Systematic Innovation

e-zine

Issue 265 April 2024

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**

Strategy As A System Redux

If you can believe it, we first wrote about 'strategy as a system' back in 2011 (Reference 1). It was probably notable for two things: one, it was one of the first times we expanded the TRIZ Law of System Completeness (LoSC) to include a sixth element, and, two, it was in effect an homage to our favourite strategy book of the day, 'Good Strategy/Bad Strategy' by Richard Rumelt (Reference 2). He in turn was one of the first authors to recognise that the process of designing and managing strategy required 'a system'. Figure 1 reproduces our translation of Rumelt's system elements into the context of the LoSC:

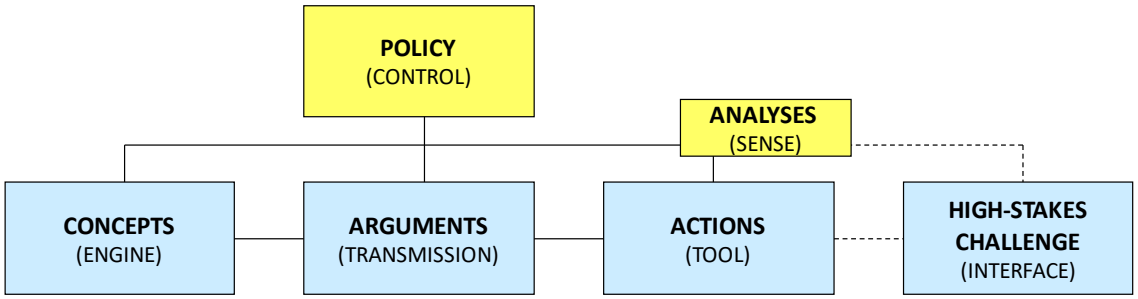

Figure 1: 2011 Version Of LoSC-Based Strategy System

Not only does the model still make sense, over twelve years later, but the Rumelt book is still likely the best business strategy book on the market. At least until, we humbly suggest, our new FutureProof book hits the shelves. Our work gets to take advantage of the myriad strategy-related battle-scars we've accumulated with brave clients over the course of the last decade and the many thousands of strategy books that have appeared (and usually disappeared) since 2011. Rumelt, for example, was able to talk generically about 'concepts', 'arguments and 'high-stakes challenges', now we have a much better idea of what they mean specifically. This article, then, offers up an expanded version of what we wrote in 2011. And also an expansion of the recent DangerMouth strategy podcast discussion (Reference 3).

One of the perhaps controversial messages from the podcast was that, with what we now know today, there aren't any strategy books – including Rumelt's classic – capable of providing business leaders with anything like a complete strategy capability. A small number offer necessary components, but none is sufficient. In that none features all six of what we now know about the six essential elements. This article describes the six, but first, Figure 2 updates the 2011 LoSC model to show how they all ultimately fit together:

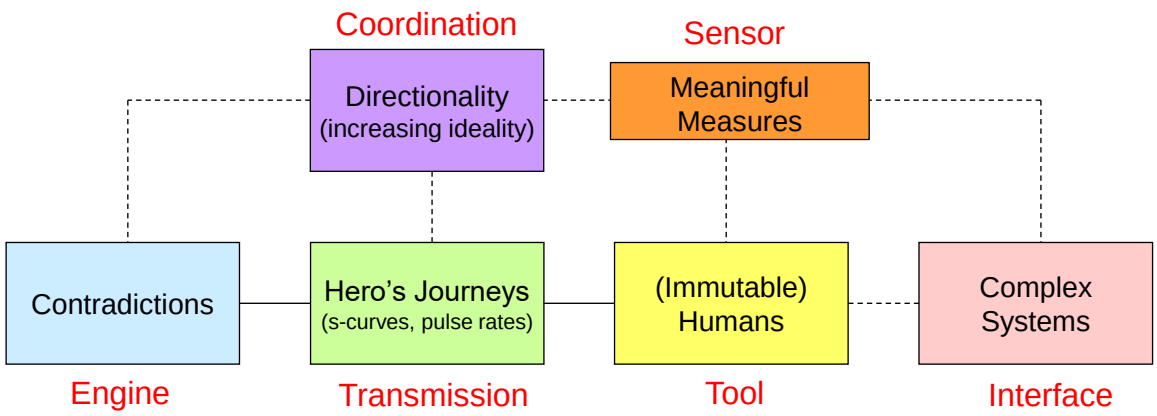

Figure 2: Current Version of LoSC-Based Strategy System

Let's start our tour of all six with the element that is best covered by existing management texts…

Interface – Complex Systems

Strategy is difficult. It is really difficult. Because, if the humans on the inside of an enterprise are (anthro-)complex, it is but nothing compared to the levels of complexity to be found in the world outside. Most markets are highly turbulent, the societies and cultures within which they operate are interdependent and, particularly at the present time, often tipping into seemingly uncontrollable chaos. There have been many business authors who, on recognising the VUCA nature of the world, have concluded that the only sensible way for organisations to navigate their way is to become extremely agile and adaptive. The future is essentially unpredictable, these authors claim, and therefore, the best and only way to ensure survival to be more adaptive than competitors. Which in turn means an existence of constant experimentation, probing the market, observing what happens, and course-correcting as necessary. Not surprisingly, the domain best equipped to talk about this need for extreme vigilance and thinking on one's feet come from the military, who, especially since encountering highly agile, loosely-connected terrorist threats, have had to undergo an enormous transformation away from their traditionally hierarchical pasts. And so we have people like Colonel John Boyd (OODA), Jocko Willink (Reference 4) and General Stanley McChrystal (Reference 5) showing business leaders a way forward. Hierarchy is bad; 'Commander's Intent' is good; empowerment is good; accountability is good; experimentation is good; the most adaptable wins. Anything can happen, make sure you're more ready than opponents. So far so good. Apart from the minor detail that the resulting agility turns enterprises into very reactive entities increasingly prone to a Brownian Motion-like random trajectory. The literal equivalent of, 'if you don't know where you're going, any road will take you there', only faster. What's largely missing from this worldview is directionality…

Coordination - Directionality

…in theory, 'Commander's Intent' is the thing that sets the direction of the enterprise. In practice, while the Commander may have a clear idea where they want the enterprise to head ('become number one in the market', 'buy an AI business', etc), it is far from clear that such ambitions have anything in common with what TRIZ tells us is the universally clear direction of success: increasing Ideality. What the original TRIZ researchers accidentally learned about the fundamental drive towards increasing customer benefits, decreasing cost and decreasing 'harm' happened by studying the world of technology, and specifically patents. They didn't apply the thinking to the world of business, but now we have, we can clearly see that successful enterprises are the ones pointing clearly in the direction of an 'Ideal Final Result' North Star. As yet, the only author anywhere close is Nassim Taleb, who's book, AntiFragile (Reference 6) at least points the strategic-way by defining a desirable destination for those *inside* an organisation to be aiming for. Taleb, like every other author, then, still haven't any comprehension of the increasing ideality concept, and therefore, there are no books for business leaders to go to learn about it. Ideal Final Result as a long term – again, universal – destination remains as an occasional thought in the eyes of a very small, cult-like group of TRIZ followers. And, most likely, many of them also doubt whether it is real or not. Particularly when we see so many things around us that are very clearly not heading in that direction. The problem here is that the noise of near-term turbulence can easily drown out the signal of longer-term directionality. The resulting irony being that, from a TRIZ perspective, the long-term future is much easier to predict than the immediate future. The near-term turbulence requires the sort of agility that comes through understanding complex systems (the system 'Interface'). Agility

is necessary but insufficient. It needs to be informed by the universal compass-heading. And, next up, a recognition that the journey is one for Hero's…

Transmission – Hero's Journey

…also found at the heart of TRIZ is a clear understanding of discontinuous change and the universal applicability of S-Curves. In theory, 'every' leader these days says that the understand s-curves. In practice they very clear do not. At least not in the way that the TRIZ research has uncovered. Or in the way Joseph Campbell discovered during his life-long study of the world's best literature. Humans are, first and foremost, storytellers. Homo narrans. We learn through story. And the best stories take the main protagonists through a discontinuous shift from one Ordinary World to the next. Campbell's main book on the Hero's Journey (Reference 7) is rarely read by business leaders, but it is probably the place to start in terms of beginning to understand what s-curves, and particularly the process of jumping from one to the next, are really about. Possibly closely followed, strategy-wise, by books about story-telling. Annette Simmons, 'Whoever Tells The Best Story Wins' (Reference 8) or Mike Adams, 'Seven Stories…' (Reference 9) would be good next-stops on the Transmission part of the strategy journey. Beyond that, the only two more traditionally 'business' books that have anything of real value to add to the strategy story, according to our research, are Geoffrey Moore's 'Zone To Win' (which offers up a useful but perhaps too-specific s-curve transition management strategy) (Reference 10), or 'Jumping The S-Curve' (which understands macro-level s-curves, but not so much a reality consisting of multiple layers of s-curves) (Reference 11). All of these recommendations, Campbell aside, also fail to understand the significance of the next essential element in any strategy story…

Engine – Contradiction Solving

…storytellers recognise the main lesson from a good novel or movie involves an 'Ordeal' the Hero has to overcome in order to successfully make the leap from one s-curve to the next. In TRIZ terms, this Ordeal is 'the contradiction, and the basis of successful change (and therefore strategy) is the successive identification and resolution of what will turn out to be a constant stream of contradictions. While several non-TRIZ authors – References 12 and 13 for example – have understood the idea of 'managing' contradictions, the global education system in effect teaches everyone that the only way to deal with contradictions is to make trade-offs and compromises. The TRIZ research could essentially be thought of as a mass reverse-engineering of all the problem solvers that refused to accept the compromises and sought instead to create a 'win-win', best-of-both-worlds solution. TRIZ is *the* place for contradiction solving. No other strategic thinking comes close. The irony here is that we often hear leaders talking about their desire for 'win-win' outcomes – they can, in other words, intellectualise that ambition – but to all intents and purposes from a non-TRIZ perspective the strategic importance of contradictions remains hidden in plain sight. Given that contradiction is the 'Engine' that makes strategy move, this is something of a problem for the vast majority of strategists.

Sensor – Meaningful Measurement

Systems need feedback loops, and feedback loops need to contain meaningful data. Most strategy initiatives seem to operate open-loop, which in effect means that leadership teams are flying blind when it comes to understanding the impact of the change actions they make. Other teams end up worse off than this because they're fooled into measuring what's expedient by the 'data analyst' community. In fairness to both parties, neither tends to have an understanding of the other, but one or both fail to communicate effectively, the most likely end result is that the pretty-looking dashboards of expedient data ensure that leaders are managing using the wrong data. In some cases – i.e. nearly all lagging

indicators – the data is going to result in leaders pointing the ship in the direction of Unintended Consequences icebergs. Douglas Hubbard (Reference 14) started the ball rolling as far as demonstrating that 'anything' can be measured. Our own work with PanSensics/Akumen has taken the story to the next level. Anything meaningful can be measured once you understand how to read between the lines of what people say in order to capture what they mean. Everybody lies. Every lie is detectable if you're brave enough to ask the question. Contradictions – the beating heart of successful change – meanwhile are essentially invisible to the vast majority of leaders. Because they don't see them or recognise their importance, they rarely if ever ask the data analysts to go find them. Ask the right questions – what stakeholder contradictions exist? How are they changing? What are the inter-silo contradictions? How are they changing? How many contradictions are our competitors solving? How many are we? – and meaningful answers can be found for all of them.

Tool – (Immutable) Humans

This, finally, leaves what is probably the most challenging of the strategy system elements: people. People are ultimately what makes strategy happen. People are strange. No-one comes to work to do a bad job, and yet everyone lies. People love change but they hate being changed. Our latest thinking on the people challenge is that most organisations have their people strategy 180degress wrong (Reference 15). Leaders assume that anyone with the right qualifications can be shoehorned into the pre-defined job roles. And if they don't work out, they'll replace Work Unit #555670 with Work Unit #556922, and then replace them with another hapless Work Unit until eventually one manages to do what the role demands. By which time, of course, the need has most likely changed. Banging square pegs into round holes is a pretty thankless job relying on an awful lot of luck. The emerging paradigm, meanwhile, is one that instead starts with the premise that, while humans are capable of change, better strategies emerge when we assume they won't. It's easier, in other words, to adjust the job-roles to fit the humans rather than the other way around. If the aim is 'futureproof', achieving it starts with not assuming we can teach cats to bark.

If it's possible to imagine a 6-way Venn diagram featuring each of these elements, the only reference to be found in the zone where all six intersect, we humbly suggest, is our forthcoming (promise!) FutureProof book. Very few authors, as we've tried to indicate, find their way into even one of the regions of the diagram. In theory two of the six regions – Contradictions and Directionality – could only be populated by authors familiar with TRIZ, but alas none of them has really made any kind of practical connection to the world of strategy and so those two regions are effectively empty. The other four contain books that are in effect contained within just that region. The references below indicate the ones we recommend as part of a potential strategy library. The sparseness of the list is likely indicative that the library today contains a lot of empty shelves. Which, to return briefly to Nassim Taleb, given the fragility of most organisations operating in our turbo-VUCA world shouldn't be too big a surprise.

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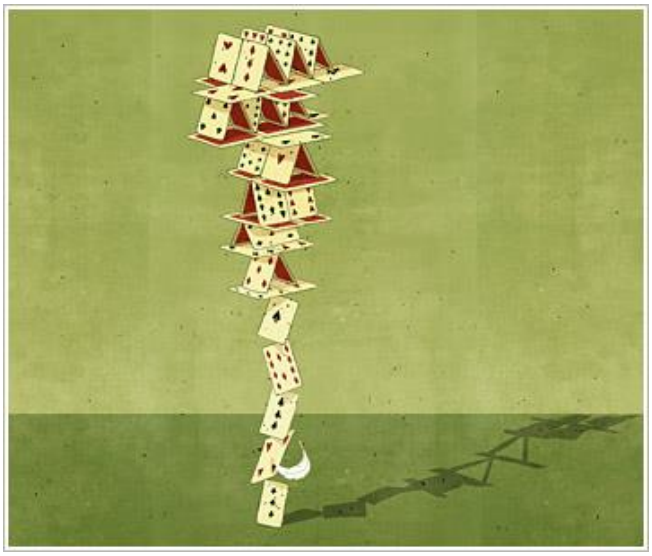
Ecosystem Innovation #23:
House Of (Symptom) Cards



"It is difficult to get a man to understand something,
when his salary depends on his not understanding it."
Upton Sinclair

Here's the first in what I imagine will turn into a comprehensive series of articles relating to the emerging ecosystem-innovation subject. The order is likely to be somewhat random, and hence the thought that we're starting here with Part 23 of an as yet unknown total. The rules of ecosystem innovation, we already know, are not the same as the still-formative rules of 'normal' innovation. By normal, we most likely mean innovation occurring in a capitalist driven economy. One driven, in other words, by competition, and the need for individual player to become biggest, best, fastest, or a combination of all three.

Principle number one as far as the shift from individual winners to ecosystems is concerned is that everyone wins or no-one wins. Easy to say, far less easy to achieve thus far.

One of the biggest impediments is that it forces organisations to deal with some of the less attractive features of capitalism. Adam Smith's famous 'invisible hand' ensures that the moment smart entrepreneurs spot an opportunity and work out how to make money from it, all the problems of the world will get fixed. Nature and Society both abhor vacuums. That's the good part. The bad part is that every solution comes attached to some kind of unintentional harmful side-effect, and when Capitalism reaches the top of its s-curve (as it has now done), the propensity of enterprises to 'externalise' those harms evolves into an imperative. In theory, government regulators exist to prevent this from happening. In practice, cunning capitalists tend to know how to create their way around the rules better than the regulators know how to stop them. Case in point: the UK's privatised water utility companies. No matter, say the capitalists, because Nature and Society abhor vacuums, some sharp, enterprising person will eventually come along and work out how to make money by turning those 'harms' (rivers filled with raw sewage, for example) into something useful.

This characteristic of the invisible hand is seen by Capitalists as generally speaking a good thing. It means they don't have to worry too much about externalities, because eventually, someone else will. Then comes the day those in charge of the harm-generating money-making machines realise that there's even more money to be had by making the harmful side-effects an integral part the business model. Better yet, an ecosystem-based business model. Good for the ecosystem players, not so good for everyone else, because in effect what has now happened is the harmful effects become locked-in to the system. And, worse, comes the realisation – not that any leader is in any way doing anything other than the best for their shareholders – that the more harmful side-effects there are, the more the ecosystem profits.

By way of example of what is now happens often enough to be referred to as the Cobra Effect, let's say a city is experiencing traffic congestion on one of its main roads. To alleviate this congestion, the city decides to widen the road and add more lanes. Initially, this solution seems effective, as traffic flow improves, and commuters experience shorter travel times. However, widening the road will lead to a series of unintended consequences:

Induced Demand: With improved traffic flow, more people may choose to drive on the widened road, attracted by the perceived ease of travel. This increased demand for road usage could eventually lead to congestion returning to previous levels or even worsening due to more vehicles on the road. The car industry, of course, benefits because the more attractive it is for people to own cars, the more they will sell. Ditto those selling 'traffic management' or, here in the UK, 'smart motorway' solutions. Especially ones that require digging the roads up again to install (see https://www.darrellmann.com/not-so-smart-motorways/).

Increased Pollution and Environmental Impact: More vehicles on the road leads to increased air pollution and greenhouse gas emissions, negatively impacting air quality and contributing to climate change. Additionally, the expansion of roads may encroach on natural habitats, leading to habitat loss and fragmentation. This now opens up opportunities for a host of pollution-handling technologies and businesses, from selling catalytic converters through to 'badger tunnels' through to an array of increasingly dubious government-sponsored carbon-capture 'solutions'.

Displacement of Traffic Congestion: Widening one road may simply shift traffic congestion to other roads in the surrounding area, as drivers seek alternative routes to avoid congestion on the widened road. This can lead to localised congestion problems in previously unaffected areas, which eventually will lead to the need for more roads and more work for the construction companies.

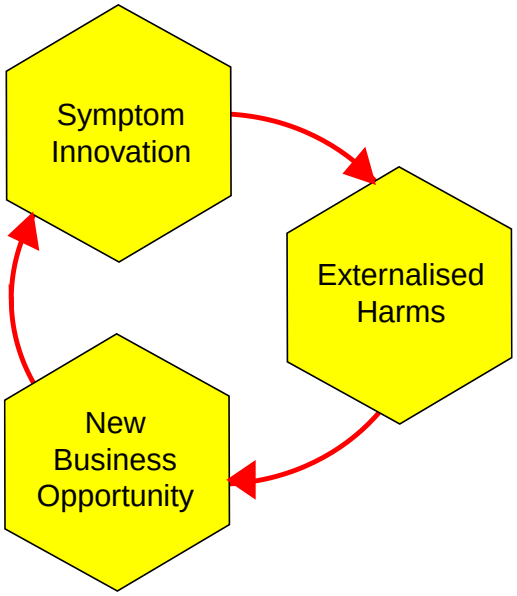
Urban Sprawl and Dependency on Cars: The perception of improved road infrastructure encourages urban sprawl as people are more willing to live farther away from city centres, relying on cars for commuting. This exacerbates traffic congestion in the long run and increases dependence on fossil fuels for transportation. Which makes the energy providers – whether fuel or electric – happy at their new sales opportunities.

Infrastructure Maintenance Costs: Expanding road infrastructure incurs ongoing maintenance costs for the city, including repairs, repaving, and upkeep of additional lanes. These costs may strain municipal budgets over time, diverting resources away from other important public services. Meanwhile, the road-repair industry has no incentive at all to build roads that don't need regular repair, and replacement. Roman-built roads lasted for

hundreds of years, the roads around me see the re-appearance of potholes hundreds of days after they were repaired.

The attempt to fix traffic congestion by widening the road initially appeared to solve the problem but ultimately led to a host of new challenges. Challenges that helped create a locked-in ecosystem of enterprises financially benefiting from the overall waste and dysfunction. An ecosystem that then works together – through the next new player in the ecosystem, the lobbyists – to convince those paying for the whole mess to keep paying for the mess. Ever increasing payments, by the way, because no doubt, all of the ecosystem players have their 'continuous improvement' targets to maintain.

Not every industry has managed to create such self-organising symptom-driven ecosystems. But wherever the stakes are highest – food and agriculture, healthcare, pharmaceuticals, etc – they surely already have. All, by the way, without the need for any kind of overt intent to create harm. Tens of thousands of well intentioned Big Pharma specialist scientists all, I'm sure, go into work each day intent on doing the best they can to develop drugs that will cure all the medical symptoms in the world. It is only the invisible hand that ends up making the long-list of 'possible side-effects' written on the side of the packet into a perpetual money making machine. A machine that inadvertently ends up creating layer upon layer of harm-fixers something like this:



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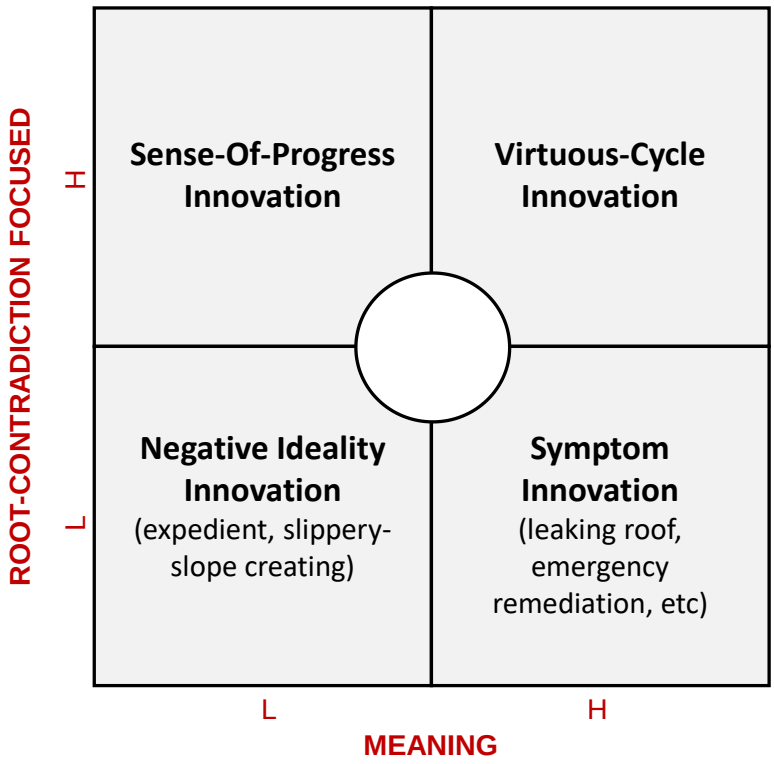
Each turn of the cycle creates another layer of harm generation. Every new harm then creates a new business opportunity, and therefore another player doing all they can to preserve the ecosystem. Including – of course – ensuring that any entrepreneur or scientist seeking to innovate by not looking at symptoms and instead focusing on fixing 'root causes' is not allowed to jeopardise the increasingly top-heavy house of cards.

It's not the intention of this article to depress readers. Whether it has made you realise you're part of a symptom-driven ecosystem, or someone with a strong desire to start heading Society in better directions by disrupting things, the actual intention is to open up potential solution directions. No innovator sets out to deliberately create harmful solution. The Law of Increasing Ideality tells us that, in the long run, only those that deliver higher ideality (more benefits, less cost, less harm) solutions will succeed.

We now live in an increasingly transparent world. Symptom-driven ecosystems have managed to emerge because for the most part the invisible hand that drove them has

enabled them to operate invisibly. Now that is no longer the case, it will increasingly encourage incumbents to do better. And if they won't, it will attract disrupting innovators with no skin in the existing ecosystems to blow them up and help create new ones. Ones based on tackling problems at their first-principle, root-cause (or, better yet, root-contradiction) level, and creating meaningful, virtuous cycle focused new ecosystems. If for no other reason that we already know that the easiest way to innovate in an ecosystem is to own all the different essential elements it contains.



Not So Funny – 40 Inventive (Tribute Band) Principles

I finally worked out why UK music venues are being overrun by tribute bands: Millennials. Heroic Millennials, who want to be heroically famous, but don't want to have to do the hard work that becoming heroic normally entails. Solution: stand on stage mimicking an actual original bunch of heroes. The only thing required, then, is a good name. An inventive name that let's the audience you've really thought about the fame thing…

Principle 1, Segmentation

Principle 2, Taking Out/Separation

'Nudist Priest'

Principle 3, Local Quality

Kansas City-based… I also quite like…

Principle 4, Asymmetry

I was confident there would be a Paul McCartney tribute band, 'Wing' somewhere and that they would make for the perfect Principle 4 illustration. Sad to say, no-one has done it (yet)…

Which basically then leaves us with…

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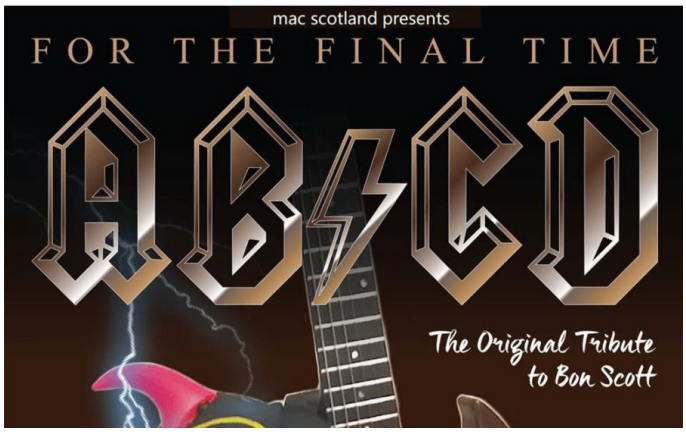
(Aja is Steely Dan's best album. It is also a palindrome… ajavu is the asymmetric version… oh, never mind…)

Principle 5, Merging

Gabba!

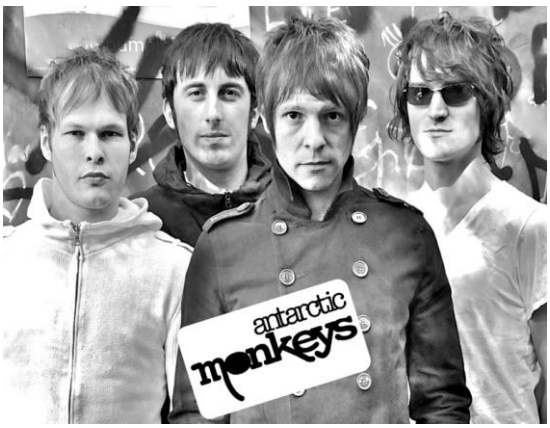
Principle 6, Universality



Principle 7, Nested Doll

Tribute band of a tribute band?

Principle 8, Anti-Weight



Principle 9, Prior Counteraction

Principle 10, Preliminary Action

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Principle 11, Beforehand Cushioning

Principle 12, Equipotentiality

Principle 13, The Other Way Around

There are a whole slew of Principle 13 female tribute bands mimicking male bands of yore. The Ramonas, Lez Zeppelin, Vag Halen, AC/DShe, ZZ Topless, Iron Maidens are tip-top names, just not quite as good as the Slade tribute band, Slady.

Principle 14, Spheroidality

Principle 15, Dynamisation

Principle 16, Slightly-More/Slightly-Less

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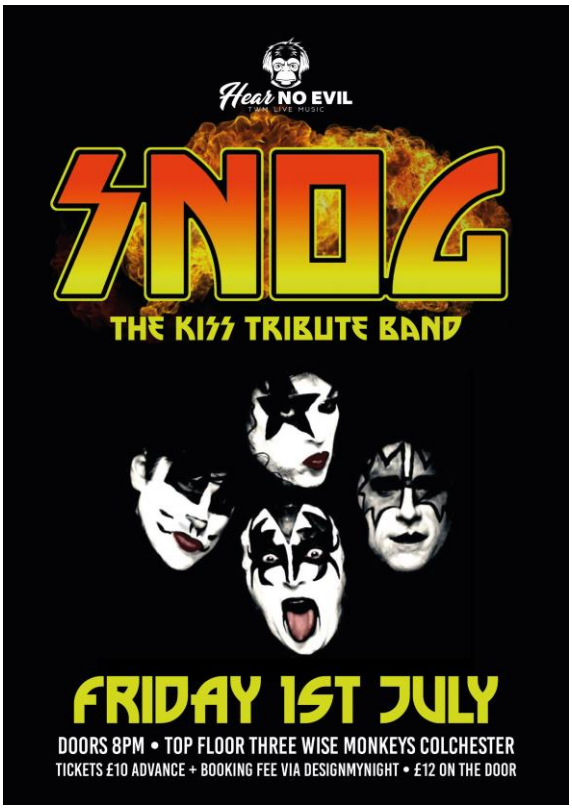
Principle 17, Another Dimension

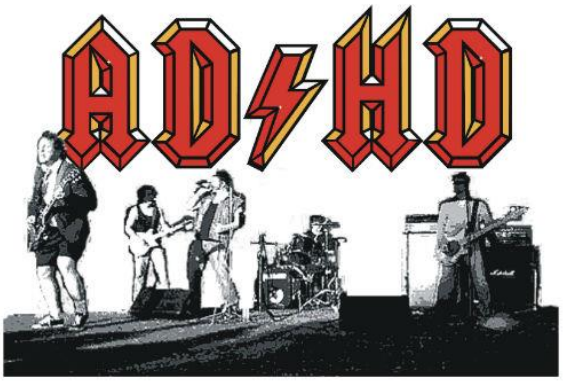
Principle 18, Vibration

Principle 19. Periodic Action

Principle 20, Continuity Of Useful Action



Principle 21, Skipping



Principle 22, Blessing-In-Disguise

Abbatoir (metal band)!

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Principle 23, Feedback

Principle 24, Intermediary

Principle 25, Self- Service

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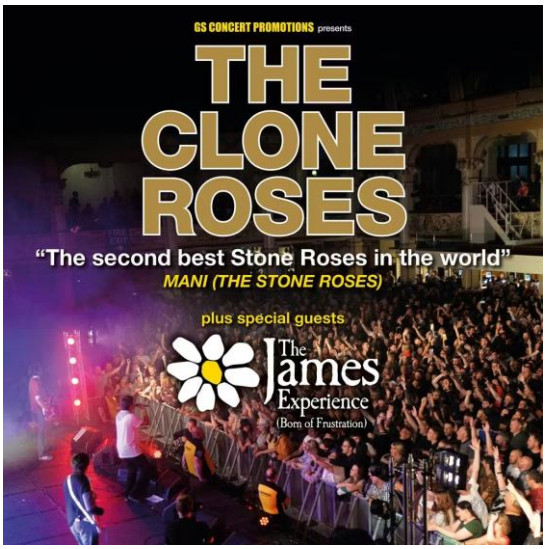
Principle 26, Copying

Principle 27, Cheap Disposable



Principle 28, Mechanics Substitution (‘Another Sense’)

Principle 29, Pneumatics & Hydraulics

Dead heat…

Or…

Principle 30, Flexible Shells & Thin Films

Principle 31, Porous Materials (‘Holes’)

Genesis Cupcakes… not strictly speaking a tribute band, but definitely making use of porous materials.

Principle 32, Colour Changes

Principle 33, Homogeneity

The Iain Duncan Smiths

Principle 34, Discarding & Recovering

The original, biggest and in many ways still the best tribute band.

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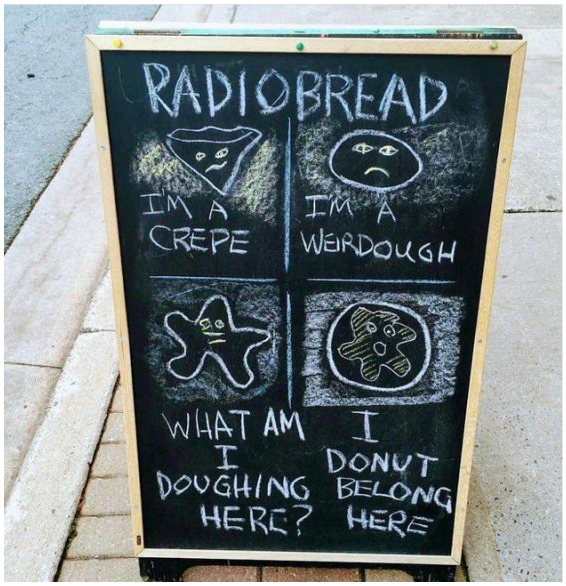
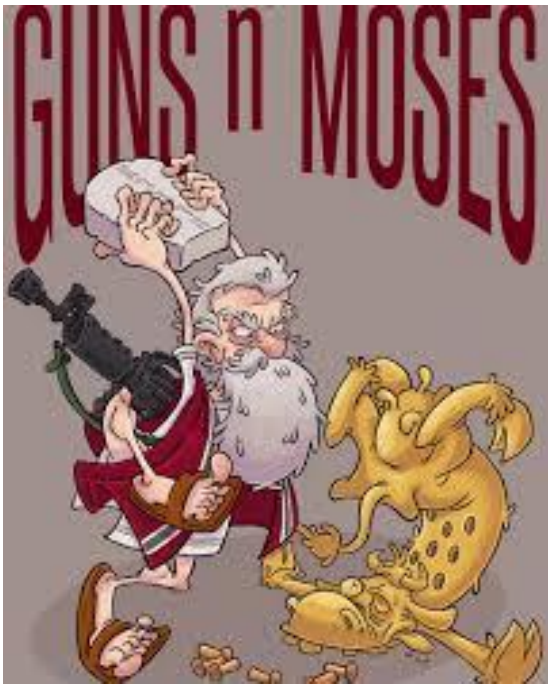
Principle 35, Parameter Changes



Principle 36, Phase Transition

Principle 37, Relative Change



Principle 38, Enriched Atmosphere

Principle 39, Calmed Atmosphere

Tip-top jazz versions of Sabbath classics by Adam Wakeman. Totally recommended.

Principle 40, Composite

Fast-Food Black Sabbath tribute. Obviously.

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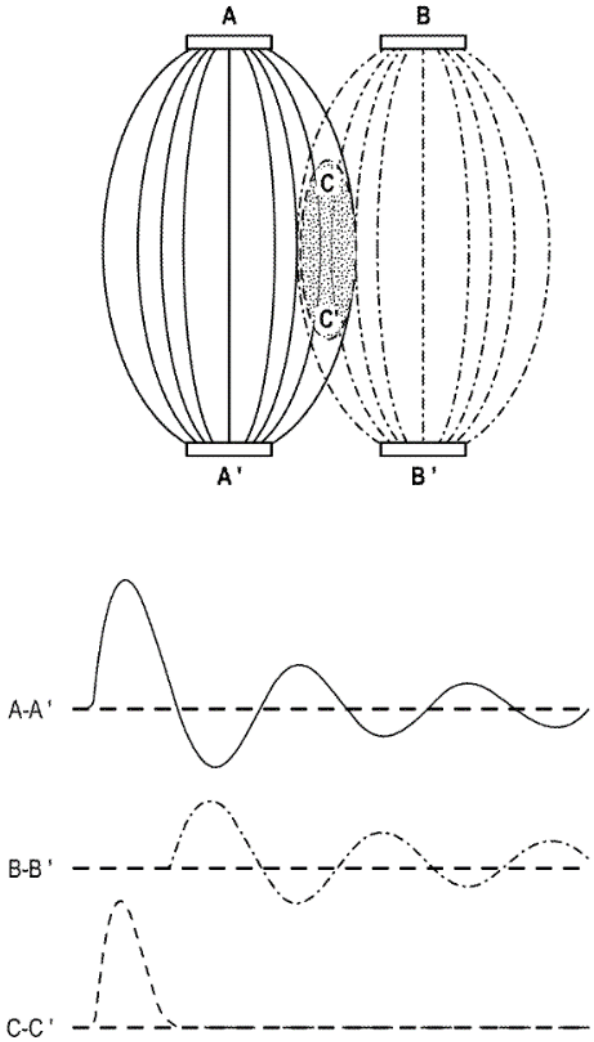
Patent of the Month – Targeted Remote Electrostimulation



A rare trip to Virginia this month. Specifically, the Old Dominion University in Norfolk, where a trio of inventors had US11,951,307 granted to them on April 9. In addition to being what looks like a very elegant solution to a tough problem, the team also needs to be congratulated for their ability to describe the problem being solved with world-record breaking brevity. Here's the entire background description:

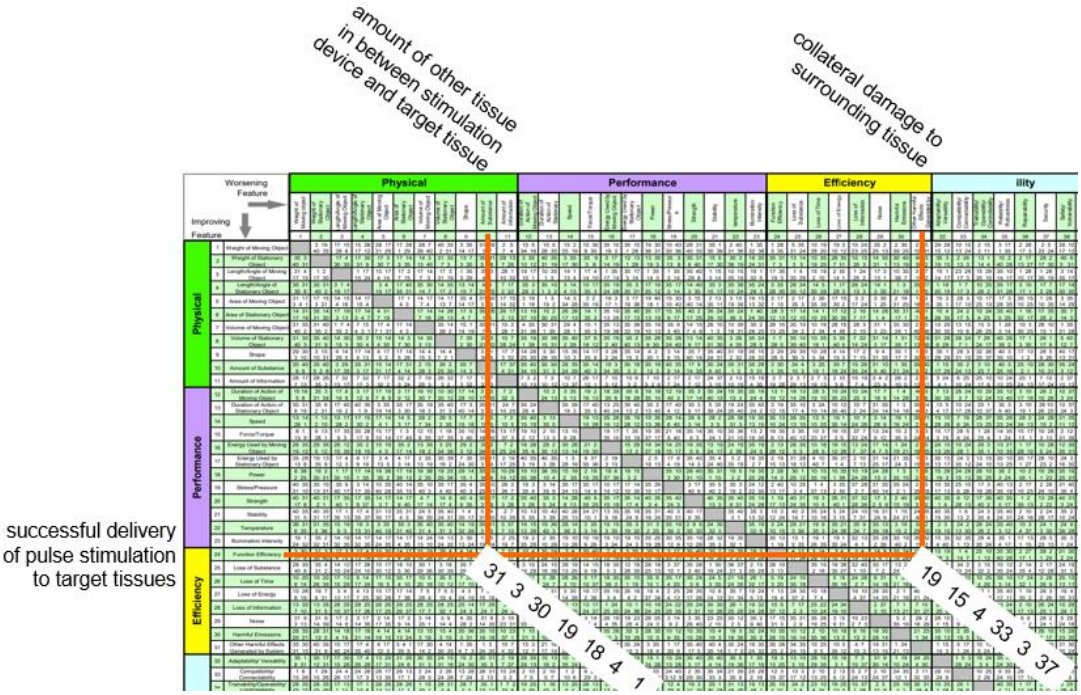
Electrostimulation (ES) is used to manipulate biological function in various applications. Nonetheless, there remains a need in the art, for example, to non-invasively target ES selectively to deep tissues and organs.

The solution description is another less-is-more brevity masterclass. Here's the first sentence of the abstract:

Provided herein are methods of generating a biologically effective unipolar nanosecond electric pulse by superposing two biologically ineffective bipolar nanosecond electric pulses…

The effective/ineffective pulse parts of the description let us know that part of the challenge of electro-stimulating deep tissues and organs is the strong likelihood of collateral damage when pulses are passed through large amounts of tissue and organ that

we don’t wish to stimulate. Here’s how we might best map the basic conflict onto the Contradiction Matrix:



Principles 18 and 19 both point towards the use of ‘pulses’; Principle 1, Segmentation is the clue that tells us we need to split the pulses into two (or more) separate pulse generators; and then Principles 3 and 4 tells us we need to think about non-homogeneity and asymmetry. Here we need to dig a little deeper into the Claims section of the patent… to find, in this case, the following Claims:

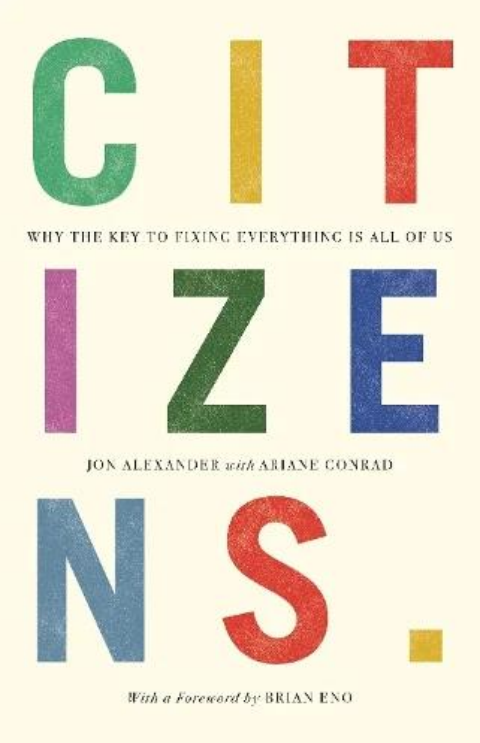
5. The system of claim 1, wherein a number of phases of each pulse of the first set of pulses differs from a number of phases of each pulse of the second set of pulses by one phase.

10. The system of claim 1, wherein at least one of the first set of pulses or the second set of pulses has multiple phases and at least one phase of the multiple phases has different duration or amplitude than another phase of the multiple phases.

…the overall idea being that – per the main Figure from the patent reproduced at the head of this article – the phase differences between the two (or more) pulses cause the net pulse to either cancel out (in tissue where we don’t want stimulation) or re-enforce one another (in tissues where we do want stimulation).

Beautiful.

Best of the Month – Citizens



"Is there any way out of the mess we're in?
"You certainly wouldn't think so from reading the papers. The richest people in the world are already scrambling onto the lifeboats, be they called New Zealand or SpaceX. And the poorest are dying in increasing numbers as they flee their war-torn, climate-ravaged countries. Meanwhile official politics seems either impotent or positively malign, a well-oiled machine infallibly finding the worst and pushing them to the top of the heap. Most of the graphs seem to be pointing in the wrong direction: going up when they should be going down, or plummeting when they should be rising.
"Yet there is hope. Because something is happening. There is a coalescence. A different story is rising and ripening. It is a story of who we are as humans, what we are capable of, and how we might work together to re-imagine and rebuild our world."

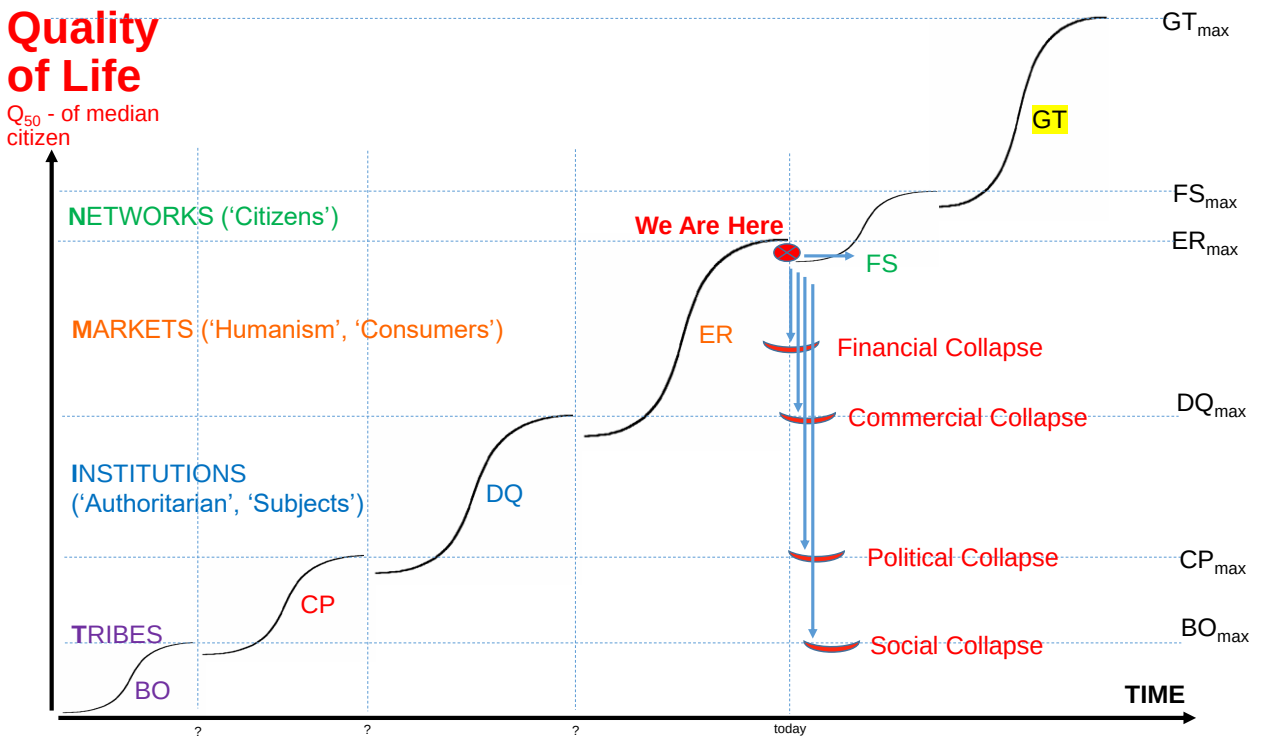
So begins the inspiring Brain Eno penned foreword to this 2022 book. A book that we only found by accident in a charity shop. Signed by the author no less. And a timely antidote to the depressing findings of our future society prognosis work of last year. Work that concluded with four possibilities of how the current societal Crisis period will pan out. The three most likely of those four options involved different flavours of totalitarianism. The least likely, but most hopeful fourth option was the one we labelled 'humanocracy'. Citizens is all about that fourth option. And, for all our readers looking for a touch of optimism in their lives, its authors compellingly argue that the Humanocracy way forward is more likely than our calculations have thus far suggested.

The book, in other words, is full of the sort of heart-warming groundswell stories that tell us 'the 99%' of citizens on the planet don't need to rely on the 1% in positions of wealth and power in order to make a positive difference to the way we work, live and play. They need someone to point them in the right direction and essentially then let them get on with making it happen. Self-organising networks of diverse, passionate people. The key word

SYSTEM ATIC INNOVAT ION

being ‘diverse’. Homogenous teams, we now know, are far more prone to groupthink and therefore agreeing far too easily on poorly thought out solutions that almost inherently then fall foul of the Law Of Unintended Consequences. Diverse teams, on the other hand, while they’re often viewed as far less efficient, turn out to be way more effective. Getting groups of people with very different views of the world together, uniting them with a common purpose and letting them have the sometimes fiery discussions necessary to reach any kind of consensus, turns out to be a far more resilient means of creating solutions that have thought through a lot of the ‘yes, buts’ that would later trigger the unintended bad consequences.

In many ways, the authors are echoing one of the main messages from our Everythink book. In that book we described the potential for society to shift to a new paradigm during the current, Covid-triggered Crisis. That new paradigm corresponds to the FS, ‘Green’, ‘Communitarian’ value system. Citizens calls this paradigm, ‘the Citizen Story’, and spends much of the book comparing it to other two dominant Story’s from mankind’s evolutionary past: the so-called ‘Consumer Story’, dominant since the 1980s (‘Orange’, ‘ER’, in the Everythink language), and the preceding ‘Subject Story’ (‘Blue’, ‘DQ’ in Everythink):



In this sense, Citizens could easily be read as a recipe book for the successful transition to the Green, Communitarian paradigm. Or at least, it is a recipe book if you’re already thinking in the Green, Yellow or Turquoise value systems. Which, admittedly is a relatively small proportion of the planet right now, but maybe enough to recognise that its not necessary to convince all the Orange or Blue thinkers to change the way they see the world, but rather to engage their existing values within self-organising clusters capable of delivering meaningful change.

If that sounds somewhat woolly and naïve, some of the stories in the book show how eminently achievable it is. Like, for example, the three-quarters of a million UK citizens that volunteered their assistance to the NHS in the first two weeks of the Covid pandemic after a request was put out for volunteers. The natural instinct of every human –

irrespective of value system – is to help. And we turn that into reality each time we tap into our Tribal nature: when there's a big problem, we pull together.

Or at least try to. The depressing coda to the NHS volunteer story is that as soon as the (Orange and Blue) people in power recognised what they'd potentially unleashed, they quickly sought to close the initiative down. Herein, perhaps lies the next contradiction needing to be solved. The 1% versus the 99%. In theory, the odds of the 1% getting their power-holding way are tiny. In practice, the 1% have realised that the way to stay in power is to control the media, control the money and, as much as possible, keep the 99% in a permanent state of debt-driven obliviousness. The biggest threat to Citizens making a positive difference is not that the messages it contains are naïve or 'wrong' in any way, but rather that those with everything to gain by maintaining the current (Orange, 'Consumer Story') paradigm or using the problems now visibly being caused by top-of-the-s-curve Orange behaviours as an excuse to swing back to communism or fascism (Blue, 'Subject Story') will find it very easy to overwhelm the Citizens message. As the book itself says, we're all of us bombarded with thousands of fine-tuned 'Consumer Story' advertising messages every day of the week. Not to mention the fact that those in power are now seeing AI as the almost perfect means of ensuring consumers continue to be fed ever more compelling reasons to continue being consumers.

(As an aside, WEF sock-puppet historian, Yuval Noah Harari, also identified the same evolutionary shifts that have occurred in Society. In his language, the (Blue) 'Subject Story' is called 'Authoritarian', and the (Orange) 'Consumer Story' is called 'Humanism'. Harari, strangely enough, although he recognises the likely emergence of a new paradigm, makes no connection to 'Citizens' or 'Communitarian' value systems. Rather he describes the next paradigm belonging to the 'Algorithm'. Which is his way of saying the powerful will stay in power because the own the AI. In this regard, it may be said that he's picked a better audience – those already in power – than Jon Alexander and Ariane Conrad. But then again 99% is still a big number. Even if only 3.5% of them hear the Citizens words and get to work.)

The AI, of course, like all technology, is merely a tool. The 3.5% could use it as well as the 1%. Especially if the 3.5% understand self-organising systems, contradiction-solving through diversity, and the enormous groundswell of global citizens increasingly recognising they're being lead on a rapidly accelerating waltz towards tyranny, but also know what 'right' looks like and have an innate desire to help move their communities in that direction.

Wow In Music – Ups And Downs

I imagine Hattie Whitehead will be a new one to most ezine readers. The most likely way you'll have heard of her is if you've had the good fortune to go see the 'Hejira' jazz-period Joni Mitchell tribute band on one of their increasingly regular round-Britain tours. Hattie sings Joni's parts rather beautifully. Probably too beautifully, because I sense Hejira's success is pulling all the fine musicians out of their own artistic orbit and into Joni's as a way of making a living. It's not easy being a musician these days. So that anything that pays the bills is going to be a big temptation. Which has thus far resulted in Hattie Whitehead producing just three digital EPs (2015, 1019 and 2023) and a one-off digital track (December 2023). All of them, though, are to be recommended.

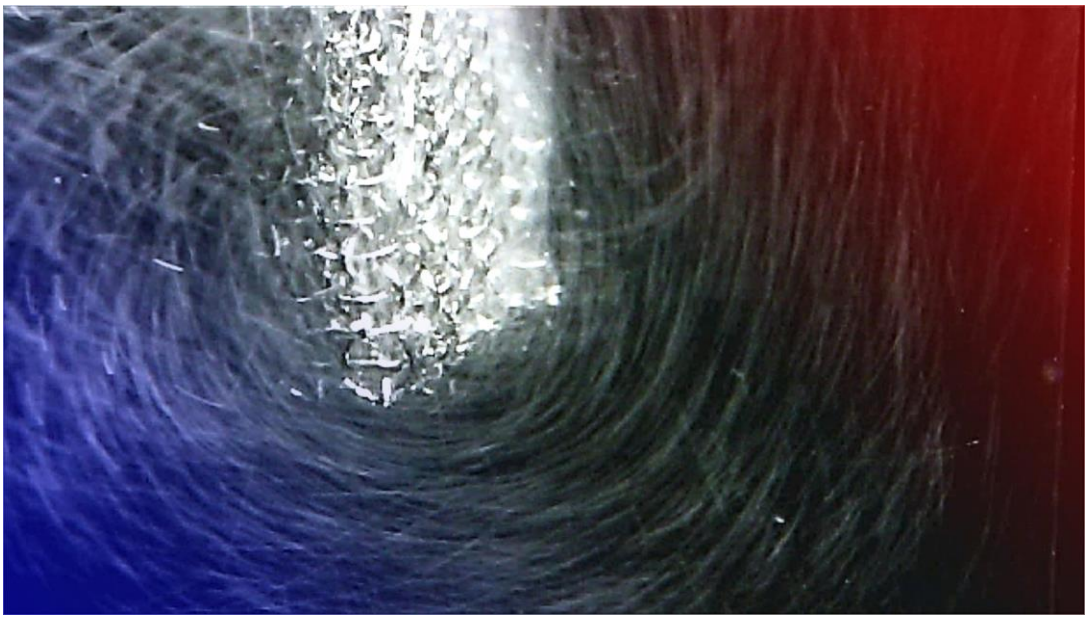
The track I've chosen that I hope might tempt listeners to go buy them is the opening track, Ups and Downs, from the 2019 EP, Old Soul. You can listen to it at https://hattiewhitehead.bandcamp.com/track/ups-and-downs, and see what might just be an even better live rendition at https://youtu.be/-gVyPCEQRLY.

There's a case for saying the whole song makes for a 'wow' – great (contradiction!) lyric, great band, great vocals – if this song had been released in the time when singer-songwriters were given due adulation I'm sure it would've been a hit. A hit that would still be receiving regular airplay on the radio today. Most likely because of the wow towards the end of the song that makes you want to go back to the beginning and play it again. And again.

The wow starts just after the 2min, 20second mark when the song begins a not-quite-chorus-not quite-middle-eight rise to a crescendo at around the three-minute mark. A stunning end to the song. Except that it isn't. Instead we get (Principle19) four bars and a pair of quiet lines to transition the song into – snare crash – the real (Principle 37) crescendo, almost a whole minute of stunningly gorgeous series of 'I'm alone' cries. Then a final return to Hattie and guitar. And then the end. And then press play again.

If (when) you like it, do the world a favour and sponsor Hattie's debut album project at:
https://www.indiegogo.com/projects/hattie-whitehead-s-debut-album#/
Best decision you'll make this year.

Investments – Magnetic Fields Boost Clean Energy



In an era where the quest for sustainable energy sources has become paramount, researchers are tirelessly exploring innovative avenues to enhance fuel production processes. One of the most important tools in converting chemical energy into electrical energy and vice versa is electrocatalysis, which is already used in various green-energy technologies.

Electrocatalysis speeds up electrochemical reactions through the use of catalysts – substances that increase reaction rates without being consumed themselves. Electrocatalysis is fundamental in devices like fuel cells and electrolysers, where it enables the efficient transformation of fuels such as hydrogen and oxygen into electricity, or water into hydrogen and oxygen, respectively, facilitating a cycle of clean energy.

But the problem is efficiency. Traditional electrocatalysis methods often fall short of maximizing the transport of reactants to the catalyst's surface, which is a key step in energy conversion. This lowers the reaction’s overall efficiency, and slows down our progress towards clean energy solutions.

Now, scientists led by Magalí Lingenfelder at EPFL in Switzerland have developed a novel approach to track the fundamental processes that enhance the efficiency of clean fuel production. Published in Nature Communications, the work focuses on the promising intersection of magnetic fields and electrocatalysis, offering a pathway to more efficient and environmentally friendly fuel production technologies.

The study showed that surrounding the catalysts with magnetic fields create Lorentz forces – the forces that magnetic fields exert on moving electric charges. These in turn induce whirling motions that enhance the movement of reactants and products at the catalyst surface, ensuring a more consistent and rapid reaction but also overcoming the limitations posed by reactant scarcity, a common hurdle in reactions like the oxygen reduction reaction (ORR), critical for fuel cells.

To do all this, the researchers had to build a tool for observing the movement of ions in real time under a magnetic field, using an advanced magneto-electrochemical setup. For the actual sophisticated setup, Lingenfelder turned to her office neighbour and spintronics

expert, Professor Jean-Philippe Ansermet, who had also studied spin effects in electrochemistry.

“We adapted Jean-Philippe's electromagnet to measure magnetic field effects on key electrocatalytic reactions for green energy,” she says. “Using a creative trick developed by Priscila and Yunchang [the first authors of the study], we were able to track in situ how ions move in the electrolyte under a magnetic field and to provide a solid ground on how to apply magnetic fields to boost electrocatalysis in a reproducible way”.

By applying magnetic fields to non-magnetic electrodes and monitoring reactions, the scientists were able to decouple the different effects and observe how magnetic forces can stir and enhance the movement of reactants around the catalyst. This process, akin to creating miniature whirlpools, significantly improves the efficiency of reactions crucial for green hydrogen production, offering a promising avenue for advancing sustainable energy technologies.

Is the new method practical? In the study, the scientists show more than a 50% boost in activity for the oxygen reduction reaction induced by magnetic fields on non-magnetic interfaces. This represents a substantial jump in efficiency, but, most importantly, allowed the team to resolve many fundamental controversies in the field by demonstrating the mechanisms and conditions needed for magnetic fields to enhance different electrocatalytic reactions involving gas products or reactants like hydrogen and oxygen.

The study charts the way towards using magnetic fields to improve the efficiency of electrocatalysis that can propel us towards more effective sustainable fuel production. It can revolutionize energy conversion technologies, make fuel cells more widely adopted e.g., in hydrogen vehicles, and increase the production of hydrogen as a clean energy source, also mitigating the impact of our energy consumption on the planet’s climate change.

As ever, ‘the field’ always wins in the end.

Read more:

Priscila Vensaus, Yunchang Liang, Jean-Philippe Ansermet, Galo J. A. A. Soler-Illia, Magalí Lingenfelder. Enhancement of electrocatalysis through magnetic field effects on mass transport. Nature Communications 03 April 2024. DOI: 10.1038/s41467-024-46980-8

Generational Cycles – Two Half-Sciences Don't Make A Whole

Here's an article I never thought I'd find myself writing. A defence of Generation Theory models. Since the time we first observed the Strauss-Howe model in the late 1990s, we instinctively disliked it and proactively set about demonstrating that it was populist half-science. Mainly by examining – via-negativa style – all of the criticisms the work generated in order to, in theory, find a higher-level model that resolved the observed contradictions. The fact that we're still writing about what is essentially still the core of the Strauss-Howe model twenty-five years later is testament to the discovery that much of what they wrote about is scientifically valid.

Throughout that time, the flow of Generation Theory detractors has ebbed and flowed. The most recent negativity peak occurred in 2021 when the strength of feeling against the use of generational labels in research provoked some 150 sociologists and demographers to write an open letter to the non-profit, influential US thinktank, the Pew Research Center in Washington D.C., asking them to stop using the terms. They argued that generations have 'no scientific basis' and 'their labels undermine important cohort and life course research'.

Admittedly this call arrived at a time when there was a corresponding surge in positive words about Generation models. Or rather authors no longer challenging their existence and instead merely assuming they represented some kind of agreed society-describing short-cut. A search for 'millennial' on PubMed for the year would have yielded 1,274 results, including a whole 2019 special issue of The Journal of Social Psychology devoted to Millennials in the Workplace, with its editorial 'Millennial research on fleek'. Google Scholar, meanwhile, had a whopping 410,000 results, with generational terms used widely in psychology, but also across fields including sociology, demography, economics and management. Perhaps it was no wonder the detractors felt a need to say something.

But there we get to the heart of the problem. What they had to say was overwhelmingly their own flavour of half-science. They might argue that this is how science is supposed to work: thesis-antithesis-synthesis and all that. But two half-sciences don't make a whole.

The Pew Research Center didn't help matters when they felt prompted – two years after they received the open letter – to pen a response (https://www.pewresearch.org/short-reads/2023/05/22/how-pew-research-center-will-report-on-generations-moving-forward/) that effectively conceded to the conflicting half scientists, concluding:

With these considerations in mind, our audiences should not expect to see a lot of new research coming out of Pew Research Center that uses the generational lens. We'll only talk about generations when it adds value, advances important national debates and highlights meaningful societal trends.

What the Pew response tells me is that, exactly like their detractors, they don't understand the scientific method, they don't understand complex systems and they don't understand discontinuity.

And without those core pieces of first-principle understanding of the world, they have no way of getting to the reality of anything. Never mind a subject as complex and potentially convoluted as the study of generational patterns.

Here's a random sample of some of the detractor half-science finding its way into supposedly professional publications:

“Generation labels are useful sometimes for referring to when certain events were happening in history and who the people were that faced said events. Other than that the whole “boomer vs millennial vs gen z(what is a gen X?) is complete trash and is only for the suckers who buy into it. We are all part of the collective human consciousness whether we like it or not. You don’t need to belong to a generation. You should think for yourself and not let make-believe things like generations define you.”
‘Unpopular Opinions’ online forum (4.2M members)

Today, the time span of a generational cohort is usually taken to be around fifteen years (even though the median age of first-time mothers in the U.S. is now twenty-six and of first-time fathers thirty-one). People born within that period are supposed to carry a basket of characteristics that differentiate them from people born earlier or later.
This supposition requires leaps of faith. For one thing, there is no empirical basis for claiming that differences within a generation are smaller than differences between generations. (Do you have less in common with your parents than with people you have never met who happen to have been born a few years before or after you?) The theory also seems to require that a person born in 1965, the first year of Generation X, must have different values, tastes, and life experiences from a person born in 1964, the last year of the baby-boom generation (1946-64). And that someone born in the last birth year of Gen X, 1980, has more in common with someone born in 1965 or 1970 than with someone born in 1981 or 1990.
https://www.newyorker.com/magazine/2021/10/18/its-time-to-stop-talking-about-generations

Research shows that millennials joining the Army now show more pride in their service than boomers or Xers did when they joined 20-plus years ago. Is this a generational effect? Nope. Everyone in the military now shows more pride on average than 20 years ago because of 9/11. The terrorist attack increased military pride across the board. This is known as a period effect and it doesn’t have anything to do with generations.
https://slate.com/technology/2018/04/the-evidence-behind-generations-is-lacking.html

Ultimately, when shared experiences and labels are scrutinised, they only serve to highlight our differences. There is no one history that members of a generation share, just as there is no one trait that sets them apart from another generation (perhaps this is why so many are convinced they were ‘born in the wrong generation’).
https://universitytimes.ie/2022/10/generations-dont-exist-why-do-we-still-use-them/

why are generational differences such a popular idea? Perhaps the biggest reason is the temptation to generalise (mainly in the negative) about the next generation. This is illustrated by the timeless quote: ‘The children now love luxury; they have bad manners, contempt for authority; they show disrespect for elders and love chatter in place of exercise…’ and so on. It could have been said today, but it’s attributed to Socrates in the 4th Century BC.
https://www.cipd.org/uk/views-and-insights/thought-leadership/the-world-of-work/generational-differences/

Ploughing through hundreds of these kinds of ill-conceived criticism, we end up with six main arguments against generation cohort theories like the Strauss-Howe model:

Overgeneralisation/Absolutism: Critics argue that generation cohort theories tend to oversimplify complex social dynamics by categorising ‘all’ individuals into broad

generational groups. This oversimplification typically ignores the diversity of experiences within each generation and overlooks the individual variability that exists across different demographic groups.

Cherry-Picking: Some critics contend that generation cohort theories rely on selective historical examples to fit their predetermined generational archetypes.

Lack of Predictive Power: Critics argue that generation cohort theories like the Strauss-Howe model lack empirical evidence to support their predictive power. While these theories may offer retrospective explanations for past events, their ability to accurately forecast future societal trends and behaviours is questionable.

Ignoring Socioeconomic Factors: Critics suggest that generation cohort theories often overlook the influence of socioeconomic factors such as income inequality, access to education, and employment opportunities on generational attitudes and behaviours. These factors may have a more significant impact on shaping individual outcomes than generational membership alone, and in any event, are difficult if not impossible to untangle.

Cultural and Global Variations: Critics argue that generation cohort theories don't adequately account for cultural and regional variations in attitudes, values, and behaviours. Generational trends observed in one country or culture may not necessarily apply universally to other societies with different historical contexts and cultural norms.

Confirmation Bias: Critics caution against the tendency to interpret current events through the lens of generation cohort theories, which may lead to confirmation bias. Instead of objectively analysing events, there may be a tendency to selectively interpret evidence to confirm preconceived generational narratives.

The latter point also appears, crucially, to affect those that 'don't believe' in generational models. Ironically, it is the tendency for every human on the planet to 'suffer from' not just Confirmation Bias, but a couple of hundred other ones too, that helps produce actual generational patterns in the first place.

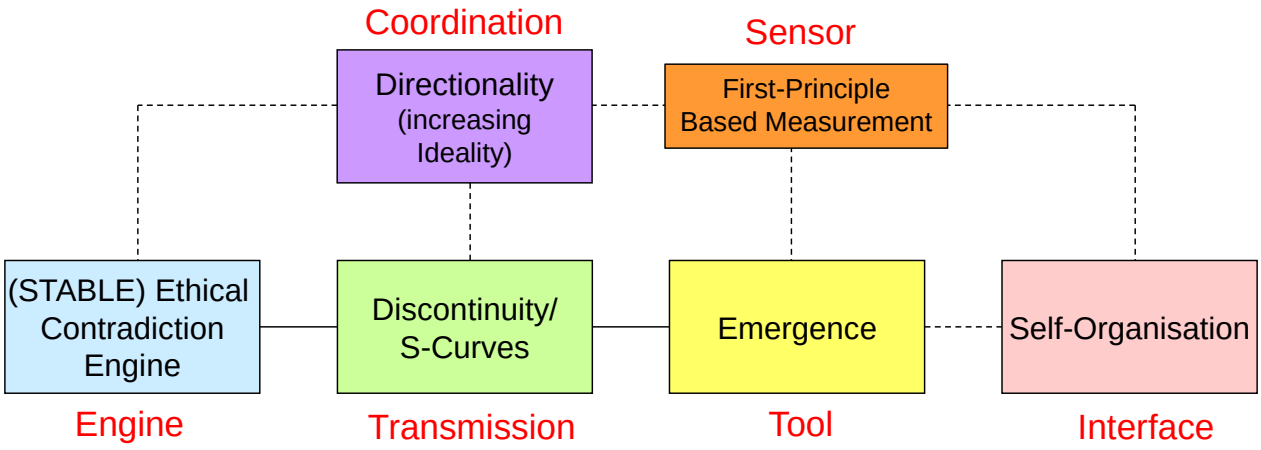
Alas, it is not for the SI research team to be the arbiters of factual reality when it comes to the existence or otherwise of generational patterns. Factual reality, nevertheless, is what we seek. And getting there, we know, demands a system. The fact that others working in the field don't seem to understand this core principle means that it is relatively easy to distinguish between the scientists and the half-scientists of the world.

If the question for any of us is, 'should I take heed of what this author/researcher/etc is saying?' when we encounter either a pro- or anti- generation theory mention, the answer comes from applying these six tests:

1) Do they understand complex systems and particularly the concept of emergent behaviour driven by core underlying principles?
2) Do they understand discontinuities and tipping points (s-curves) and the dynamics of discontinuous change?
3) Do they understand the role of contradiction solving as the primary mechanism of breakthrough change (i.e. are they able to escape from the tyranny of either/or thinking and the oscillatory societal patterns it produces)?
4) Do they understand the principles of self-organising, self-re-enforcing systems in the emergence of virtuous and vicious cycles?

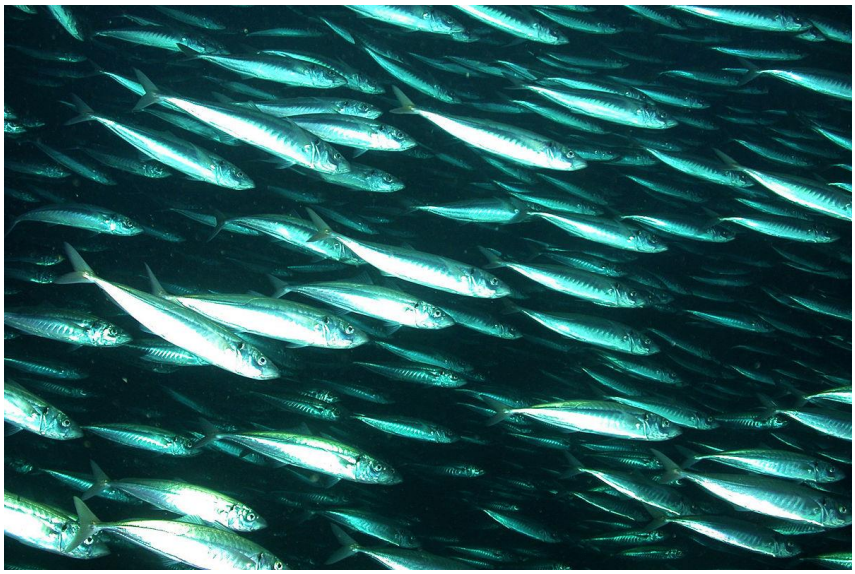
5) Do they understand the need to measure what is important rather than merely expedient (i.e. the need to measure the core underlying principles from which society emerges)?
6) Do they understand the existence of an overarching direction of travel ('vector') of societal evolution?

Six tests. Sounds like a system. A system for understanding complex systems. Something like this:



If the answer to any one of these questions is 'no', the message should be treated with extreme caution, and probably ignored. Which offers the added advantage of now being able to safely ignore about 98% of the generation-related 'content' out there. You're welcome.

Biology – Mackerel



Swimming in schools makes fish surprisingly stealthy underwater, with a group able to sound like a single fish. The new findings by Johns Hopkins University engineers working with a high-tech simulation of schooling mackerel, offers new insight into why fish swim in schools and promise for the design and operation of much quieter submarines and autonomous undersea vehicles.

"It's widely known that swimming in groups provides fish with added protection from predators, but we questioned whether it also contributes to reducing their noise," said senior author Rajat Mittal. "Our results suggest that the substantial decrease in their acoustic signature when swimming in groups, compared to solo swimming, may indeed be another factor driving the formation of fish schools."

The team created a 3D model based on the common mackerel to simulate different numbers of fish swimming, changing up their formations, how close they swam to one another, and the degrees to which their movements synched. The model, which applies to many fish species, simulates one to nine mackerel being propelled forward by their tail fins. The team found that a school of fish moving together in just the right way was stunningly effective at noise reduction: A school of seven fish sounded like a single fish.

"A predator, such as a shark, may perceive it as hearing a lone fish instead of a group," Mittal said. "This could have significant implications for prey fish."

The single biggest key to sound reduction, the team found, was the synchronization of the school's tail flapping -- or actually the lack thereof.

If fish moved in unison, flapping their tail fins at the same time, the sound added up and there was no reduction in total sound.

But if they alternated tail flaps, the fish cancelled out each other's sound, the researchers found.

"Sound is a wave," Mittal said. "Two waves can either add up if they are exactly in phase or they can cancel each other if they are exactly out of phase. That's kind of what's happening here though we're talking about faint sounds that would barely be audible to a human."

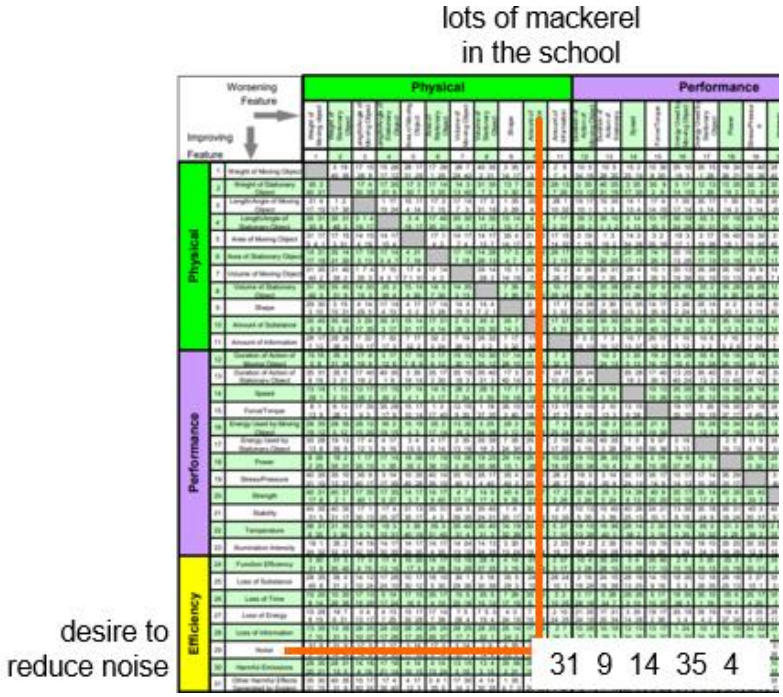
The tail fin movements that reduce sound also generate flow interaction between the fish that allow the fish to swim faster while using less energy, said lead author Ji Zhou, a Johns Hopkins graduate student studying mechanical engineering.

"We find that reduction in flow-generated noise does not have to come at the expense of performance," Zhou said.

"We found cases where significant reductions in noise are accompanied by noticeable increases in per capita thrust, due to the hydrodynamic interactions between the swimmers."

The team was surprised to find that the sound reduction benefits kick in as soon as one swimming fish joins another. "Simply being together and swimming in any manner contributes to reducing the sound signature," Mittal said. "No coordination between the fish is required."

From a conflict-solving perspective, what we can see from the mackerel story is a classic noise versus number of fish problem. Here's what the Contradiction Matrix has to say about how others have solved similar challenges:



Probably easiest to get to the *non*-coordinated tail-fin movement solution from Principle 4, Asymmetry, but I guess Principle 9, Prior Counteraction would also likely get us to where we need to be. Note too the similarities between this case and this month's Patent Of The Month winner.

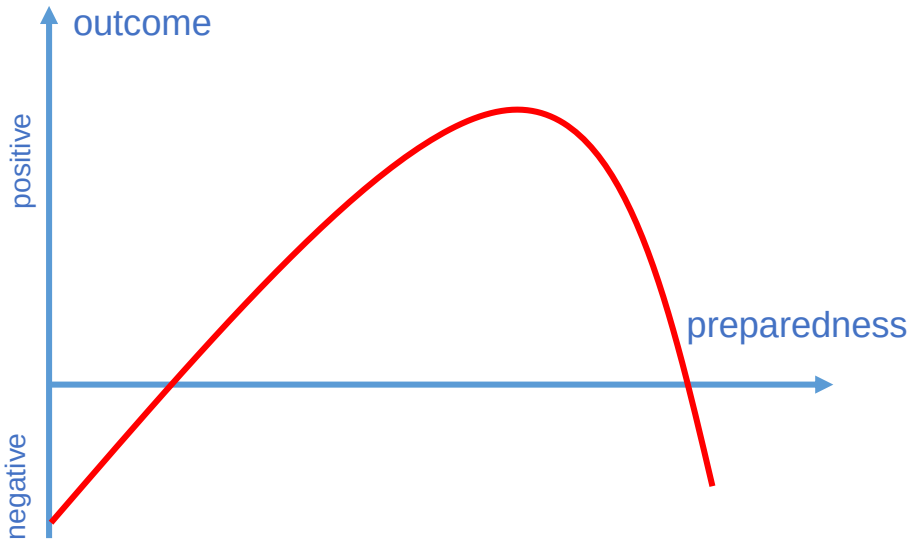
Read more about the mackerel story:
Ji Zhou, Jung-Hee Seo, Rajat Mittal. Effect of schooling on flow generated sounds from carangiform swimmers. Bioinspiration & Biomimetics, 2024; DOI: 10.1088/1748-3190/ad3a4e

Short Thort

Goldilocks Curves #358

"Preparation is the be-all of good trial work.
Everything else
– felicity of expression, improvisational brilliance –
is a satellite around the sun.
Thorough preparation is that sun."
Louis Nizer

"Over-preparedness has stopped you your whole life from doing what you want to do."
Richie Norton



News

ICSI Conference
Darrell has been invited to provide a keynote address at this year's International Systematic Innovation conference. He'll be presenting virtually; the conference will be happening virtually and in-person at Bursa Technical University in Turkey. 23-25 August are the dates for your diary. More details: https://i-sim.org/icsi2024/

Denmark
Darrell has been invited back to Copenhagen to teach an innovation weekend on DTU's EMBA programme. A little earlier than previous years, he'll be at the University on the 30th and 31st of August. If anyone else in the region is interested in doing something either before or after, let him know.

India
It looks like various members of the SI team will be ferrying back and forth to India on a regular basis for the next twelve months working on a succession of client projects. Los of opportunities, therefore, to piggy-back other face-to-face jobs if anyone is interested. In the first instance, get in touch with Darrell if you'd like to explore possibilities.

New Projects

This month's new projects from around the Network:

- FMCG – Long-Term Innovation Strategy Project
- Electronics – SI Workshops
- Automotive – SI Workshops
- O&G – Troubleshooting Workshops
- Electronics – Troubleshooting Workshops
- NGO – Strategic Options Planning Project
- FMCG – SI Workshops
- Finance – Disruption Strategy Project
- Healthcare – Concept Design Study
- Transport – Measurement-Design Project
- Logistics – SLT Black-Swan Strategy Workshop
- Fashion – Innovation Mentoring Programme