Systematic Innovation

e-zine

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Our guarantee to the subscriber is that the material featured in the e-zine will not be published elsewhere for a period of at least 6 months after a new issue is released.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

Customers Buy Outcomes: Outcomes Buy Meaning

(Or: Exploring The 'Will To Meaning')

From the TRIZ perspective, the thing that unites all innovation activities is Function. The only reason systems exist is to deliver 'useful functions' to – ideally paying – customers. Other innovation methodologies use the word 'job' or 'outcome' to effectively mean the same thing. Our customer outcome map template (Figure 1) is a way of bringing the various types of different function/job/outcome together for a given system. Specifically what this template is intended to bring to the story is the fact that any system involving humans needs to consider intangible as well as tangible outcomes ('a man makes a decision for two reasons: the good reason and the real reason' to re-use the J. P Morgan quote).

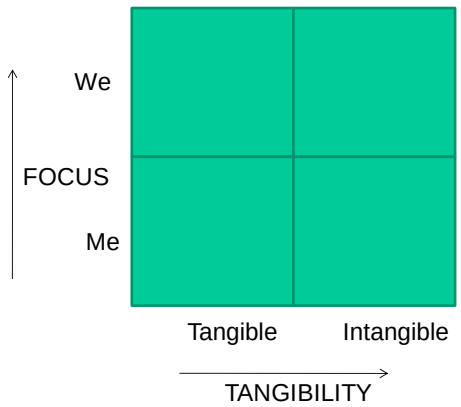


Figure 1: Customer Outcome Map Template

Edward Matchett, on the other hand, had a very different view about what customers want. The whole of the Fundamental Design Method is built around his 5M equation: 'Making Media plus Matter Meaningful in the Moment'. And at the heart of that equation is what he viewed as the ultimate reason why human systems exist: they exist to deliver meaning.

Meaning, in his definition, is not something incompatible with the function/job/outcome idea, but rather something that exists at a different level. (Human) systems, in other words, exist such that the outcomes they deliver in turn deliver meaning to people. As such, the customer outcome map might better be drawn as the picture shown in Figure 2:

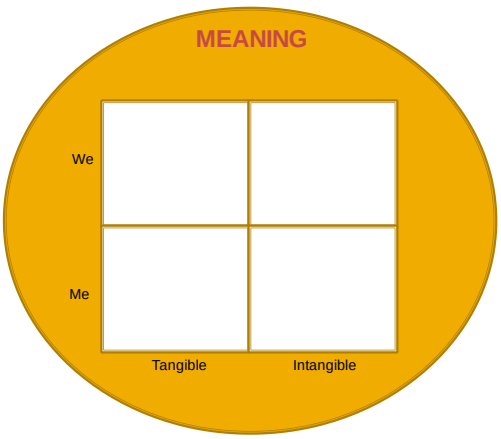


Figure 2: Customers Buy Outcomes Buy Meaning

What this picture is intended to imply is that whenever we work on a project, in addition to completing the outcome map, it is also necessary to spend some time thinking about the desired 'meaning' that a system should be aiming to deliver.

Hopefully, the main thing conveyed by Figure 2 is that 'meaning' is something that exists at a higher level than the tangible and intangible outcomes delivered by a system. In many cases, the intangible-we outcomes (e.g. 'piece of mind') are the ones that will sit closest to Matchett's intended interpretation of meaning. The simplest way to bring substance to what 'meaning' might mean for a project you are working on is to look at outcomes like 'piece of mind' and ask the question, '*why* does the person want piece of mind?' Answer that question and you are somewhere close to where Matchett and FDM would like you to be.

That said, one only has to take a relatively superficial look at the exercises Matchett set his students to see that he deliberately 'defined' meaning in rather abstract ways.

Here are the first parts of a typical early exercise to explore 'meaning':

ACQUIRING AND EXERCISING A WILL-TO-MEANING
Both the journey to FDM meta-control and the action of operating in that special mode require and demand a perfected will-to-meaning. No other will force is adequate for either of these purposes. Neither is it possible to exercise or make progress toward meta-control in any moment when a will-to-meaning is flawed. The acquiring and monitoring of a perfected will-to-meaning is therefore the highest priority in the Everest climb from talent to genius.

This particular self discipline has to be the core concern of all the work-on-oneself. Fortunately, it is a discipline that can be practiced in almost any circumstances, including those of relating to any existing or projected action or object. This particular series of tuning exercises focuses on the kinds of objects that most of us carry around with us or surround ourselves with in our homes, offices and leisure periods. Pick up [a magazine or source book containing plenty of product or design pictures] *to use as an exercise.*

Briefing
1. *As you flip through the pages of the book, record your impressions of the meaning content of particular designs or campaigns that your eyes light upon - especially ones that you judge to have either very high or very low meaning. Capture your meaning measurements and your criteria, logic and intuitions that produced your judgements.*
2. *Take a good look at the concept and details of one object from any section of the books - preferably an object that has some kind of special appeal for you. Consider carefully what change would need to be made to it in order that its meaning content should be magnified two, ten, fifty, one-hundred fold.*
3. *Select an object and attempt to define its fundamental meaning; that meaning which gives it its principal reason for existing. Then look at the way in which that fundamental meaning has been sympathetically and sensitively built upon ... or partially destroyed by clumsy/poor design. Make sketches and notes concerning what ought to - and needs to - happen to ensure that the fundamental meaning is held inviolate in all features, aspects and circumstances.*

Or how about this exercise to help students decide for themselves what 'meaning' means to them:

The WILL-TO-MEANING Alphabet

> *Choose a minimum of 26 words, (a maximum of 260), that serve to epitomise what meaning means for you. These words - words for each letter of the alphabet -need to be chosen exceedingly carefully in order that they shall, in their turn, serve you very well in the immediate recognition of meaning when you see it or experience it... and in the construction of thoughts, ideas, products, systems and services that possess an abundance of meaning. Be careful not to choose any words that you will not wish to bring to mind many times in the future. Each word that is chosen should be the key to unlocking memories, symbols, learning and deep understanding which you would long wish to hold on to and savour. Each word should declare to you a great deal concerning what meaning is in its essence, rather than how meaning might be sought and/or produced.*
>
> *If, for example, 'meaning is an orange' strikes an important chord in you, then '0 is for Orange' might well be a valuable inclusion. You might wish to often recall that meaning is synonymous with each and all of the eternal values. If this is the case, then 'B is for Beauty', 'G is for Goodness', IL is for Love', 'P is for Peace', 'R is for Reconciliation', 'V is for Virtue' ... and so on, may be some of the entries in your meaning alphabet. But each choice of word should be your own choice: one that seems exactly right for you and exceedingly important both as a point of recognition, and as the target you want in sight always as you engage in creative action in any field.*
>
> *You will doubtless recognise that in doing this search for appropriate key words - and then subsequently applying what they teach you and declare to you - constitutes a doing of work on your value system. Meaning cannot be seen and/or constructed when values are 'cock-eyed'; so this work is most important.*
>
> *When you are happy with your choice of words - really happy that is, to the point of being excited about them, eager to enthuse about them - then begin a process of compression. Take all of the crucially important essences and collect them into a phrase, a poem or a symbol that holds intact all these essences that you have chosen, but which makes them much easier to remember, to access and apply. When this process of compression, interlinking and refinement has been completed, you will have your Meaning Alphabet: indeed you will have achieved more than that; you will be it; your Meaning Alphabet will have become an integral part of the highly tuned state in which, and from which, and with which, you link with the world, enjoy it and respond creatively to it.*

Meaning, according to Matchett, is ultimately a very personal thing. Successfully tapping into it, however, presents an enormous innovation opportunity. The market for meaning is infinite.

The Tigger/Eeyore Contradiction

Innovation continues to be one of the most difficult of all organizational activities. Almost every organization struggles with some aspect or other of the many things that all have to be executed perfectly if a new product or process, service or solution is to have any chance or repaying the investment needed to transition from idea to money. It's one of the reasons we're in the process of launching the Innovation Capability Maturity Model (ICMM). The single biggest reason why innovation attempts fail is because the organization lacks the requisite qualities and capabilities to conduct what needs to be conducted. Right at the heart of those 'qualities and capabilities' are the people within the organization. Get the people-stuff wrong, and kiss goodbye to your hard earned R&D dollar seems to be Rule One of any innovation project. No matter how good the idea might be.

As is often the case when dealing with senior organization leaders, it is a good idea to keep things simple when trying to broach the innovation-versus-people problem. 'Simple' in turn pretty quickly tends to head in the direction of a 2x2 matrix. Cliché or otherwise, the best thing about any good 2x2 matrix, though, is that at the very least it gets people thinking about important contradictions.

Figure 1 illustrates the 2x2 matrix we think lies at the heart of the innovation and people challenge. The two orthogonal axes of this matrix describe the two key traits of an individual's ability or otherwise to 'do' the innovation job: firstly do they have the skills to successfully create and cement step-changes, and secondly do they have the motivation to stick with it when times get (inevitably) tough?

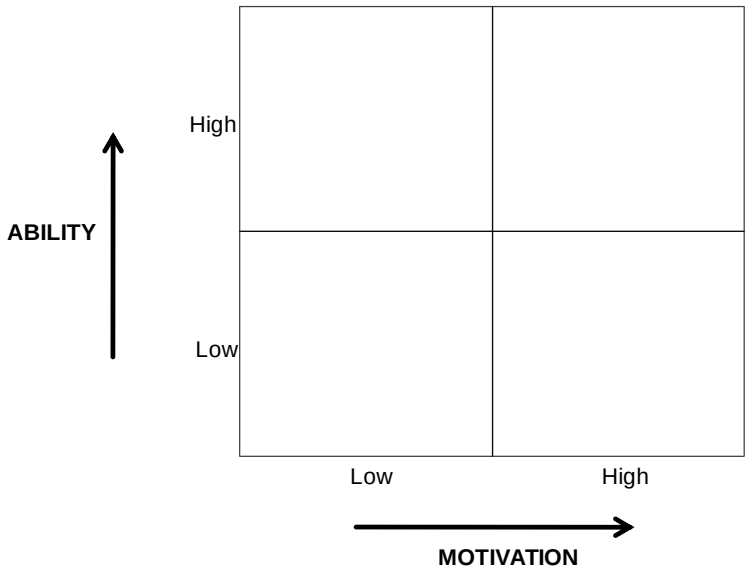


Figure 1: The Innovation Ability-Motivation Matrix

As is always the case if we define the axes of the matrix correctly, the place we'd like people to be is up in the top right hand quadrant. This is the box that requires us to have resolved the contradiction between the two orthogonal axes. In this case the one between the ability to innovate and the motivation to innovate. Why are these in any kind of conflict you might reasonably ask yourself. Although, if you don't know the answer, it's probably

because you don't work in one of the probably half-dozen or so organizations on the planet that have seen both sides of the story.

First up, as the TRIZ community knows all too well, there aren't that many people around with a real innovation ability. And those that do exist often find themselves either frustrated or away in some peripheral role in the organizations that 'put up' with them. Any of these people that has successfully stuck with an innovation project to its successful conclusion tend not to want to have to do it again. Because it was tough, often soul-destroying work where it often felt like you were dragging the rest of the organization kicking-and-screaming towards something that only you could actually see was the right direction. Pushing rivers is hard work, and the smart innovator quickly learns that it's better to sit back and wait (or go to another organization) rather than do even more of that pushing.

In looking around for the right labels for each of the four quadrants of our innovation ability/motivation matrix, the best image for the battle-weary innovator is Eeyore the tail-losing donkey from Winnie-the-Pooh. Eeyore is one of the most intelligent of the book's characters. Experience, however, has taught him it is better to keep things to himself. Smart as he might be, he is not exactly the 'go-to' guy when it comes to starting anything new.

The other Pooh character that seems to fit the matrix well is Tigger. Tigger is always in an electrifying & exuberant mood and loves to bounce, bounce and bounce. His character is easily recognizable by the black & orange stripes, a springy tail, and a long chin, beady eyes which all mix well into his bouncy and fun loving personality. He is a "bouncy, pouncy, flouncy and a trouncy creature that is always looking to make the most out of what life has to offer. The most wonderful thing about Tiggers is that "I'm the only one!" Tigger likes to bounce a lot, "cause that is what Tiggers do best." His favourite food is the extract of malt but is known to be an extremely fussy eater. He takes a lot of pleasure in being able to "unbounce" some of the other animals in the 100 Acre Wood". He represents the high motivation, low ability quadrant of the matrix – Figure 2. He's like a lot of bright-young-thing, new-by project managers in organizations: keen to make a difference and an unmitigated disaster when it comes to getting things right. He gives new meaning to the Tiger Team. Tigger Teams, anyone?

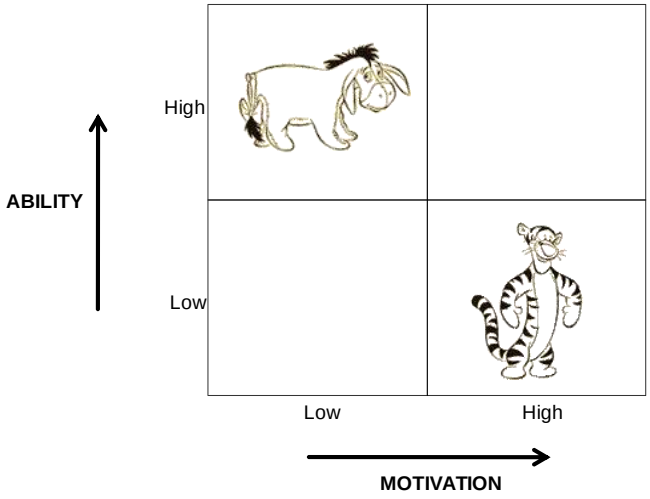


Figure 2: The Winnie-the-Pooh Version Innovation Ability-Motivation Matrix

Together, Tigger and Eeyore seem to define the ability-motivation conflict better than any other analogy we've thus far been able to devise. Both are useful additions to the 100 Acre Wood, but neither by himself is going to be any great use when it comes to the

innovation challenge. Which, I suppose, begs the question whether any of the other Pooh characters do? The answer is probably not:

Poor old Pooh probably sits most comfortably in the bottom left quadrant of the picture. He's definitely a bear 'of little brain' and, honey-aside, his motivation in life is also pretty questionable. Hmm. Equate honey to money (is that what A.A.Milne had in mind?) and he's probably a fairly close model for a lot of project managers in large organizations. Possibly.

Owl, on the other hand is probably the smartest of the other characters. Along with Rabbit he is considered to be an animal with brains. His intelligence is often called upon to aid a certain bear of very little brain. He is always forthcoming in offering his advice, opinions and anecdotes irrespective of others wanting it. He also loves telling stories related to his relatives. His original residence is called The Chestnuts but when a storm blows away his house he makes Piglet's residence his new residence. His residence has amenities like a pull- bell and a door knocker. Owl is capable of writing and some illustrations show him holding a pen in his talons. On the other hand, it never seems quite clear that he is able to bring the other characters of the book along with him. Indeed they seem to consider him as rather pompous if not a bit of a bore. While he certainly has ability, and more of a will to get on and do things than Eeyore, he really doesn't have the right contradiction solving skills when it comes to the (inevitable) job of bringing others along on the innovation journey. Nope, Owl doesn't help us. He's definitely present in a lot of innovation teams (usually of Russian origin ☺), but… let's leave it at that.

Next up we have Christopher Robbin. He's definitely a go-to guy when it comes to being the best friend, and although he manages to solve a bunch of problems, you'd have to say the nail solution for Eeyore's tail hardly counts as breakthrough. He's definitely in the innovation cast of characters, but he's not our contradiction solving guy either.

Piglet scores well on the bravery front, but as the physically smallest character in the book, he's definitely lacking on the ability axis. Kanga is a great mother – also an important innovation trait at certain times – but again definitely not happy in the top right quadrant. Rabbit is "quite certain about the important things in his life. What he likes doing most is organizing a plan and to lead group events, even if nothing gets done. He is unhappy if anyone disturbs or interrupts him while he is engaged in any kind of activity though so also fails our top-right test." Nope, doesn't quite sound flexible enough. Plus the name 'rabbit' is never going to carry the right mental image for what we're looking for in our contradiction.

Which all seems to suggest that our mythical contradiction-beater doesn't exist. Or maybe the person we're looking for is A.A. Milne himself? Maybe that was the point of the stories? You've got to be able to stand back far enough from the story to be able to see the contradiction, but then also have the quiet authority to ultimately make sure the job gets done. And maybe, then, make sure you have the right combination of characters.

Figure 3: A.A. Milne

"Promise me you'll always remember: You're braver than you believe, and stronger than you seem, and smarter than you think."

Humour – Honest Logos

The company logo as come to define much of the intangible value of any organization these days. The UK advertising agency tellingly calls them 'love-marks'. So far so good. Until skeptical consumers decide otherwise… these images from the rather wonderful Designers Couch website:

Or how about this collection from the world of FMCG:

Our personal favourites, however, have to be this pair of unconnected beauties:

Together defining the spectrum of honesty – from the very subtle, to the not. Somehow, a trip to Stuttgart will never quite seem the same again.

Finally, not from the Designers Couch, but rather somewhere ultimately much more sinister, here's one from P&G:

Err, wait a minute, wrong idea completely. Which is probably what the guilty advertising agency should've been told. P&G and the Olympics? Could you run that one by me again?

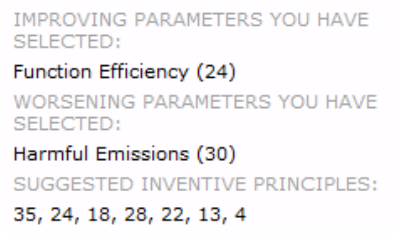
SYSTEM·ATIC INNOVAT·ION

Patent of the Month – Antimicrobial Combination Therapy

Our patent of the month this month takes us to a joint team of inventors from MIT and the University of Massachusetts. US7,943,600 was granted on 17 May. The invention disclosure reveals the following background to the invention:

The emergence of bacterial resistance to tetracyclines, a broad class of antibiotics, has led to a decline in their use against infectious diseases. Due to the development of resistance, tetracyclines are no longer used in the treatment of many conditions where they were the drugs of choice. Dozens of bacterial diseases were once treated with tetracyclines, and that number is now reduced to only a handful. In those instances where tetracyclines are still used, or even are currently the drugs of choice, the possibility still exists for rapid development of bacterial resistance to this class of antibiotics. This is an unfortunate turn of events, because tetracyclines are broad-range, inexpensive and safe antibiotics that show good oral absorption. Moreover, the development of tetracycline resistance in some instances may come along with the development of concurrent multiple-antibiotic resistance, and alternative antibiotics also may become ineffective in such cases. Therefore the need for new antimicrobial regimens addressing the problem of antibiotic resistance is acute.

All in all an excellent and concise description of the tough and increasingly prevalent contradiction in the field of medicine: the arms race between medicines and the bacteria they are required to treat. This is a fairly difficult problem to map onto the Contradiction Matrix since there is no direct connection to either improving or worsening features. Here's how we think the problem is best suited to the parameters available in Matrix 2010.

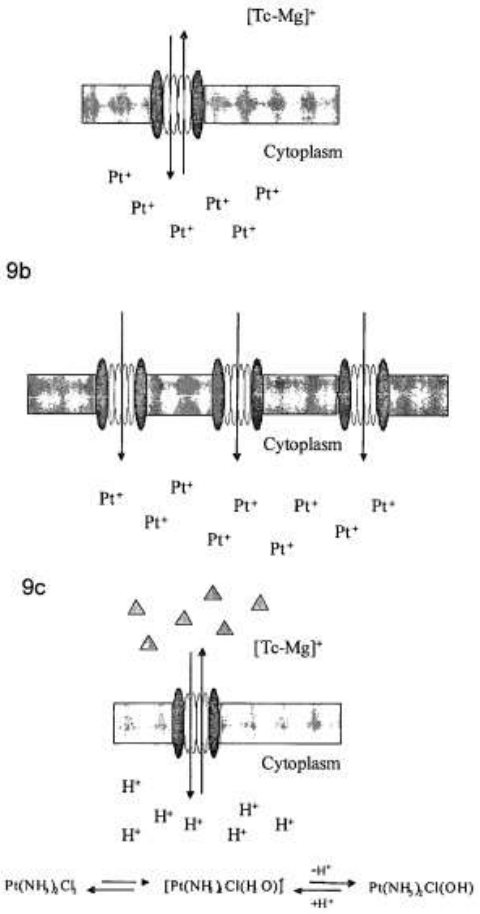


And here's how the inventors summarise their invention:

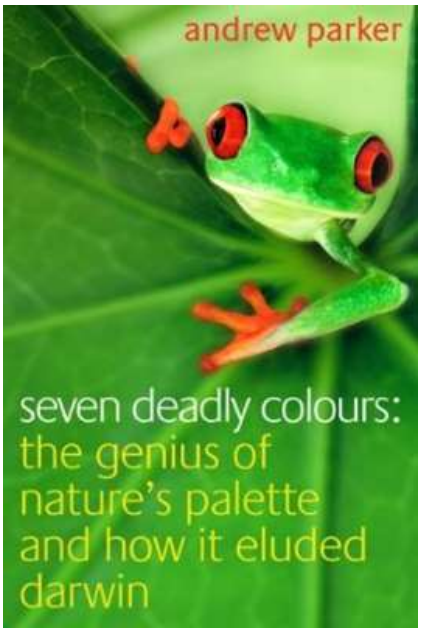
Aspects of the invention relate to antimicrobial compositions and methods. Aspects of the invention are based, in part, on the discovery that the effectiveness of certain toxic compounds (e.g., alkylating agents, and/or nucleic acid damaging agents, and/or heavy metal containing compounds, and/or chelating agents or complex forming compounds) against drug-resistant microbial cells is greater in the presence of an antimicrobial agent. In one embodiment, the effectiveness of a toxic compound may be greater in the presence of an antimicrobial agent that the microbial cells are resistant to. Accordingly, certain antimicrobial agents may sensitize a drug-resistant microorganism to the effects of one or more toxic compounds.

Aspects of the invention relate to synergistic effects obtained when one or more antimicrobial agents are combined with one or more toxic compounds. Aspects of the invention also relate to synergistic combinations of antimicrobial agents and toxic compounds. As used herein, synergistic refers to a therapeutic effect greater than the therapeutic effect of either agent or compound used alone. In one embodiment, aspects of the invention include combinations of one or more antimicrobial agents with one or more nucleic acid damaging agents (e.g. DNA damaging agents). In another embodiment, aspects of the invention include combinations of one or more antimicrobial agents with one or more alkylating agents. In a further embodiment, aspects of the invention include combinations of one or more antimicrobial agents with one or more heavy metal containing compounds (e.g., heavy metal salts). In yet another embodiment, aspects of the invention include combinations of one or more antimicrobial agents with one or more chelating agents or complex forming compounds. It should be appreciated that aspects of the invention relate to combinations of two or more different types of toxic agents along with one or more antimicrobial agents.

All in all a very clear illustration of the not-often-found Inventive Principle, 22, Blessing-In-Disguise or Turning Lemons Into Lemonade. A very nice realization that previously rejected antibiotic bases are able to be revived by making synergistic (an excellent word to use to search for high quality inventions very often) use of ‘toxic’ elements.



Best of the Month – Seven Deadly Colours



Our selection this month was actually published in 2005, so first up an apology to all that it took us so long to recognize the real value of Oxford University professor, Andrew Parker's wonderful contribution to not only biology, but also the very TRIZ-like world of colour-as-a-resource.

The book forms the second part of a trilogy on the evolution of vision, all of which seems to stem (although I suspect the publisher is more drawn to the Darwin connection than Parker) from 'Darwin's nemesis' the evolution of the eye. This from the foreword to the book:

'To suppose that the eye ...should have formed by natural selection, seems, I freely confess, absurd in the highest degree' -- thus wrote Charles Darwin in ON THE ORIGIN OF SPECIES. The eye's 'perfection', he found, was the one problem he could not resolve with his theory of evolution by natural selection: no intermediate stages between a non-eye and a working eye seemed possible. But was he right? Taking the colours of the spectrum as his keys to the natural world, Andrew Parker shows us that Darwin in fact had no reason to worry, and that Nature's palette is a far more miraculous thing than we had previously imagined. With vivid and fascinating examples of how colour has affected flora and fauna in different environments across the globe, SEVEN DEADLY COLOURS not only shows the endless wonder of the natural world but also extends our understanding of evolution itself.

The bulk of Seven Deadly Colours spins around the seven colours of the spectrum, with one chapter per colour. Each chapter begins with a problem – e.g. Chapter 1, Ultraviolet, why do kestrels hover over motorway verges, where their prey is well camouflaged? – and then weaves a usually pretty wondrous and compelling story as to how that particular colour contains the answer. All in all a fascinating read and an excellent complement to anyone that wishes to become more aware of how profoundly important colour can be as a problem solving resource. There aren't many areas where nature does better than human engineers these days (maybe surfaces, mechanical structures and chemistry are the big three), but colour as yet is still one of the ones where we have a deal of catching up to do. If you're one of those people that inwardly groans every time the Contradiction Matrix tells you to go and have a look at Inventive Principle 32, here's the book to change your mind. As Andrew Parker knows, you should actually be rubbing your hands with glee.

Conference Report – Innovate To Success

This high profile event took place on the 9th May 2011, at The Cumberland Hotel in central London. In all over 160 people were in attendance. A fairly impressive number considering that 9 May was first of all a Monday and secondly a public holiday in most countries in Europe. Even more impressive was the fact that almost everybody stayed right through the proceedings from beginning to end.

Seemingly everyone's talking about Innovation, companies are spending millions on it, but what do you really get out of it? Is it just the latest buzzword? The big theme of the event was the perennial CEO question, 'how do I get a greater return from innovation?'

An audience of CEO's, CTO's, COO's, CFO's, business strategists and executive decision-makers from all industry sectors joined together to understand how innovation is a valuable and intrinsic component of business success.

This, what we expect will become annual, event provided business leaders with practical insights on ways to enhance their own business programmes. Attendees had an opportunity to interact with the expert panel from across the innovation, leadership and business strategy worlds.

Key sub-themes then included:

1 - Understanding the art, science and behaviour of innovation:

- Why 97% of all innovation attempts fail
- Predicting the future at a product, business and societal level
- Assessing and exploiting the untapped potential of your business
- What the world's largest innovation database can tell us about business success

2 - Translating the art, science and behaviour of innovation into a winning business strategy:

- How Samsung and P&G have become the world's leading innovators
- Staying one step ahead of the competition by exploiting future trends
- Accelerating the innovation and transformation process in your business
- Insuring your business against disruptive change

3 - Enabling your business' innovation capability to achieve greater return on investment

- Encouraging relentless challenging of the status quo
- Extending innovative behaviours right across the business
- Ensuring future orientation and a common purpose

4 - Leading a transformational strategy

- How great leaders inspire innovation and change
- Adopting an entrepreneurial mind-set.
- Role-model the art, science and behaviours necessary for successful innovation
- How to balance creativity with commercial viability

The speakers for the day represented a cross-section of the great and good of the world of innovation. Ahem, plus us:

William B. Bonvillian, Director at MIT

Since January 2006, Mr. Bonvillian has been Director of the Massachusetts Institute of Technology's Washington, D.C. Office. At MIT, he works to support MIT's strong and historic relations with federal R&D agencies, and its role on national science policy. Bill is well-respected within US government circles as he spent 17 years as a senior policy advisor in the US Senate. He is a prolific author on innovation with a book and numerous articles to his name. *A recognised expert on US governmental innovation Research and Development.*

Craig Wynett, Vice President and Chief Learning Officer at P&G

Mr. Wynett's career at P&G spans more than 23 years. Under his leadership within Corporate New Ventures Organisation, many of P&G's most successful new products have been produced, including Swiffer®, ThermaCare®, and Press & Seal®. Craig is also the mastermind behind the 'You' series of books that live at the top of the New York Times bestseller list. Craig is recognised as one of the top 5 leaders in innovation globally. In his bestselling book The Game Changer, P&G ex-CEO A.G. Lafley describes Craig as "… one of the most provocative, out-of-the-box thinkers about innovation I have ever met." *Listed as one of the world's leading innovation thinkers and one of the drivers behind P&G's pre-eminence in innovation.*

Liz Mellon, Executive Director at Duke Corporate Education

A leading business educator, Dr Liz Mellon works with many of the FTSE100 CEOs. Considered one of the world's foremost authorities on leadership development, she has also contributed to the development of public service leadership through her early research and teaching interests. Some notable clients include The New York Times,

HSBC, Shell, The UK Foreign Office, PricewaterhouseCoopers, Deutsche Bank, AstraZeneca, GlaxoSmithKline, BP, Novartis, Credit Suisse First Boston, Rio Tinto, BNP Paribas, Unilever, United Business Media, Rolls Royce, Atlas Copco and the Standard Bank Group. Her forthcoming book on CEO development, The Leadership Mindset: Five Ways to Think Like a Leader, will be published by FT Prentice Hall in April 2011. *A global expert on leadership and author of leading publications on the leadership mindset needed in the New Global Economy.*

 **Hugo Bagué, Group Executive - People and Organisation at Rio Tinto**

Mr. Bagué is a true strategic Human Resources businessman that has worked in multiple countries for some of the world's largest companies including Nortel, HP and Abbott Laboratories. A keen linguist, Hugo is fluent in several languages. *A recognised global expert on the development of talent strategies for current and emerging economies.*

 **Maurice Duffy, Chief Executive Officer at blackswan**

In his current role Mr Duffy is responsible for all of blackswan's transformation programmes based in 23 countries and operating globally. He has published articles on cutting edge management and is respected for his work on leadership, coaching and mentoring, in which he both practices and consults around the world with some of the key leaders in industry. *A leading global business transformational expert.*

Event chairperson

 **Alastair Campbell**

Alastair is a writer, communicator and strategist best known for his role as former British Prime Minister Tony Blair's spokesman, press secretary and director of communications and strategy. Still active in Labour politics, he now splits his time between writing, speaking, charitable fundraising, politics and campaigns.

Often controversial, and always prepared to speak his mind, Alastair is a sought after public speaker in Britain and abroad. Drawing on his experience of ten years alongside Tony Blair, and his considerable understanding of the modern media, he specialises in strategy, making change, dealing with the media and crisis management – often at the same time.

Dozens of testimonials from a wide variety of businesses, organisations and conference organisers have paid tribute to his skills as an engaging and innovative speaker able to apply his insights and experience to the work of others with wit and passion.

Delegate feedback at the end of the event was quite simply the most complimentary this frequent conference-go-er has ever seen. The speakers regularly hit on not just the mood of the times, but managed to deliver insight after insight about why innovation is traditionally so difficult. And why it doesn't have to be that way.

Let's leave the feedback of one CTO delegate as our final thought:

"Learning something new is often a double-edged sword. On the one hand we can dismiss entirely the wrongheaded notion that that which you do not know cannot hurt you. In reality it is always that which you do not know that hurts you. On the other hand, the act of learning frequently requires that you unlearn something you once held true. This can be a painful experience, especially if that former truth is something you've built a career on or, even worse, a reputation. But from time to time you learn something new which not only enlightens your worldview, potentially saving you from a great deal of pain later on, but also re-enforces what you already knew. Such was my experience at Monday's Innovate to Success conference."

Investments – Heliswirl Stent

Imperial College spin-out, Heliswirl, has long been one of our favourite examples of the often counter-intuitive nature of some of the TRIZ trends. Namely in this case the geometric evolution trend away from things that are straight to things that are curved. The trend is counter-intuitive because the benefit of making such a jump is not always obvious. Most people seeing the heliswirl tubing (pictured above) for the first time assume that it is merely a more expensive to produce version of a normal straight tube. Experience tells us the real benefit is that the pressure loss through the swirl tube is up to 75% lower than the loss through an equivalent length of straight tubing.

Now, the Imperial team have found what feels like another very elegant application for the swirl idea: the coronary artery stent. For those that don't know this multi-billion dollar industry, stents are flexible tubes of medical-grade metal that are inserted into the blocked regions of veins and arteries, inflated so the offending blood passage is returned to its full diameter, and left in place so the patient is able to live a normal life again.

Interestingly, the heliswirl idea first grew out of the study of flows within things like veins and arteries – which are indeed often twisted and convoluted along their length. A major outcome of the long-term studies into arterial blood flow undertaken by Professor Colin Caro was the discovery that the helically twisted shape of arteries forces blood to swirl and cross-mix rather than flow straight ahead, thus reducing the development of vascular diseases, especially atherosclerosis (hardening of the artery wall caused by the accumulation of fatty deposits) which is a leading cause of heart attacks and strokes. This discovery has a wide range of potential healthcare applications and has also now led to bio-inspired industrial solutions.

Working with Imperial Innovations, Professor Caro set up HeliSwirl, to apply the principle of swirling and cross-mixing to the piping of industrial fluids, including multiphase fluids, such as commingled gas, oil and water. He has now set up a second spin-off company to capitalise upon the commercial benefits of his research, this time returning to the original source of inspiration for the swirl idea: veins and arteries.

Veryan Medical Limited has developed and commercialised a new type of stent based on its patented BioMimics 3DTM technology that is inspired by the natural shape of the large blood vessels. The spiral shaped stents generate swirling and cross-mixing of the flow, mimicking the natural motion of the blood. Trials have shown the stents not only to

suppress disease development but also to be more flexible and durable than conventional stents, thus reducing costs for healthcare providers and the amount of time patients need to spend in hospital.

Recent in-vivo studies in a porcine model have demonstrated a dramatic reduction in restenosis (the process by which implanted stents narrow and eventually block) using a BioMimics 3DTM design compared to existing stent technologies. In further studies, BioMimics 3DTM stent technology demonstrated superior mechanical performance compared to conventional designs. Assuming they can find a decent route to market, we think they stand a pretty good chance of making a pretty big name for themselves.

Generational Cycles – Enviga

When the scientists at Coca-Cola and Nestle finished developing the Enviga 'negative calorie drink' technology, you can imagine there was all around jubilation and hands rubbing with glee at the thought of the year-end bonuses. With 25% of the global population now officially classed as clinically obese, and the number looking set to continue rising for the next few years, a soft drink that 'burns fat' looked like an answer that couldn't fail.

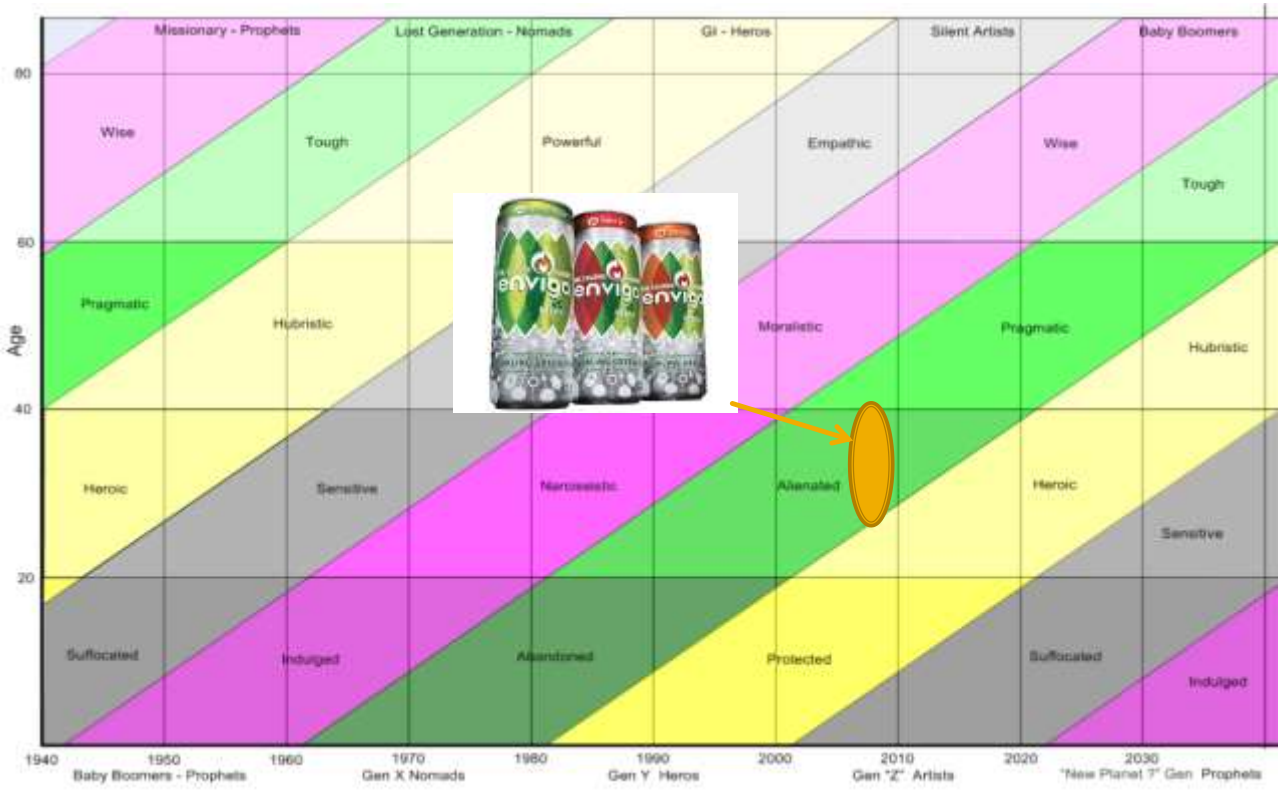
Indeed, that's the way the management at Coca-Cola must've seen things when Nestle invited them to launch the drink, now called 'Enviga', as a joint venture. That was the end of 2006. The drink was launched nationally in the US in early 2007. It reportedly tasted pretty good.

Roll forward to 2010, when the project was halted and Coca-Cola reportedly poured three million unsold cans of the stuff down the drain. Which has to beg the question how can two of the biggest, most successful organisations on the planet take, what seems on the surface to be a 'wow' product fitting all the prevailing social and market trends, and end up losing their shirts?

Whether or not we'll get to hear the real story, the failure of Enviga seems to us to be strongly symbolic of the innovation world. It's a world where we might execute 999 steps in our innovation processes flawlessly, get one step wrong and because of that one thing, end up losing our money. It's a really tough problem. One of the toughest encountered anywhere because it demands that we embrace the inherent complexities of the world today. Taken as a global average, fewer than 1% of all innovation attempts will end in any kind of commercial success. A fact that most likely makes innovation the cruellest game on the planet.

Cruel, maybe, but not impossible. There are undoubtedly multiple reasons behind the failure of Enviga. But there is also, we think, one very big one. It's a reason that lies right at the heart of the Strauss & Howe generations story. Enviga was a drink aimed at a pretty specific age group – people in their late-twenties and early thirties. People, they thought, that were just reaching that age when the pounds were beginning to accumulate and weight was becoming an issue.

Except, here's what the story looked like when plotted on one of the Generations maps:



Spot the problem?

Look across all the archetypes and their characteristics at each of the different key stages of life, and it's not possible to make a choice much worse than Alienated Nomads. But that's exactly the age-group that Coca-Cola and Nestle found themselves dealing with. The most skeptical, you-say-left-I'll-go-right generation of them all.

Here was a generation that, exposed to any kind of message that sounds too good to be true – even if it is true – not only automatically assumes it isn't, but, curse them, they will go out of their way to prove it isn't. Less than three months after the launch of the drink and there are already half a dozen Nomad-authored blogs playing the evil-MNC game.

Frankly it almost didn't matter how good Enviga tasted or how many calories it burned, the simple truth is it was just marketed in the wrong way to the wrong people.

Try again in about four years time, with a slightly younger crowd, though, and the story very probably shifts completely the other way. The only real question now is, will the management of either company be willing to throw the hat into the ring again?

Biology – Fire Ant

Did you ever wonder how a colony of ants could survive a flood? It turns out the Brazilian fire ant, *Solenopsis invicta*, manages the trick by self-assembling into hydrophobic rafts made of thousands of individual ants. These rafts can remain afloat for days at time without drowning the individual ants.

It turns out that individual ants are hydrophobic, or water repelling. However, the ants are slightly denser that water so they must rely on surface tension to remain above the water. Surface tension only works for relatively small objects, so how can a raft of thousands of individual ants remain afloat?

The ants can form a small pocket of air around their bodies called a plastron. In large groups, such as in the raft, the plastron can grow even larger, decreasing the density of the raft up to 75 percent. The plastron keeps the water out of the raft and also provides air for the ants below the waterline to breath.

To see how the raft was held together, the researchers froze ant rafts with liquid nitrogen and imaged them with an electron microscope. The ants held onto each other by hooking their feet together and by gripping each others' legs with their mandibles. This allows for strong but non-permanent attachments.

When the ant raft is perturbed or submerged, all the ants contract their bodies in unison. This contraction shrinks the raft and strengthens it in the process. The contracted raft also holds the plastron tighter, allowing the raft to be submerged several centimeters without significant loss of air.

These ant rafts are self-assembling as well as self-healing. A mass of ants dropped into water will form a raft within a few minutes. Removing an individual ant from the raft and the rest of the ants will rearrange themselves to fill the gap. The researchers note that these behaviors are some of the characteristics of a living super-organism.

From a conflict resolution perspective, the basic problem the ants have solved here involves the ability to survive floods (safety), and the thing they have had to overcome is the fact that they are more dense than water and therefore, individually, tend to sink. Here's how we might map the problem on the Contradiction Matrix:

IMPROVING PARAMETERS YOU HAVE SELECTED:

Safety/Vulnerability (38)

WORSENING PARAMETERS YOU HAVE SELECTED:

Weight of Moving Object (1) and Force/Torque (15)

SUGGESTED INVENTIVE PRINCIPLES:

13, 31, 8, 17, 30, 19, 3, 12, 14, 40, 7, 26, 24

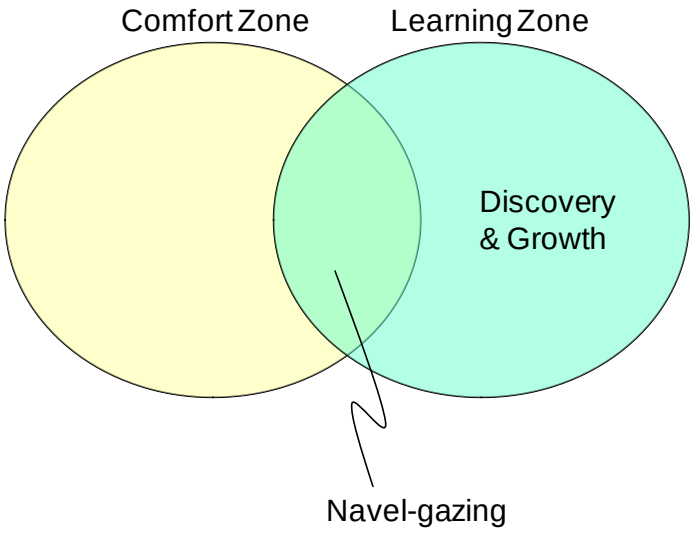
Which, all things considered, mimics the combined ant strategy pretty well:

a) Principles 31/30 – formation of plastron air-bubbles…
b) Principle 8 - …to create an anti-weight force
c) Principle 3 – use of a hydrophobic surface

For completeness' sake, we might also wish to consider the fact that the ant solution also makes use of Merging (Principle 5) and, perhaps most cunning of all, Dynamics (Principle 15) to contract the raft when subject to disturbance.

All in all a quite remarkable example of collective behavior solving a tough problem. Something pretty close to a wow solution if ever we saw one. Fire ants, we salute you.

Short Thort



News

TrenDNA
We are pleased to announce a new re-print of the now sold-out first edition of the TrenDNA book. This time around we've printed extra copies of the book part of the package for those people that don't want to purchase the whole set with fold-out sheet and trend cards.

TrenDNA b2b
Apologies for the delay in publication of the B2B version of the TrenDNA book. Anyone attending the UK TRIZ Forum in May will know the reason for the delay is the emergence of a new technical finding that we felt shouldn't be kept out of the book. With a following wind, the final version will be published in July. Ahem, 2011.

ETRIA Conference
We have had two papers accepted for the big European TRIZ event of 2011, to be held in Dublin from the 2nd to the 4th of November. The intention it to be in attendance to present both. And hopefully convene a SI Network meeting during what we hope will be the same trip for everyone.

UK TRIZ Forum #3 Proceedings
This year's event passed off successfully with an almost full show of presenters and papers. As per previous years, those that weren't able to attend can purchase a CD containing the presented papers and slides. The price is 25GBP plus shipping. To order a copy, please get in touch with Hannah (@systematic-innovation.com).

Whispered Voices
We will be running a public two-day Whispered Voices (TrenDNA) event in London on 22-23 June. Very likely the last public event before the summer silly season. Expect more public events when schedule normality returns in September and October. Details on the website.

DTU Innovation Camp
20 and 21 June sees us in Denmark as a part of the Danish Technical University 'Innovation Camp' programme. In simple terms, 100 students arrive from arrive the world to work on challenges and problems of their own devising. We're there to bring some structure to the event and to hopefully help take some of the solution ideas to a higher level of completion. Expect a write-up in a future ezine.

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

- Automotive – problem solving consulting project
- Aerospace – management & strategy innovation workshops
- Medical Devices – strategic study
- Medical Devices – turnkey design/prototype/patent study
- ICT – technology foresighting study
- FMCG – IP study
- FMCG – Asset sweat study
- Telecom – workshop series
- Energy Utility – IP study
- Pharma – management innovation ideation sessions