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Our guarantee to the subscriber is that the material featured in the e-zine will not be published elsewhere for a period of at least 6 months after a new issue is released.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

Starters, Finishers & Everyone Inbetween

I think I've only ever visited one enterprise where lack of ideas was a genuine problem. And yet, somehow, senior managers and (worse) the million-and-one creativity consultants infecting the planet seem to think that's the reason so little innovation emerges from project teams. Now, granted, I have occasionally seen organisations where there is a dearth of 'good' ideas', but invariably those are situations where people have been forced to work on the wrong problem. Give these people the 'right' problem, and a swathe of great ideas will invariably emerge in very short order. Lack of ideas or lack of idea generation capability are not the problem.

Some, myself included, might go so far as to say the real problem is too many ideas.

Which in turn means 'too many Starters'. Starters are people are very happy to generate as many new ideas as you will give them the time to generate. In ICMM Level 1 organisations, they're often known as the 'viruses'. The people that ask all the awkward questions that only seem like distractions to those tasked with operating the 'real' organisation. The reason Starters are often viewed in this way is because they tend to get bored or run out of steam. There's always a better problem or a better idea as far as Starters are concerned.

Put the other way around, perhaps the real innovation problem inside most organisations is the relative lack of Finishers. The people, in other words, that the Starters can hand their half-baked ideas over to and who will then be willing and capable of executing to a point where they consider it properly 'finished'. Finishers do perspiration work.

If Thomas Edison was anywhere close to right in his assertion that innovation is "1% inspiration, 99% perspiration", that should somehow be reflected in the relative numbers of Starters and Finishers inside an organisation: for every Starter there should be 99 Finishers.

Look at the reality, however, and the ratio is usually very heavily biased in the other direction, the number of Starters far outweighing the number of Finishers. Here's the (generalized) results of a recent assessment we did on Starter/Finishers inside one of our client organisations:
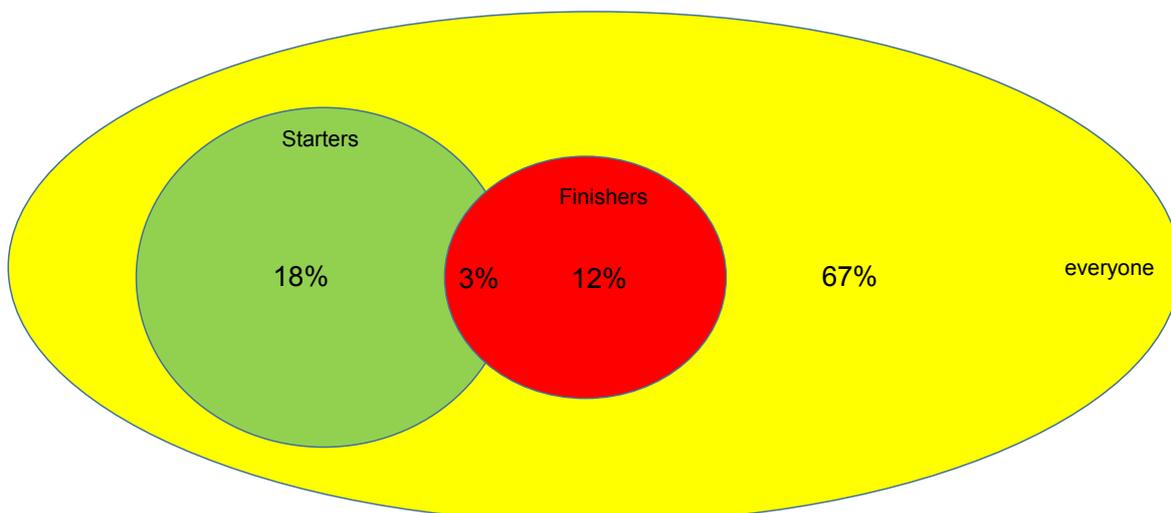
No surprise that this was an organisation with many, many 'live' innovation projects in their development pipeline, with barely a trickle of tangible output emerging from the end of the pipe. I suspect their Start/Finisher ratio is pretty typical.

How has this situation been allowed to arise? We can perhaps find an important clue if we try and find ourselves a course or an education programme that will teach us the skills of being a Finisher. I couldn't find any. Compare that with the billion-and-one courses, bootcamps, degrees and webinars being offered by the million-and-one creativity consultants. Even the most cursory glance at what the education world has to offer and the only conclusion a visitor from another planet could conclude is that this planet must be seriously lacking in creativity. And that we're all natural born Finishers.

Creativity is easy. Persistence, and blood-and-guts, getting stuck in is hard. And it's boring and tedious most of the time. Who'd volunteer to teach that? Or, worse, volunteer to join the programme?

Actually, we had one occasion with one of the more enlightened innovation-focused enterprises on the planet to design and run such a 'blood and guts' Persistence/Battle-Skills Bootcamp. We even had a few people sign up to join it. Those that did agreed it was hard work, and the walls were often covered in at least metaphorical blood and guts. Most even completed it (and have subsequently gone on to have flourishing careers by the way). But the company never got to run it a second time. 'People want stuff that is fun' the HR people told us. So much for that idea.

Everyone Inbetween?
The Starter/Finisher Venn diagram also suggests that the majority of people inside organisations see themselves as neither Starters nor Finishers. Over two-thirds in fact. What is it with them? And why are companies paying for them to be around?

No-one come to work to do a bad job. A rather large proportion, on the other hand, seem to be quite keen to come to work to do an easy job. Or more specifically, a job with minimal consequences. That's a big problem from an innovation project perspective since fundamentally any innovation project is about breaking rules and change, both of which always have consequences. Turning the handles and following procedures is as good as it gets when it comes to minimal consequences. That's what company's are paying people to do for the most part: turn handles with no consequences.

It gets worse too when we scrape below the surface of the 'Starters'. They're often the worst ''no consequence' culprits since merely having the idea has lots of upside and zero downside. At least in the short term. And by the time the long term arrives, hey, we'll have 'earned our keep' by generating a ton of new ideas by then.

Self-Declared-Versus-Actual
One of the great joys of the PanSensic tools is they allow us to get between the lines of what people are saying. If you read most people's LinkedIn profiles, for example, you'd conclude that we all created billion dollar brands by ourselves, singlehandedly dug the Channel Tunnel with our own shovel, and run a marathon a month for kicks. What people say about themselves and what's actually true are often two quite different things. Especially when it comes to describing the work we do. No-one (in their right mind) is going to go to a job interview – unless you're Kevin Spacey in classic movie, American Beauty – declaring they want a job with no consequences. Given the choice, we're all much more likely to declare ourselves Starters or Finishers than 'neither'. Even better to declare that we 'do both'. So what happens when we run the PanSensic Start/Finisher-Deulsion Effect tools over the self-declared Start/Finisher Venn diagram?

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This:
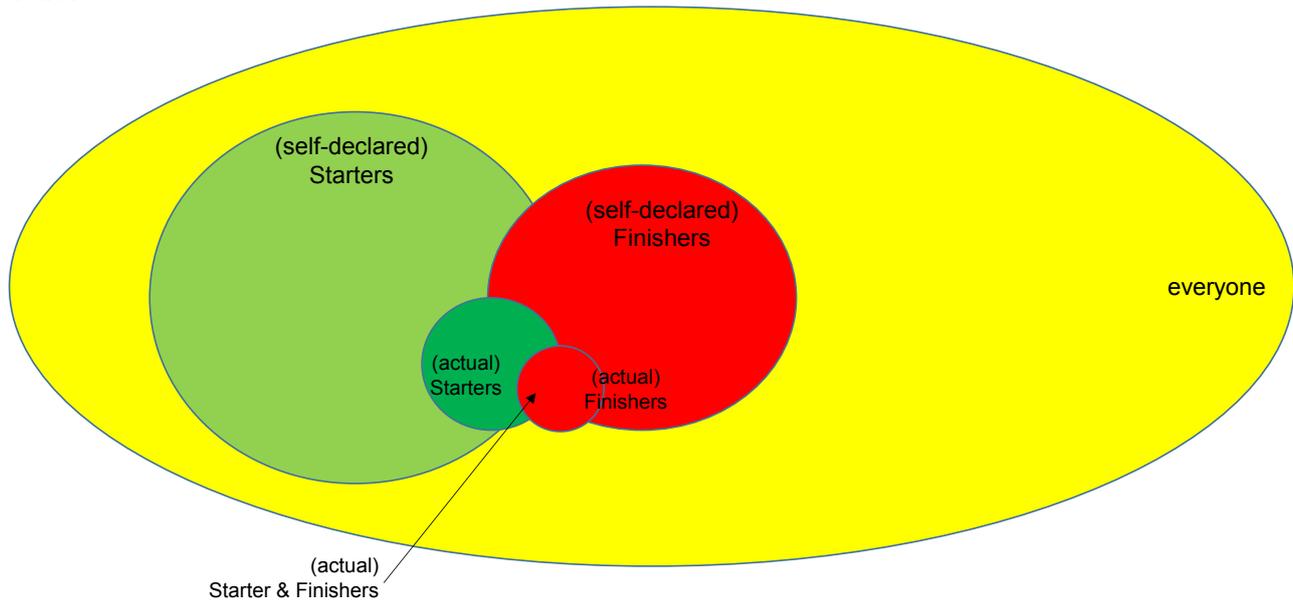
According to our (admittedly sparse so far) quantitative analyses with our clients, while the percentage of self-declared Starters is 18%, the percentage of people that actually Start things is closer to 4%.

Regarding the Finishers, perhaps more worryingly from an innovation capability perspective, the self-declared 12%, looks more like a smidgeon under 2% when looked at through the 'actual' lens.

The Starter/Finisher overlap area similarly drops from 3% when people tell you what they are to a barely measurable 1% when you scratch beneath the surface.

The only shred of good news in this analysis was a realization that there are a number of people inside organisations that believe themselves to be neither Starters nor Finishers that turn out to actually have the skills and wherewithal to competently fill one or both roles.

So What?
So here, finally, is the ultimate point of this rant: if innovation success is all about deploying the critical mass of resources at a critical point, the limiting factor in the vast majority of organisations I've ever seen is the number of actual 'Finishers' they possess. The number of these you have determines your critical mass, and that in turn determines the size and scope of the projects you have a chance of being successful with. Which has nothing at all to do with the market…

…and if that's of concern to you, and you're thinking to yourself, 'we really ought to be driven by the market', the simple response is that your real next challenge is to acquire or educate the requisite number of Finishers to serve that market need.

Case Studies:
I Want Redundancy And I Don't Want Redundancy

The Japanese quality revolution of the 1970s forced just about every enterprise on the planet along a road towards 'continuous improvement' and increased operational excellence. Where 'excellence' typically came to mean 'efficiency'. Which in turn meant stripping out waste. Which in turn has come to mean that everyone in the business needs to be efficiently occupied 100% of their time. Talk to managers at these efficiency sweat-shops about how employees at 3M get to spend 15% of their time on whatever they like, or how it's 30% at some Google facilities and they look at you as if you're from another world. 'How could you possibly survive if you're in effect building 15% or 30% waste into your organisation?' they will ask. While the figures and the stories might contain a fair degree of artistic license on the part of both 3M and Google, the basic point remains the same: both organisations need to build this kind of 'redundancy' into their operations in order to give them the best chance to survive and thrive beyond the near term future. 'Redundancy' in their world is insurance that there will be a future.

Clue to why 3M and Google comes when we look at the respective step-change 'pulse-rate' of their respective industries: both get to experience at least one significant jump per year, and as a consequence there is a high rate of product and service churn. By the time a product has been through even a part of its efficiency-improvement journey, it's probably been replaced by the next step change.

In high pulse-rate industries, building 'redundancy' into the operational business model is an essential survival factor. It is the brain and muscle there to allow the work out what's coming, and to run faster than their competitors to design and own the emerging market opportunity.

As ever, the redundancy question is not so much one of optimization ('what's the right level of redundancy for our business?') so much as a contradiction to be resolved. Figure 1 maps the high level version of the redundancy contradiction:
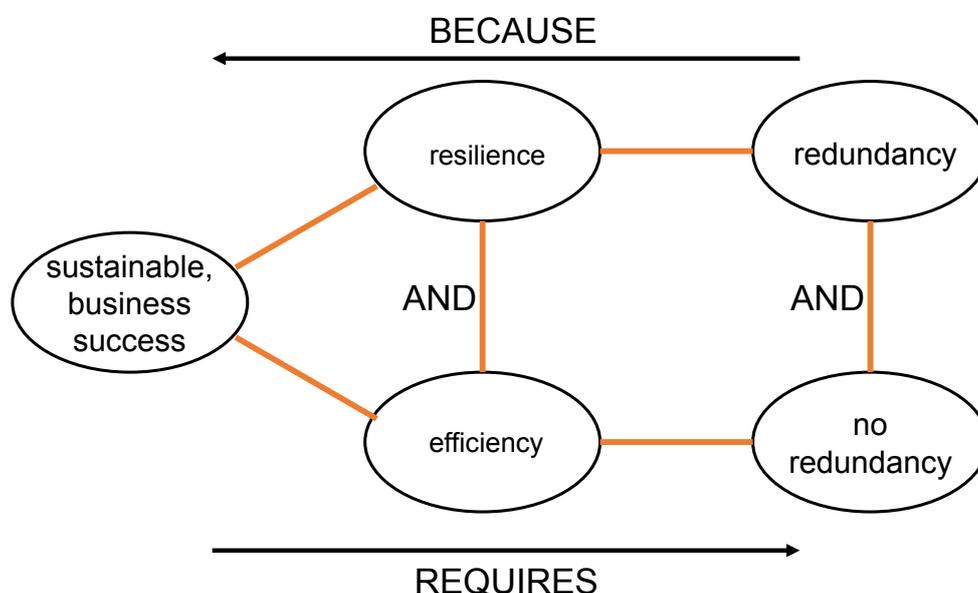

**Figure 1: The Redundancy/No-Redundancy Contradiction**

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Mapped on to the Matrix+ software wizard, Figure 2 shows the ranked sequence of Inventive Principles used by others to solve similar problems:

Most Likely	2nd	3rd	4th	5th	6th
35 - Parameter Changes	2 - Taking Out	12 - Equipotentiality	4 - Asymmetry	15 - Dynamics	10 - Preliminary Action

Figure 2: Ranked List Of Inventive Principles For The Redundancy Contradiction

We had the very fortunate experience to work with a large conglomerate client recently on their redundancy problem. Or, in their words, 'how do we best strip away the right amount of today's fat that will still leave us enough to survive future food shortages?'

The answer for them turned out to be fairly simple, and really came before we even opened the Matrix+ software. Requisite redundancy is a function of the market pulse rate. Their main challenge, being a conglomerate, was that they were in multiple different markets operating at quite different pulse cycle times.
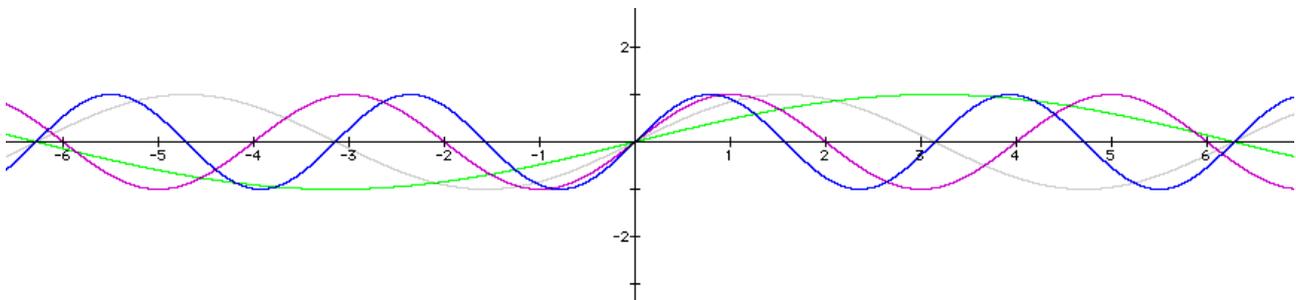
Principle 15, Dynamics, allowed us to refine the solution idea: 'allow the characteristics of a system or process change to allow re-optimisation under changing conditions'. Redundancy is not a fixed percentage – it depends on the pulse rate of each market segment separately, and it also depends on whereabouts on the market maturity s-curve each business is.

The idea was further refined by the not-so-promising-sounding Principle 2, 'Taking Out'. Or 'separation' in one of its more friendly forms. Taking-out implied removal of redundancy, but the team re-interpreted it as a need to separate out and set up a cross-domain innovation capability that could have a proportion of permanent members (people comfortable living in the 'Special World' of the innovation project) and a proportion of floating members that could connect new solutions back to the Efficiency Engines in their business unit. Something like a Skunkworks where as many of the domain specialism silos as possible were removed so that it became more likely that 'the right' solution could be evolved rather than the one dictated by the domain specialist that shouted loudest as is often the case in other industries. Significantly, too, I also liked their (Principle 35) idea of making a conscious shift in innovation thinking away from 'technology' towards the low-hanging fruit they could see in the business-innovation world. Given that there was in effect no formal 'business innovation' capability inside the organisation, this was seen as an area where there were already no silo walls.

So much for a multi-national conglomerate's redundancy contradiction. What about small organisations, where there is only one business unit and no possibility of synergy with other businesses operating on different pulse rates?

The problem is the same, but how could the solution also be the same? Sometimes a small company needs more redundancy than others. So how could it help to manage the fluctuation? Maybe by identifying the equivalent of the 'other, different pulse-rate businesses' that were readily found inside the conglomerate? Radical as it might sound, this is precisely what a cluster of small businesses have done on a regional basis in Bavaria, Germany. They've recognized – in line with the first article in this issue of the ezine – that a large part of resilience is doing the creative work to see what's coming along the road, and generating the ideas that make sure they have a plan to cope and, better, thrive when whatever is coming actually arrives. So companies take turns to host problem solving sessions. When its one company's turn to host, everyone comes and works on problems for that company. Then, next week, we all go to the next company and collectively work on *their* problems. This is all about taking organizational resilience to the meta level. With this cluster of company's there's a very elegant recognition that the success of the region comes from the collective success and collective survival of not just one company, but of all of them. Almost like an eco-system packed full of symbiotic organisms. Which, come to think of it, might just be the secret to Silicon Valley's sustained success: individual efficiency through collective resilience.

Fairly Funny – London Underground

Now I live in rural Devon, travelling on the London Underground at rush hour has become my definition of Hell on Earth. Fortunately, someone has thought of a good way to alleviate at least some of the trauma:

I quite like some of the new 'honesty is the best policy' information signs:

These are pretty good too:

I think these are my favourites:

Although, when things get three-dimensional, I think we enter the world of borderline genius:

**Patent of the Month – Ceramic Shape Memory Alloy**

Our patent of the month this month goes, not unusually, to inventors at MIT. US9,018,117 was granted to a pair of inventors at the Institute on 28 April. The subject probably helped: we love shape memory alloys, and it's not often we get to see a major step change forward in the state of the art in the domain these days. This invention looks like it offers one of those elusive great leaps forward. Here's what the inventors have to say about the challenge they've had to overcome:

Shape memory materials are characterized as those materials that can undergo reversible transformation between two distinct morphological phases, namely, a martensitic phase and an austenitic phase. Such transformation can in general be induced by exposure to an external stimulus such as, e.g., a change in temperature or applied mechanical stress, or a change in applied magnetic or electrical field. In general, shape memory materials dissipate energy during transformation between martensitic and austenitic phases. This energy dissipation is due, in general, to the creation and motion of internal material interfaces during the phase transformations, and the amount of energy that is dissipated is directly related to the transformation stress and strain.

The most widely employed shape memory materials are metals, and in particular metal alloys. Shape memory alloys (SMAs) are well-known for their ability to transform between martensitic and austenitic phases. But conventional SMA structures are characterized by relatively low transformation stresses and correspondingly low energy dissipation capabilities. In contrast, some ceramic materials have been shown to be capable of exhibiting reversible martensitic transformation with high stresses, offering the prospect of improved energy dissipation over that of conventional SMAs and the ability to particularly address applications in, e.g., actuation, energy harvesting, and mechanical energy damping.

But it is found that in general, because the martensitic transformation and its associated shape change generally leads to substantial internal stresses, ceramics, which are in general brittle materials, have a tendency to crack during such transformation. As a result, ceramics can in general exhibit only very small shape memory strains and commensurately low energy dissipation levels, and tend to fracture or crack during such processes. Thus, although ceramic materials could in, principle exhibit shape memory and superelastic properties with useful transformation shape recovery, such is not achievable due to the inherent brittle nature of such ceramic materials.

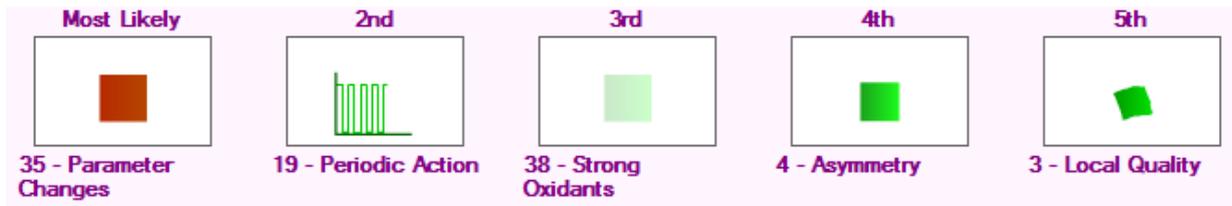Which maps to something like this on one of our Contradiction Mapping templates:
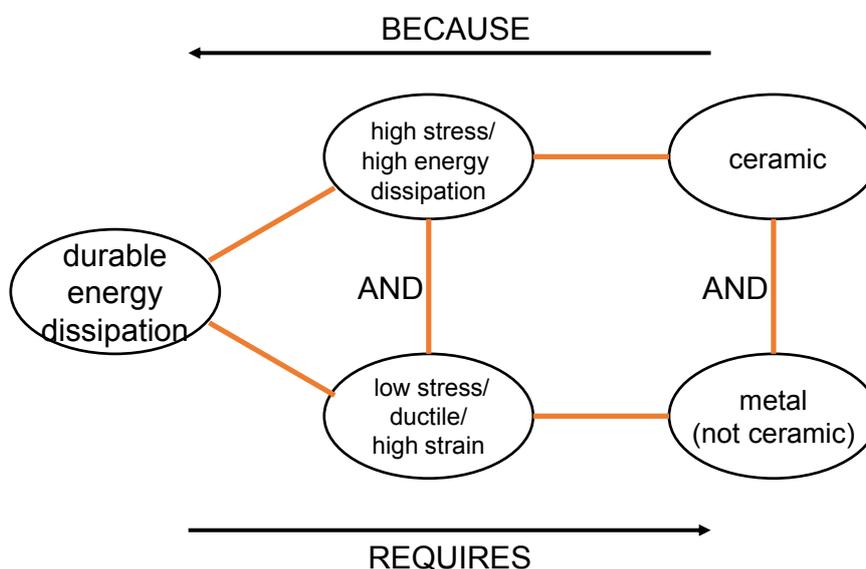
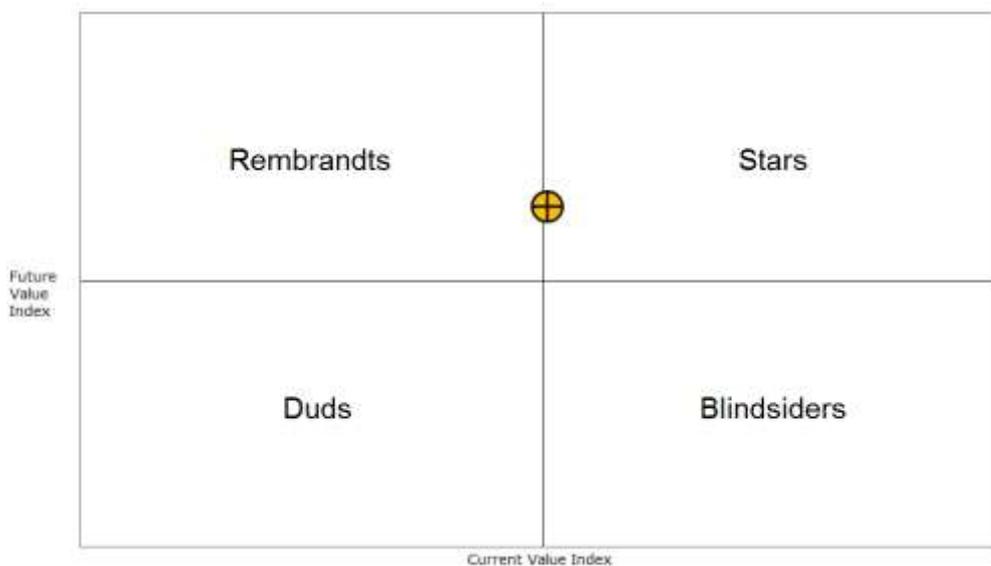And here's how the 'inherent' problem has now been overcome:

A mechanical structure comprising: a crystalline ceramic material that transforms between an austenitic phase and a martensitic phase by an applied stimulus, the martensitic phase including martensitic domains, each martensitic domain having a domain length; and wherein the ceramic material is configured as a ceramic material structure having a ceramic material feature extent that is smaller than the martensitic domain length of the martensitic phase ceramic material.

Which makes for a rather excellent example of a Principle 35, Parameter Change. Many people still think of this Principle as an optimization tool, but per our previous suggestions, what it's really about is 'changing a parameter…' – in this case a length – '…to such an extent that a step change occurs.' Which is precisely what's happened here.

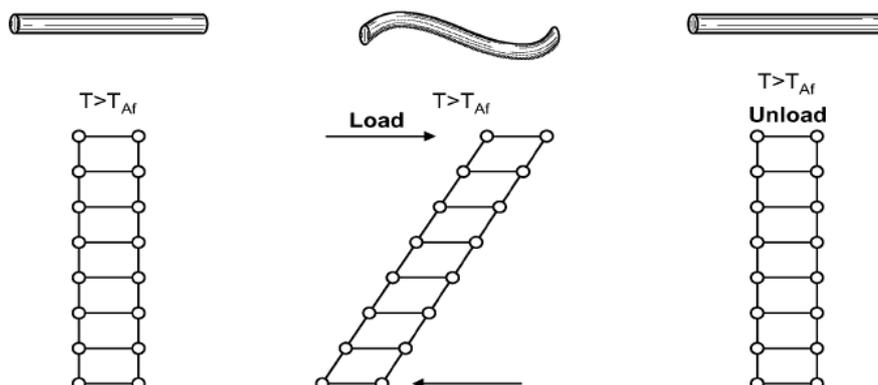Here's what the Contradiction Matrix has to say on the solution strategy:

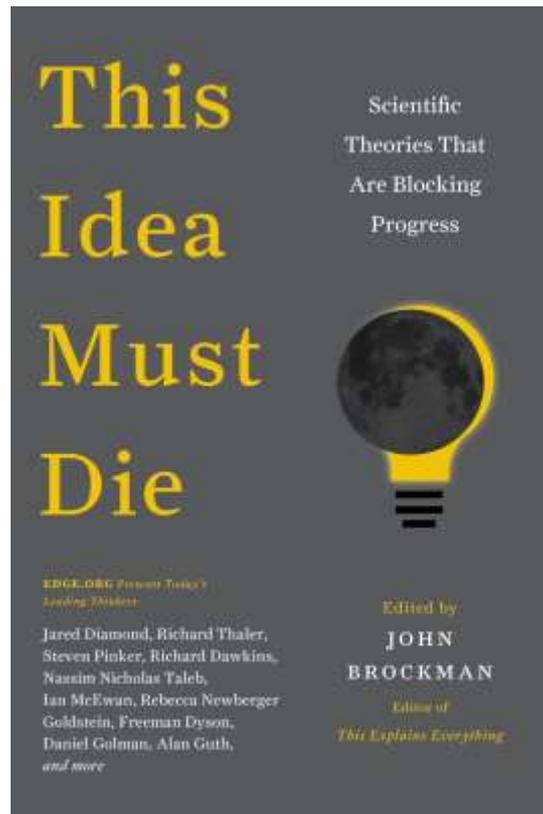| Most Likely	2nd	3rd	4th	5th
35 - Parameter Changes	19 - Periodic Action	38 - Strong Oxidants	4 - Asymmetry	3 - Local Quality

And ApolloSigma:

All in all, we think it's a Level 4 invention. Fingers-crossed it has the opportunity to turn into a Level 4 innovation in the coming months and years.

Best of the Month – This Idea Must Die

We love contradictions. We love it even better when really smart people help us to see contradictions that we perhaps hadn't recognised ourselves. And that's precisely what the bestselling editor of *This Explains Everything has done,* bringing together 175 of the world's most brilliant minds to tackle Edge.org's 2014 question: What scientific idea has become a relic blocking human progress?

Each year, John Brockman, publisher of Edge.org—"The world's smartest website" (*The Guardian*)—challenges some of the world's greatest scientists, artists, and philosophers to answer a provocative question crucial to our time. In 2014 he asked 175 brilliant minds to ponder: What scientific idea needs to be put aside in order to make room for new ideas to advance? The answers are as surprising as they are illuminating. Some of the highlights include:

- Steven Pinker dismantling the working theory of human behavior

- Richard Dawkins renouncing essentialism

- Sherry Turkle reevaluating our expectations of artificial intelligence

- Geoffrey West challenging the concept of a "Theory of Everything"

- Andrei Linde suggesting that our universe and its laws may not be as unique as we think

- Martin Rees explaining why scientific understanding is a limitless goal

- Nina Jablonski arguing to rid ourselves of the concept of race

- Alan Guth rethinking the origins of the universe

- Hans Ulrich Obrist warning against glorifying unlimited economic growth

In turns infuriating (I wish this writer actually understood contradictions) and inspiring, this is one of those rare things these days, a book that is both crammed full of actual content and at the same time highly readable. It was recommended to me just before I got on a twelve hour flight. Under normal circumstances I would've tried to sleep as much of that twelve hours as possible. As it turns out, I spent most of them reading This Idea Must Die. In theory, I should've been tired when we landed. In reality, I was buzzing with a host of new 'good problems' to work on. Happy, happy, happy.

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Wow In Music – Should I Stay Or Should I Go?
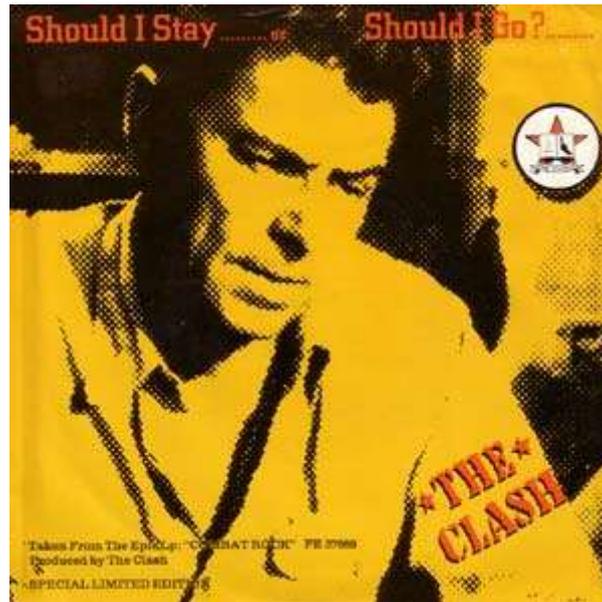
Another multi-level musical wow this month, the Clash's 80s hit 'Should I Stay or Should I Go'. If 'wow' turns out to be all to do with contradiction emergence and resolution, then we see our first contradiction in the title before we hear a note.

The story deepens when we learn that, in 1982 when the song was recorded, tensions were high within the ranks of The Clash, one of the most influential rock bands of all-time, as the founding members were breaking up before our eyes. As The Clash was recording the album Combat Rock, drummer Topper Headon was struggling with heroin addiction, which was affecting his health and his performance as a musician. Joe Strummer and Mick Jones were getting on each other's nerves. It's been said that the song "Should I Stay Or Should I Go" was the last straw. The line "if you want me off your back" was originally "on your front or round the back". Whatever the reason for the change caused a huge fight between Strummer and Jones.

At about the two-minute mark of the song, Mick Jones can be heard yelling the word "split". According to legend, Joe Strummer snuck into the vocal booth and scared the daylights out of Jones. Jones angry reaction and demand that Strummer get lost was recorded as tape continued to roll.

Zooming in to listen to the song itself, one of it's most unusual effects starts in the second verse when Joe Strummer begins a very unusual technique of echoing the English lyrics in Spanish. Singing the Spanish parts with Joe Strummer was Joe Ely, a Texas singer whose 1978 album Honky Tonk Masquerade got the attention of The Clash when they heard it in England. When Ely and his band performed in London, The Clash went to a show and took them around town after the performance. They became good friends, and when The Clash came to Texas in 1979, they played some shows together. They stayed in touch, and when The Clash returned to America in 1982, they played more shows together and Ely joined them in the studio when they were recording Combat Rock at Electric Ladyland Studio in New York. In a 2012 interview with Joe Ely, he explained: "I'm singing all the Spanish verses on that, and I even helped translate them. I translated them into Tex-Mex and Strummer kind of knew Castilian Spanish, because he grew up in Spain in his early life. And a Puerto Rican engineer (Eddie Garcia) kind of added a little flavor to

it. So it's taking the verse and then repeating it in Spanish."

When asked, Ely whose idea the Spanish part was, he said, "I came in to the studio while they were working out the parts. They'd been working on the song for a few hours already, they had it sketched out pretty good. But I think it was Strummer's idea, because he just immediately, when it came to that part, he immediately went, 'You know Spanish, help me translate these things.' My Spanish was pretty much Tex-Mex, so it was not an accurate translation. But I guess it was meant to be sort of whimsical, because we didn't really translate verbatim."

According to Strummer, Eddie Garcia, the sound engineer, called his mother in Brooklyn Heights and got her to translate some of the lyrics over the phone. Eddie's mother is Ecuadorian, so Joe Strummer and Joe Ely ended up singing in Ecuadorian Spanish.

This indecision's buggin' me (Indecisión me molesta)
If you don't want me, set me free (Si no me quieres, librame)
Exactly whom I'm supposed to be (Dime! ¿Qué tengo ser?)
Don't you know which clothes even fit me? (¿Sabes que ropa me quedar?)
Come on and let me know (Pero tienes que decir)
Should I cool it or should I blow? (¿Me debo ir o quedarme?)

Split

(Doble! ¿Me frío o lo soplo?)
(Esperda)
(Rrattarrattarrattaa...)

Should I stay or should I go now? (Yo! ¿Me frío o lo soplo?)
Should I stay or should I go now? (Yo! ¿Me frío o lo soplo?)
If I go there will be trouble (Si me voy, va a haber peligro)
And if I stay it will be double (Si me quedo, es doble)
So you gotta let me know (Pero que tienes que decir)
Should I cool it or should I blow? (¿Me frío o lo soplo?)
Should I stay or should I go now? (¿Me frío o lo soplo?)
If I go there will be trouble (Si me voy, va a haber peligro)
And if I stay there will be double (Si me quedo, es doble)
So you gotta let me know (Pero que tienes que decir)
Should I stay or should I go

This English/Spanish doubling could be thought of as a simple illustration of Principle 5, Merging. The fact that Strummer manages to make the different syntax found in the Spanish scan so invisibly with the English lyric being sung by Jones is probably closer to either alchemy or Inventive Principle 37.
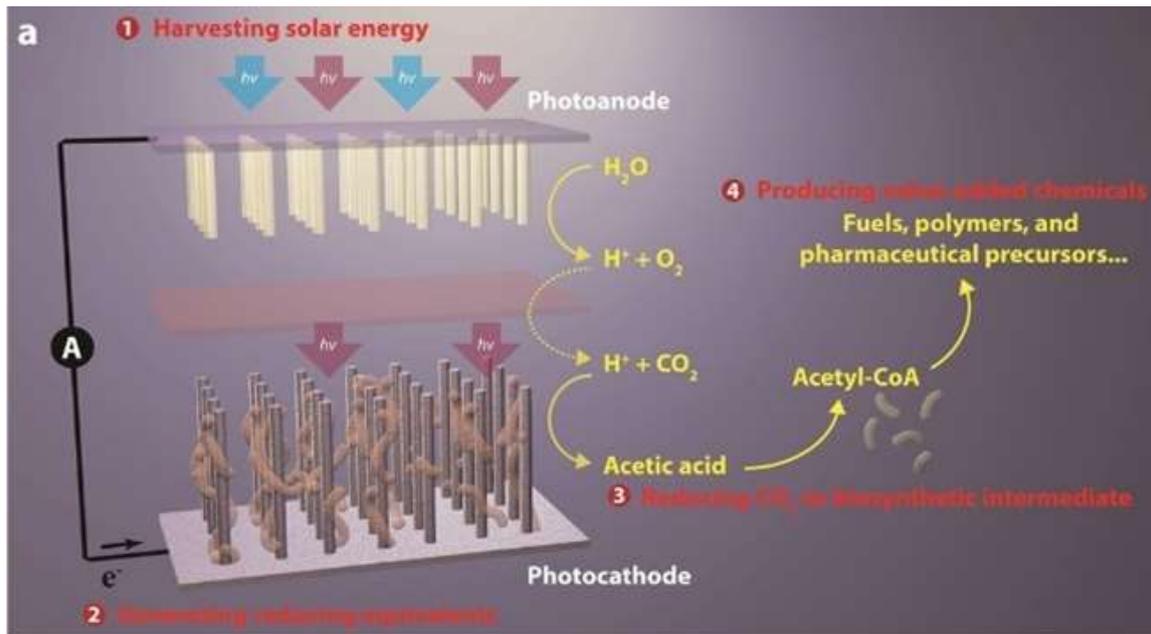
Finally, the thing that makes the song so instantly recognizable is the main guitar riff. In theory very easy to play, the trick – and the thing that makes the song so hypnotic – are the micro-tension-building variable (Principle 19B) gaps and pauses. Pauses that get even more exaggerated just after Jones shouts his 'split' at the two minute mark, as the song goes into its middle eight. Should I Stay Or Should I Go ultimately succeeds on its use of tension-building-tension-releasing tempo changes. Or, to quote Duke Ellington, 'it don't mean a thing if it ain't got that swing'.

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Investments – Artificial Photosynthesis

One of April's most viral scientific stories:

"Researchers at the Lawrence Berkeley National Laboratory and the University of California at Berkeley are claiming a major advance in artificial biosynthesis after developing a system which can capture carbon dioxide and, using sunlight, convert it into biodegradable polymers, pharmaceutical ingredients or liquid fuels. The system combines the use of semiconductor nanowires and bacteria in a hybrid network, as the team describes in the journal Nano Letters.

"The system consists of an 'artificial forest' of nanowires made out of silicon and titanium oxides, which lead researcher Peidong Yang says are analoguous to the chloroplasts in green plants — the chlorophyll-containing cells where photosynthesis takes place. When sunlight hits these structures, electrons are freed from the titanium and silicon atoms, which absorb different light wavelengths, and are passed on to Sporomusa ovata bacteria which are nestled within the nanowires "like Easter eggs buried in tall grass," as co-author Michelle Yang describes it; these bacteria then reduce the carbon dioxide, transforming the usually very stable carbon atom into a more reactive form. Meanwhile, the positively-charged 'holes' left by the electrons force water molecules in the air to split apart, generating reactive oxygen that reacts with the reduced CO_2 to form acetate, a useful building-block for other organic molecules.

"The acetate is then fed to genetically-engineered E coli bacteria which stynthesises it into a variety of product molecules. In the team's experiment, the two bacterial populations were kept separate but they could be combined, the researchers say.

"Sporomusa ovata was chosen because it readily accepts electrons from its environment. It is usually oxygen-sensitive, but the protective effect of the surrounding nanowires have a protective effect. "We were able to uniformly populate our nanowire array with S. ovata using buffered brackish water with trace vitamins as the only organic component," said Chang.

"Separating the light capture and solar conversion and the catalytic activity boosts the efficiency of the process, which the team claims was around 0.38 per cent: about the same as a leaf. They claim yields of about 26 per cent for the liquid fuel butanol; 25 per cent for the antimalarial drug precursor amorphadiene; and 52 per cent for the biodegradable plastic PHB. "We are currently working on our second generation system which has a solar-to-chemical conversion efficiency of three per cent," Yang says. "Once we can reach a conversion efficiency of 10 per cent in a cost effective manner, the technology should be commercially viable.""

So far, based on this last comment from Professor Yang (check out his website: http://nanowires.berkeley.edu/) reveals a significant discovery, a rather good patent application (US20130105305) and the ears of the media. Whether or not it is investable yet is debatable. It's an invention but it's not an innovation. If it were me, I'd let the research team crack on with increasing the efficiency, but I'd be putting my innovation efforts into, a) cheapest-manufacture technology, and, more importantly, b) an early-adopter, high-value market niche that would benefit from a 'minimum viable' version of the invention. The clue comes from the earlier comment that the current solution already has the same efficiency as nature. Nature tends to be a pretty good teacher on this front: you don't need massive performance efficiency if you can produce economically.
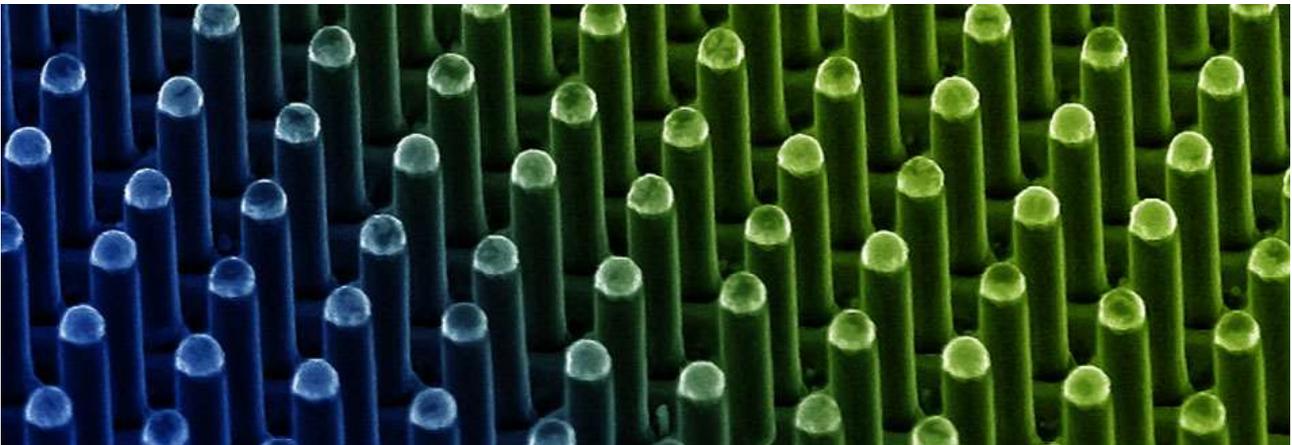
Generational Cycles – Top Hat

Weird things that aren't so weird. Why has the stage musical version of the 1935 Fred Astaire & Ginger Rogers movie, Top Hat been such a phenomenal success in the UK since its launch in 2011?

The show had its world premiere on 16 August 2011 at the Milton Keynes Theatre, at the beginning of a 17-week UK tour stopping in Birmingham, Southampton, Salford, Plymouth, Norwich, Canterbury, Edinburgh and Leeds. An additional pre-West-End tour took place in spring 2012, at the New Victoria Theatre in Woking and the Bristol Hippodrome from 21–31 March.

The production then moved to the West End's Aldwych Theatre on 19 April 2012, with its opening night on 9 May and an initial booking until the end of January 2013, which was extended, with a new cast, until October 2013. After which a further 47-week tour of the United Kingdom and Ireland commenced at the New Wimbledon Theatre, on 12 August 2014, and has thus far filled houses in Wimbledon, Milton Keynes, Newcastle, Aberdeen, Edinburgh (again), Wolverhampton, Nottingham, Bristol (again), Glasgow, Leeds, Cardiff, Oxford, Manchester, Sheffield, Birmingham (again), Norwich, Canterbury, Plymouth (again), Southampton (again), Dublin, Belfast, Sunderland, Woking (again) and Eastbourne.

Perhaps here is a good reason for the show's success:
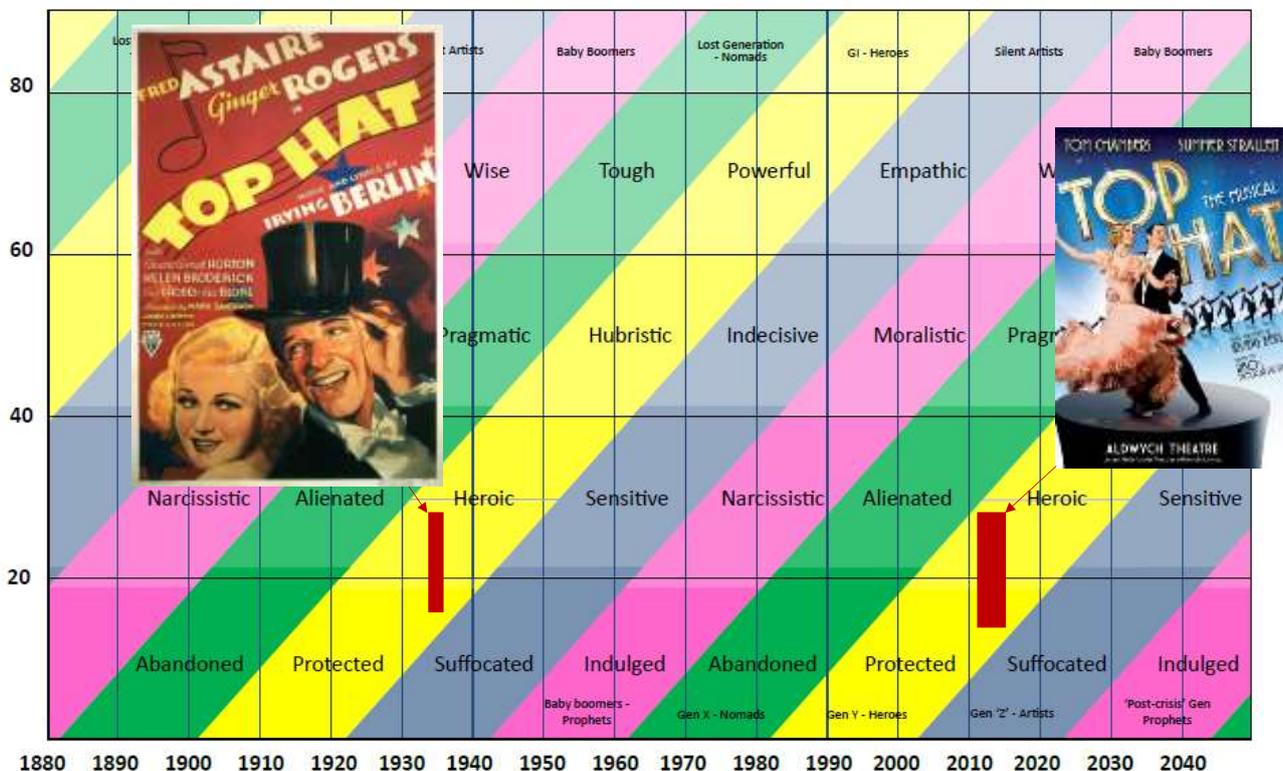
Top Hat's are for Heroes. Perhaps, tellingly (?), the critical reviews – by Nomad reporters - of both the film and the stage production have been 'mixed' at best. 'Thin plot', 'weak script', 'paper-thin characters' all turning out to be largely irrelevant in terms of box office figures. The Hero audience, it seems, just wants to see good choreography, tuxedos and sparkly dresses.

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Biology – Panic Grass

The plant, a type of grass known as Panic Grass *(Dichanthelium lanuginosum)*, can grow at temperatures of up to 65C. Not bad when you consider the lethal temperature for humans is about 40C. It is found growing in Yellowstone National Park in the hot soils surrounding the geysers and the "Artists' Paintpots". But only when it has a fungal symbiont *Curvularia protuberata* and this in turn is 'infected' with *Curvularia* thermal tolerance virus (CThTV).

The ecological love-triangle was shown to be necessary for the plant-partner's survival. This was done by infecting the plant with a 'cured' fungus (one that lacks the virus) and comparing it to a plant with both fungus and virus and a plant with no symbionts. The plants were then treated to growing conditions of 65C for 10hrs and 37C for 14hrs. At the end of the treatment, only plants with both partners remained healthy. Furthermore, all plants with both symbionts remained alive whereas the majority of the plants with only the fungus or nothing at all died before the experiment was completed.

It makes for a terrific example of a Principle 5, Merging (symbiosis) solution, albeit one that probably counts more as a Principle 40, Composite, given the need for three co-existing components rather than the more usual symbiosis between two.

Here's what the Contradiction Matrix has to say regarding the problem that the Panic Grass has had to overcome:

> IMPROVING PARAMETERS YOU HAVE SELECTED:
>
> Adaptability/Versatility (32) and Safety/Vulnerability (38)
>
> WORSENING PARAMETERS YOU HAVE SELECTED:
>
> Temperature (22)
>
> SUGGESTED INVENTIVE PRINCIPLES:
>
> 35, 36, 19, 3, 2, 31, 5, 24, 15, 13, 4

Perhaps it's also worth noting the fact that one of the three symbionts is a virus. Viruses are normally seen as 'bad', in which case we might think of the vital presence of

Curvularia as an example of Principle 22, Blessing In Disguise? Not common enough as a solution strategy in human contradiction-solving to feature in the Matrix, but something that the plant-world seems to have used quite a lot, viruses providing a variety of services for plants. Investigators have also found that certain viruses can render some plants drought tolerant, and at least one example of virally-conferred cold tolerance has been discovered-- discoveries that could become useful for expanding the ranges of crops.

Plants are often infected with "persistent viruses" that are passed down from generation to generation, perhaps over thousands of years, with viruses that are transmitted to nearly 100 percent of their plant progeny, but that have never been shown to be transmitted from one plant to another. "One such virus, white clover crytpic virus, suppresses formation of nitrogen-fixing nodules when adequate nitrogen is present in the soil, saving the plant from producing a costly organ when it is not needed" said Professor Marilyn Roossinck, a leading researcher in the 'good-virus' domain.

Other beneficial viruses are the ancient retroviruses that long ago made a permanent home in the genome, or that left genes therein, said Roossinck. "The mammalian genes for syncitin, essential in the establishment of the placenta, are retroviral env genes that were incorporated on several different occasions," Roossinck writes. "They even function differently in ruminants compared to other mammals... these elements are considered viral fossils that can help us understand the deep evolution of viruses."

"Viruses are beyond a doubt the coolest things I have ever encountered," said Roossinck. "They do truly amazing things with very little genetic information. I was always a little disturbed at the bad rap they get, so it was very exciting for me to find good ones."

Hmm. Perhaps something to also think about in the context of ICMM Level 1 organisations?

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Short Thort

Trendstorming

Trend	Clue	Because…	But…
Space Segmentation	(crude, raw solution idea)	(advantage conferred by the jump)	problems arising
Surface Segmentation			
etc		(advantage conferred by the jump)	

The problems arising as a result of one trend-jump solution clue
will be solved by the benefit conferred by one of the other trend-jump solution clues…

…that's why it's really important to write down 'solution clue' ideas
irrespective of whether they sound good, bad or ridiculous….

…the Trends are all signposts to success.
sometimes, you need to get instructions from several signs
before you know where you're heading.

News

Hong Kong
Following a successful second trip of 2015 to Hong Kong this month, we're happy to announce that we will be returning for more public workshops and client projects during the second half of July and second half of August. Most of the days are already allocated, but there are one or two spares if anyone is interested in making use of them.

Systematic (Software) Innovation – Chinese Edition
April saw us signing agreement with one of the biggest publishing houses in China to translate and publish a Chinese edition of the Systematic (Software) Innovation book. With a following wind, the book is expected to be available from the third quarter of 2015.

Engineers Ireland
We are happy to announce that Darrell will be keynoting at the Engineers Ireland Best Practice Roadshow in Limerick on 12 June. The theme of the day is 'Innovation Blueprints: Building Sustainable Innovation Cultures'. More details from the Engineers Ireland website: http://www.engineersireland.ie/Events.aspx

New Projects

This month's new projects from around the Network:

Government – PanSensic study
Utility – Design/Make project
Automotive – IP strategy study
Automotive – 'TRIZ For Systems Engineers' workshop series
Semiconductor – Problem-Solving workshops
Conglomerate – Innovation Strategy workshop sessions
Telecom – Consumer Insight study
Transport – TrenDNA consumer insight workshop
Medical Devices – ICMM Assessment
Medical Devices – Trendstorming workshop
Government – IP Support Programme for SMEs
Education – Strategy Definition workshops
Aerospace – SI Certification workshops

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