influences the physical characteristics of the non-woven article.

So, from a contradiction perspective, the key problem resolved by the invention is the fight between the desire for waste-less, consistent, controllable generation of fibres and the inability to achieve this due to various length-related issues. Here's how we might best map that problem onto the Contradiction Matrix:



Eagle-eyed readers will notice that we've been quite liberal with our selection of mapping parameters. Not surprisingly, this breadth of interpretation gives a relatively long list of recommended Inventive Principle solution triggers.

Alas, however, the list contains no mention of Inventive Principle 31, 'Holes'. Which is a pity since this would have been the strongest link to the 'bubble' strategy inherent to the invention's success at solving the problem:

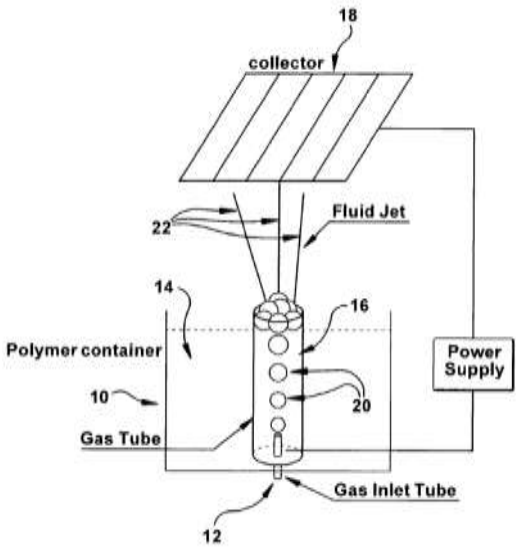
…the present invention relates to a method and apparatus for creating fibers from a spinnable fluid using bubbles as a platform for launching the fluid jets which eventually become the fibers. Therefore, there is provided a source of spinning fluid infused with one or more gas bubbles, and a mechanism for applying an electric force to a bubble causing a jet to emerge from the bubble surface. The use of bubbles as a platform for generating fibers from suitable spinning solutions or fluids provides an important advance in fiber spinning technology. The bubble provides a means of concentrating electrons at the fluid surface in a manner that promotes the formation of a field gradient strong enough to overcome the surface tension forces of the fluid, resulting in the launching of a jet of fluid. The shape of the bubbles naturally enhances the concentration of the electrons at the apex of the bubble, which is not possible on a flat surface, making launching of a jet of fluid from the bubble apex easier and more controllable. The jets of fluid initially follow the local electric field at the surface of the bubble, and then curve as they experience the electrical attraction from a suitable collector. Each bubble has the potential to create or generate multiple jets, either simultaneously or in succession, or both, with each jet becoming a fiber. Given the foregoing, the process provides a renewable means of generating fibers. This invention uses bubbles with diameter ranging from 1 mm to 20 mm.

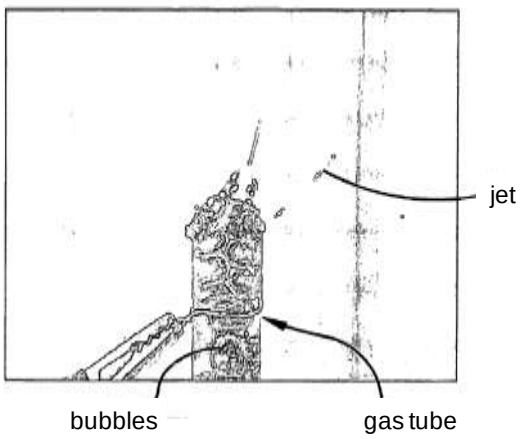
The bubbles are created by the introduction of gas to the fluid. In that instance where more than one gas inlet is provided, each inlet may introduce the same or different gases to the spinning fluid. The gas can be any substance that will create a bubble at ambient conditions, i.e., temperature, pressure, etc., that surround the electrospinning apparatus. For example, the gas may be air, nitrogen, carbon dioxide, or any inert gas that is convenient to the process and does not react with the spinning fluid. If the gas is very soluble in the spinning fluid, i.e., having a solubility such as that of carbon dioxide in water, the bubbles may be created merely by evaporation of the gas from the liquid. Foaming agents that release gas as the jet is elongated may create "chains of bubbles" in the resulting fibers. Alternatively, or in addition, nanofibers

having varying configurations may be made to include bubbles on the interior thereof depending on the geometric arrangement.

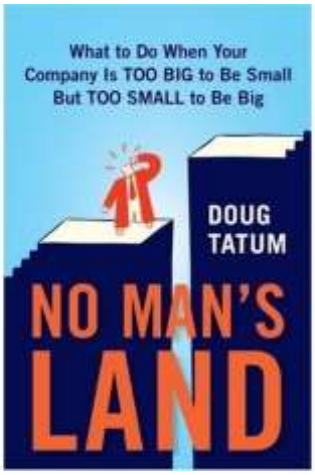
We're still trying to work out whether this 'omission' from the Matrix is indicative of a general principle of solving this type of contradiction that has rarely (or never?) been seen before. Or whether – perhaps more likely – US8,337,742 provides a timely reminder that just because *a lot* of people have solved a problem using a given Inventive Principle doesn't necessarily mean it will give the *best* solution: sometimes it's good to check out the least obvious, least frequently used Principles when it comes to generating breakthrough solutions.

While we sort that conundrum out, e-zine readers might like to check out the invention disclosure, even if they're not so interested in electro-spinning, to see what 'effective and succinct' means in the patent writing context.





Best of the Month – No Man's Land



In true 'someone, somewhere already solved your problem' fashion, we found this 2007 book during the latter stages of our own Hero's Start-Up Journey book project. We wanted, at the conclusion to our book, to point the way ahead for entrepreneurs that had completed their first Hero's Journey – getting their businesses to a first point of stable success – to let them know that there would sooner or later come a second Hero's Journey. This time one that would see them transform their successful small enterprise into a successful big one. Doug Tatum's 'No Man's Land' turned out to provide the pointer we were looking for. In it has to be said a pretty admirable fashion. Not only that, but it also makes for a pretty good play-book to assist entrepreneurs to actually make this next Hero's Journey. The book's sub-title even does a pretty good job of identifying the basic underpinning physical contradiction that lies behind the 'Ordeal' inherent to growing a business to the point of successful 'bigness' – 'too big to be small; too small to be big':

In essence, big companies require the delivery of supporting functions that, above a certain size, can no longer rely on the close relationships inherent to a small company with 15 or less people inside it. Hence, as shown in the figure, there comes a period when fixed costs need to make a step change, even though revenues have not and cannot make a similar step change.

As summarized by one reviewer, "if starting a company is difficult, leading a company once the business has caught fire is infinitely more so. Thousands each year approach the

dangerous transition that Doug Tatum calls No Man's Land—when they are too big to be considered small but still too small to be considered big.
"Rapid growth is every entrepreneur's dream, but it never comes easily and is usually rife with dilemmas. During No Man's Land, as in human adolescence, such growth should spark self- discovery, acquired discipline, and positive but difficult transition. Unfortunately, it often becomes an agonizing battle between the natural tendencies of a lonely entrepreneur and certain immutable laws of growth. The result is confusion, frustration, stagnation, loss of employee morale, and, at worst, financial failure.

"Sounds pretty bleak. The good news is that Doug Tatum knows exactly what it takes to get through No Man's Land: a map, a high place from which to orient yourself, and navigational rules to help you track your progress. And these tools are here in this book. If you're an entrepreneur, this book will help you make your company all it can be and all you want it to be. It will prepare you for a ride that just might be wilder than you ever imagined."

Okay, so the book does a pretty good job. We have no hesitation in recommending it to businesses either at the beginning or somewhere through the small-to-big Hero's Journey. In an ideal world, there are a few other things we'd love to have had Mr Tatum include, but, hey, nothing's ever ideal. Far better to have something that does the majority of the job, than have nothing at all.

The No Man's Land recipe for success divides the transition problem (Tatum never talks about the s-curve jump inherent to any Hero's Journey, but does use other evocative language to clearly show he means the same thing – 'flying blind', 'uncharted island', etc) into five M's – itself a good indication that we have something like a complete viable system to help us. His five M's are:

- Market – understanding the inherent transition in customers and the manner in which the organization needs to deal with them through the no man's land and out the other side.
- Management – understanding the changes that will be required in the management of the organization
- Model – building and testing of a revised economic model to assure continued profitability as the business scales upwards
- Money – understanding the practical requirements for attracting the needed funds and cash-flows
- Momentum – understanding the shifts in corporate culture necessitated as the enterprise transitions through no man's land

Each of these five sections carries with it at the very least a series of 'remember to' and 'make sure you've thought about' prompts. Which is probably good enough for any thinking business leader. That said, there are more than a few 'insert miracle here' moments dotted around ("does your firm have positive momentum? If not, what can you do to regain it?"). Anyone looking for meaningful insight into whether your ideas for regaining momentum (or a host of other important questions) are good ones or not is alas going to be disappointed. While in no doubt that Mr Tatum's company has considerable experience in helping clients through their own No Man's Land adventures (see www.tatumllc.com), it would've been great if they'd actually followed their advice and, if not given a series of recipe-style answers, at least made a few suggested solution clues to back up the questions the book poses. But, hey, that's ultimately just us being our usual TRIZ/SI-land churlish selves. Doug Tatum's book identifies and does a pretty darn good job of filling a significant hole in the management textbook canon, and as such has saved us a lot of time not having to re-invent the wheel at the end of our book. It's also very readable, and a really useful reminder to us all that getting a proportion of the small

enterprises in any country through No Man's Land is one of the keys to the success of that nation.

Investments – Atmospheric Photochemical Accelerator

A very interesting TRIZ-like solution makes it to our investment feature this month. It also looks like a pretty timely one given that industries across Europe are currently being threatened with shutdown as European Union emission rules for Volatile Organic Compounds are tightened. The invention in question, an air cleaning invention from the University of Copenhagen, has recently proven its ability to remove these compounds. And in the process they have helped a business in Danish town Aarhus improve relations to angry neighbors.

Inventor, Copenhagen chemist Matthew Johnson, presented evidence for the air cleaning invention at the conference "First International Education Forum on Environment and Energy Science" held on Hawaii December 14 to 18.

In deepest secrecy the inventor Matthew Johnson from the Department of Chemistry at the University of Copenhagen has been collaborating with an investor, INFUSER, in mounting and testing a revolutionary air cleaning device at the industrial plant, "Jysk Miljoerens" in Danish town Aarhus. The reason for keeping the testing secret was that they wanted to be absolutely sure that they could in fact remove the pollution before going public. Now their measurements are concluded and the results are in. And the device actually works.

Natural way to remove air pollution
At the department of Chemistry atmospheric chemist Matthew Johnson invented and patented the air cleaning method which is based on the natural ability of the Earth atmosphere to clean itself. In a process triggered by sunlight, polluting gasses rising into the sky start forming particles when they come across naturally occurring compounds such as ozone. The newly formed particles are washed out of the atmosphere by rain. Once the rain hits the ground, the atmosphere is clean again. In other words the whole process is nature's own purifications works, explains Professor Johnson.

"I have investigated the self-cleaning mechanism of the atmosphere for years. Suddenly I realized, that the mechanism is so simple, that we could wrap it in a box and use it to clean indoor air. This makes for a better indoor climate, and in this particular case it also removes smells from this industrial process allowing the company to stay in business and making the neighbours happy," says Matthew Johnson.

Fruitful collaboration between business and research
For the INFUSER CEO Lars Nannerup the new air cleaning method was heaven sent. For some time he had wanted to establish a cleantech business delivering green and sustainable solutions to industry. For INFUSER, collaborating with the University of

Copenhagen has been extremely fruitful. We have been operating in an electrifying field between fundamental research and commercial development. This is an area where pure theory and good ideas are tested outside the very competent walls of the university. And we have been extraordinarily successful. We are excited to be able to bring to market this revolutionary technology. We are proud that it is a Danish invention, and we're proud that this invention helps making the world a better and a cleaner place," says Nannerup.

Low energy consumption allows climate friendly air treatment
In scientific terms, Matthew Johnsons patented process is known as an atmospheric photochemical accelerator. The whole process is housed in five aluminium boxes on the roof of the Aarhus business. Compared to traditional methods the new process outshines by removing pollution rather than diluting it, as is the case when we send smoke up a chimney. The method requires no filters, so maintenance is inexpensive. It consumes very little energy, so its climate impact is negligible. Finally it removes the need for a chimney which would have been costly to erect. For all these reason INFUSER and the photochemical air-purification was the right choice for Jysk Miljoerens.

Photochemistry solved pressing problem for environmental business
The company Jysk Miljoerens makes a living separating oil from bilge water in ships, so that the oil may be recycled. For manager Bent Naldal all the parameters were important, but above all he is just happy that the new method has managed to remove the smells from his wastewater treatment plant. Because the smells were threatening to put him out of business.

"It's no big secret, that we've faced challenges in getting rid of the smells originating in our treatment plant. For this reason we were very happy when INFUSER got in touch, saying that they had a solution to our problem. Unlike other solutions that we've investigated to combat smells and air pollution we can now see, that INFUSER delivered. They've solved a pressing problem for Jysk Miloerens, and for the city of Aarhus," says CEO Naldal.

Perfect example of collaboration between industry and academia
For the University of Copenhagen it has been an especial pleasure to follow the collaboration between inventor and investor. The university unit for technology transfer has helped Johnson in the patenting process, in getting financing to conduct experiments and in drawing up the licensing agreement with INFUSER. Unit leader Anna Haldrup feels that the air cleaning technology is a perfect example of how universities can help industrial partners.

Find out more at: http://news.ku.dk/all_news/2012/2012.12/aircleaner/

Which this one run and run. Or, if for some reason it doesn’t, be on the look-out for some kind of conspiracy effect.

Generational Cycles – Protective Parenting In Extremis

It is often only when we observe extreme examples that we really learn what some of the generational characteristics first uncovered by Strauss & Howe are all about. It is, afterall, the extremes that best help to reveal the conflicts and contradictions that will ultimately act as the foundation for innovation opportunity. The following is what we think is a beautiful example of one of these generational extremes, the story of a GenX mother, writer Jane Gordon, reacting to photos her GenY student son posted on his Facebook page:

The picture I saw on my son's Facebook page could not be ignored. Taken in the run-down house Rufus shares with six other Leeds University students (all male), it revealed a dead mouse lying next to one of his trainers. It was clearly time to put aside my resolve to maintain a strict 'you've made your bed now lie in it' approach to his life as a student (though I knew his bed would have remained unmade — and the sheets unchanged — since term started in September) and revert to my old role as a 'helicopter parent'.

The next day I flew — well, drove — 196 miles up the M1 and did what mothers are biologically conditioned to do, whatever the age of their child. I disinfected, sterilised and decontaminated my 20-year-old's student house.

I loaded my car with everything I knew I would need — my own bucket and mop, my beloved Henry vacuum cleaner (and two spare bags), three pairs of Marigolds, six bottles of bleach, two packs of J-cloths, some heavy duty bin-bags and a wide assortment of products that claimed they had the power to banish mould, grease, lime-scale and go beyond the 'hidden bend'. I also took clean towels and sheets, and six Sainsbury's bags filled with fresh fruit, vegetables, shower gel, deodorant and vitamin supplements.

Finding the house wasn't difficult, but getting into it was a struggle. Mounds — no, mountains — of junk mail made it difficult to navigate my way through the hall and into the average semi that had been crudely converted into a residence with seven bedrooms, the fetid interiors of which brought to mind Tracey Emin's famous work, My Bed. Having had a 24-hour warning of my arrival, Rufus was dressed and had attempted to clear up, but most of his housemates were still sleeping. Well, it was only 1.30pm. Those not slumbering were lurking in the basement where the living area — known as 'the dungeon' — and the kitchen were located.

Rufus and his housemates — in every other way polite, charming, funny and intelligent lads — seem to be suffering from a condition dubbed by one psychologist as Student Squalor Syndrome. They display a kind of macho pride living among screwed-up crisp packets, odd socks, beer bottle caps and, outside one room, a bag containing the rotting bones of Kentucky Fried Chicken wings. Where would I start?

An hour later, having made my way down three flights of filthy stairs, filling several heavy-duty bin bags with abandoned socks and a depressing selection of underwear, Henry — his tubes blocked by the kind of debris rarely encountered by a domestic vacuum cleaner from a good home — and I broke down. Exhausted, frustrated and feeling almost as grubby as the house, I began to question why I was clearing up after my grown son (6ft 4in and still rising). Was I just giving into my maternal guilt and 'need' to be needed?

My friend Rosie, who found herself on a similar decontamination mission to her 19-year-old son's seven-man house in Newcastle, believes that while living in relative squalor has always been a rite of passage for students, the degree of filth today's undergraduates wallow in is our fault. 'When they were children, we pampered and over-protected them and, in the process, we failed to teach them the simple life rules about personal hygiene and nutrition that they need to know in order to lead healthy, independent lives,' she says.

As I attempted to clean the bathroom in my son's house with three litres of bleach, one bottle of drain cleaner and a flagon of 'black spot and mould remover', I found myself agreeing with Rosie. My generation has failed to pass on the basic life skills our mothers taught us. The chores my brother and I were expected to do during our childhood — laying the table for dinner, doing the washing-up and making our beds, however we resented it — gave us an idea of the work involved in running a home. When I became a parent in the Eighties, my life was so different from that of my own mother that after five years at home with my daughters, Bryony and Naomi (Rufus arrived a decade later), I joined the ranks of working mums.

My overriding maternal guilt not only made me indulge my girls materially with toys, it also made it impossible for me to ask them to do household chores. By delegating most of the domestic duties that I observed my mother performing when I was a child to a series of au pairs, nannies and cleaners, I now realise I failed my girls. But if I was neglectful in emphasising the importance of a clean and tidy house to my daughters, their brother was even more cocooned from the domestic realities of life, and now — in the filth of his student house — I was paying the price. By the time I reached the kitchen it was 4pm. The smell was overwhelming. The floor was covered in breadcrumbs, cornflakes and grains of rice, with the effect being rather like sawdust in a pub. The housemates, all now awake, were making their first meal.

Twenty-year-old Paul — known to the others as the Chef because of his ability to cook 'three things' — was broiling himself chilli mince on a gas hob that was covered in the burnt remains of many other meals. Meanwhile, my son, who is in the final year of a BSc in geography, and Dan, a 21-year-old psychology student, were preparing a nutritious Pot Noodle breakfast. While they ate — Paul and Dan simultaneously spooning down food and fighting it out over a game of FIFA on the games console — I quizzed them about the filth they were living in. Apart from the mice, which the boys assured me were 'more or less' taken care of by a family of feral cats living next door, had they suffered from other kinds of infestation?

'Well,' said Rufus cautiously, 'there was the scabies last year . . .' 'Scabies!' I squealed. This disease is caused by mites laying eggs under the skin and is now more commonly found in overcrowded Third World countries than in modern Britain. Worse, I knew that in adults the primary form of transmission came from sexual contact with an infected person.

Rufus explained: 'I promise you I wasn't infected, Mum — but all of us had to be treated with this horrible cream we had to smother over our bodies.'

'But why didn't you tell me?' I asked, horrified and already experiencing a little psychosomatic itching.

'Because if you've reacted like this over a dead mouse, what would you have done if you'd known about the scabies? You'd have turned up wearing a full-face respiratory mask and chemical decontamination suit and sprayed the house with hydrogen peroxide,' he said. He was probably right. When I left, the boys enthusiastically thanked me — not for the cleaning but for the Krispy Kreme doughnuts I had bought (the empty box was already abandoned on the floor). And while I made them promise to get the hoover out more than once a term, I had gained a certain pleasure from the day's chores. Because the hug my son gave me as I left and the text I later received ('Thanks Ma, you're the best, drive carefully') gave me the kind of warm maternal glow I experienced daily when he was a little boy and, like most mothers of grown-up children, still crave long after he has left home.

If it wasn't so scary, it might be funny. Protective parents, busy undoing the learnings of their heroically unhygienic offspring: no need to worry about dead mice in the bathroom, mum will come and sort it out.

One can only wonder what stories we might be hearing when the first of the next generation of 'suffocated' (as opposed to merely 'protected') kids makes it to college age and their Heroic parents go one step beyond the protectionism that Jane Gordon and her merely-protective generation have stooped to.

Biology – Rock Skipper Frog *(Staurois latopalmatus)*

Some creatures find their ecological niche living next to waterfalls. One of the benefits of a waterfall, particularly if you're an amphibian, is that there is plenty of water around. One of the problems is that life can be pretty noisy. What happens, in that case, when you live next to a waterfall and you want to let others know that, hey, this is your bit of waterfall and therefore they should stay away? Shouting at them probably won't do the trick because chances are you won't be able to make your voice carry over the noise of all the water. Flashing lights are expensive and not so well known in the natural world. Which pretty much leaves semaphore – the beautifully simple solution evolved in the Bornean rock skipper frog – as illustrated in the two video-stills above.

The full (15 second – it's not going to steal a big chunk of your day from you!) video can be found at http://evolvingcomplexityii.wordpress.com/2010/03/19/rock-skipper-frog-communication-by-semaphore/. It was filmed by University of Vienna students Doris Preininger and Markus Boeckle, who participated in a study in this unusual semaphore behaviour in 2009. Here's an excerpt from their academic write-up of the frog's story:

Acoustic signals are constrained by background noise. Visual signals are an alternative or complementary communication mode in noisy habitats and play a fundamental role in anuran communication. The Bornean rock-skipper frog, Staurois latopalmatus*, is a diurnal species living along fast-flowing streams and waterfalls. Males perform foot-flagging displays with either one or two legs to advertise their readiness to defend their territories. In quantitative video analyses of visual displays during 14 male-male agonistic interactions, totaling 106 minutes, foot flagging performed in the direction of the interacting male was the most common display and was performed at a higher rate than advertisement calls. According to a dyadic transition matrix, foot flagging was preceded by foot-flagging displays of interacting males. Advertisement calls were temporally coupled with foot flaggings and act as introductory components to direct the receiver's attention to the subsequent visual display. We conclude that foot flagging acts as a spacing mechanism and may have resulted from the ritualization of agonistic male behavior to minimize physical attacks.*

While it's not clear how sophisticated the semaphore signalling language is ('come home, your dinner is in the oven'?), what is clear is how the basic problem – 'I want to control my territory, but there's too much noise' – and its elegant solution can be mapped on to the Contradiction Matrix:

IMPROVING PARAMETERS YOU HAVE SELECTED:

Trainability/Operability/Controllability (34)

WORSENING PARAMETERS YOU HAVE SELECTED:

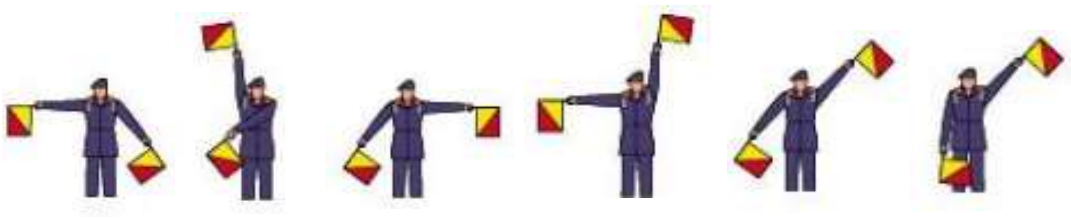
Noise (29)

SUGGESTED INVENTIVE PRINCIPLES:

2, 3, 31, 9, 35, 28, 18, 17

SYSTEM·ATIC INNOVAT·ION

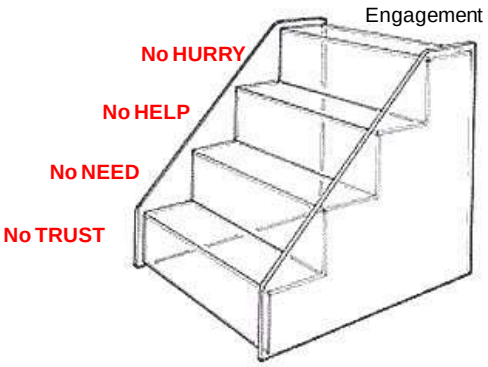
The semaphore (as opposed to auditory) signalling method represents an example illustration of Principle 28, ‘Mechanics Substitution’ in its ‘another sense’ guise.



Read the full paper in: Communication in Noisy Environments Ii: Visual Signaling Behavior of Male Foot-flagging Frogs Staurois latopalmatus. Doris Preininger, Markus Boeckle, and Walter Hödl. Herpetologica 65(2):166-173. 2009 doi: 10.1655/08-037R.1

Short Thort

Four Steps To Engagement…



“There are four key obstacles in any selling situation. The first, of course, is **trust**. Most people, when they meet a salesperson, start with a feeling of "I feel no trust." No one will let you persuade them to invest in anything if they don't trust you. So, you must work towards helping them think "I feel some trust here."

“The second obstacle is **need**. Most people, when you present a product or service to them in the beginning, say "I feel no need." Your job at this obstacle is to move them and change their mindset to one of "I feel some need" and, ideally, to "Boy, I really need this product."

“The third obstacle to overcome is **help**. Most people start off with "I might trust you; I might need the product, but I don't know if I want to invest in it with you." They may have a friend in the business, or they may know another company. No one ever wants to admit that they are helpless; however, you can help someone see that you provide answers in areas in which they may be not be as well-informed, because you are the professional and you know exactly what is best for them based on your experience. So, you need to change their mindset to one of "I want your help." They want you. You are part of the equation now.

“Then, the fourth obstacle is **hurry**. They may trust you, they may have the need, they may want your help, but now we have a challenge in a procrastinating society. They feel no hurry. Tie in with the word hurry the word urgency, because one of the keys to a great presentation is that we must create urgency throughout the entire presentation. Unless there is an emergency situation, no one is going to be in a hurry to purchase anything. Your job is to help them see that by taking care of the buying decision today, they'll be better off than if they wait. They need to think, "I feel some hurry here" in order to take action.”

Tom Hopkins

News

Institute for Continuous Improvement in the Public Sector (ICiPS)

We have been invited to give a keynote address at the ‘innovation’ themed networking event to be held in York on 12 February. The event is free, but prospective attendees need to register. More details at http://www.icips.org/calendar.

Graves Future Conference

Boy, if we thought organizing TRIZ conference events was difficult, turns out doing something in the Clare Graves psychology world is twice as hard. A massive thankyou to

all those presenters that delivered abstracts on schedule. While we continue chasing the others, we have regretfully had to re-schedule the event planned for the end of February to, what currently looks like the first or third week in May. Sincere apologies to those that had the original February dates locked in to their diaries. Hopefully, before the next e-zine comes out we will have a definitive May date. And a full programme of papers and presenters to make it an unmissable event.

Bye Bye Hannah!
No sooner does she run off and get married, office manager at our UK HQ, Hannah, has now upped sticks and moved to a different part of the country with her new partner. All we can say is 'an enormous thank you for all of your support and cat-herding efforts over the past five years, and we wish y'all well for the future. Be sure to stay on touch now.'…

Hello Cara
…some readers will already have encountered our new office cat-herder, Cara. She brings a wealth of teaching and organizing capability into her new role as Client Liaison Manager for the UK operation. Initially at least, Cara will be in the office on Tuesdays and Thursdays and, if subsequent months follow the same pattern as her first, answering emails at often quite strange other times. Feel free to write or phone to say hello… to offer condolences or other friendly advice.

2013 – Advanced Calendar Planning
Although the new year already looks a lot like 2012 for Darrell, travel-wise at least, there is a plan to chain jobs in different parts of the world together better in order to avoid some of the +5 to -6 to +8 time-zone oscillations. To that end, we already know some of the longer trips will occur as follows:

India – mid-February, mid-April
Australia – March (7-21), June (3-7 probably) and end-August
Malaysia – early July

Anyone located between(ish) any of these places and the UK wishing to meet up with Darrell might like to get in touch to see if we can build appropriate stops into the itinerary.

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

Healthcare – Anthropology/Engagement Workshop series
Medical Devices – Next generation product Customer Insight Workshop
Power Utilities – Problem Solving study
Automotive – Turnkey Design-Make Innovation project
Automotive – 'Eyes On The World' IP Study
Semi-Conductor – IP workshops
Oil & Gas – Strategic Study
Aerospace – Systematic Innovation Workshop series
FMCG – 'Rembrandt's' Identification & Ranking study