

Systematic Innovation

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Our guarantee to the subscriber is that the material featured in the e-zine will not be published elsewhere for a period of at least 6 months after a new issue is released.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

Instinct?

“The first question at the job interview is never, ‘Do you think you have good instincts?’ Instead, you are asked about your training; questioned on what you are qualified to do. The interviewer is looking for the certainty of you learning and the quality and depth to which it is ingrained in you. Of course, a good education is not a bad thing, But it seems to come at a terrible cost. Higher education usually has the unhappy knack of planning off the rougher edges of instinct. To listen to your inner voice, to take a chance, to believe because the feeling says so, is just too flaky...”

“Yet, when you’re desperate for an idea, it’s [instinct] the most precious commodity on earth. At the early stages of something new, that’s often all you’ve got. An instinct, an inner twitch in your gut, that says you might be on to something big. Way before a thought can evolve into something we believe in, it floats in the primitive soup of instinct. Those who come up with the best ideas are those that are comfortable with the fact that, sometimes, you just know before you know why. Sadly, we’ve been taught the opposite is true. The why is not allowed to slowly mature. If reason cannot be immediately articulated, you’re forced into the corner and told to wear the dunce’s hat.

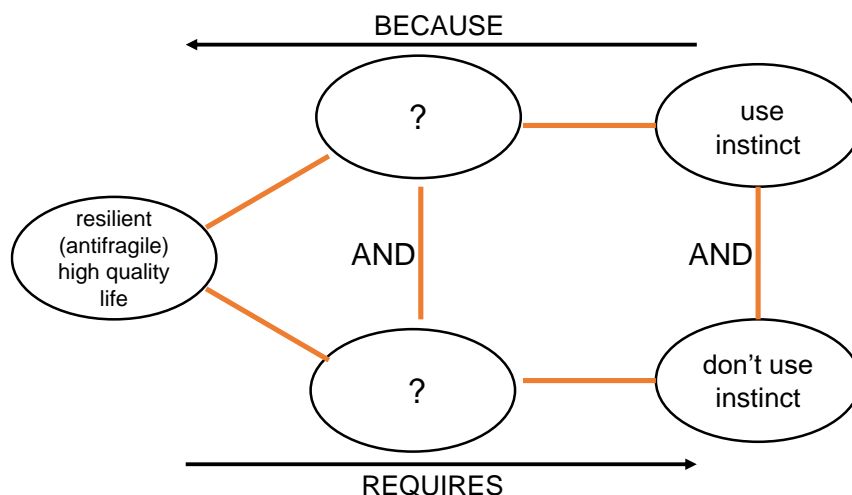
“Nothing is more depressing than being in a room with people who have had their instincts beaten out of them. They look at you with the doleful eyes of neutered cats.”

John Hunt (Reference 1)

I’ve found myself saying, ‘my instincts tell me...’ quite a lot these days. Which, for someone who’s role in life is effectively extolling the merits of evidence-based objectivity can easily come across as very un-systematic. I have worried about this a lot.

Then I read the John Hunt quote above. It made me feel better for a while. Then, in my usual ‘run-towards-the-difficult’ DNA it became clear that a big part of the reason the world is in the middle of an omni-crisis right now is because lots of people – especially politicians and those in positions of power – have been relying on instincts that have turned out to be borderline terrible.

The implication being that there’s a contradiction. Instincts are both good and not good. It felt like time to construct a Bubble Map. After what felt like an embarrassingly long period of time, here’s what I ended up with:



What were the question marks? Why is it good to use our instincts? Why is it not good to use them?

If I was looking for a succinct, all-encompassing replacement for the question marks, my usual ability to incubate my way to an answer (damn, does that mean using my instincts?) has let me down.

Which usually means that I haven't got a critical mass of information upon which to incubate. Which in turn meant a need to look deeper into the pros and cons of using our instincts. John Hunt is clearly in the 'pro' camp. Who else is there?

At the beginning of our recent DangerMouth conversation with Baxter (Reference 2), he talks about involving the local community as judge and jury when he's created a possible solution to a challenging architectural problem. This seems like a clear illustration of one of Christopher Alexander's principles: people instinctively know what 'good' architecture looks like. Their instincts, Alexander hypothesised, revealed good architect to be 'most like me'. This was one of the reasons I suspect Alexander has always been a controversial amongst the architecture community. What he's saying here sounds at first blush to pretty much be the opposite of evidence-based objectivity.

The concept of the "good architect as that which is most like me" is found in Christopher Alexander's book "The Timeless Way of Building" (Reference 3). In this work, Alexander explores the idea of a deep connection between the designer (architect) and the built environment, suggesting that the best designs are those that reflect a kind of "wholeness" or "living quality" that resonates with human nature.

Alexander argues that great architecture arises when the designer creates in a way that is true to their own experience of life, embodying what he calls the "quality without a name"—a quality that makes spaces feel deeply human, alive, and connected to the essence of the people who inhabit them. This concept reflects the notion that the architect should design in a way that mirrors their own understanding of life and what feels most natural and human, which ties into the idea that the best designs are those that are most "like me" or reflective of the architect's true self.

Baxter didn't mention Christopher Alexander, but he did mention Sir Francis Galton and his part in the discovery of what the world at large now understands as the 'wisdom-of-the-crowd'. The classic wisdom-of-the-crowds finding involves point estimation of a continuous quantity. At a 1906 country fair in Plymouth, 800 people participated in a contest to estimate the weight of a slaughtered and dressed ox. Statistician Francis Galton observed that the median guess, 1207 pounds, was accurate within 1% of the true weight of 1198 pounds. This has contributed to the insight in cognitive science that a crowd's individual judgments can be modelled as a probability distribution of responses with the median centred near the true value of the quantity to be estimated.

So much for the pro-instinct side of the argument. Funnily enough, the Baxter conversation also gave us an insight into the other side of the argument. The reason for wanting to talk to Baxter was that he's the creator of some of the most 'out-of-the-box' inventions I've ever had the pleasure to witness. Solutions that, the moment you've seen or heard them for the first time, you're kicking yourself that you didn't think of them first. Inventions that are literally the polar opposite of the wisdom of the crowd. The crowd had spent hundreds of years in some of his cases doing things that had become the default solution and were now revealed as the opposite of wisdom. These kinds of invention demonstrate the workings of a person that is able to think beyond the instincts of everyone

else to find a better way of doing things. Either that or they represent the outpourings of a person with a higher level of instinct than the rest of us.

Another saying I've been using a lot lately is, "it is difficult to get a man to understand something when his salary depends on his not understanding it" from American novelist and social reformer, Upton Sinclair. Regarding instinct and the John Hunt quote, perhaps the clue offered by Sinclair is that money adversely affects our instincts? That we should listen to our instincts when they're operating without bias, and not listen to them when we are?

That, ultimately, doesn't work of course, because we're all crammed full of biases. Usually ones that we're blind to the fact that we have them. It may be plausible to fill in the question marks in the earlier Bubble Map with something to do with the biases problem, but I'm not sure it would be helpful.

The problem here is that our biases in many cases are informed by 200,000 plus years of evolutionary pressure. Those of our ancestors that survived were not the ones that listened and looked for objective reality, they were the ones that did what the rest of the tribe did. Our instincts, in other words, are informed by a couple of thousand generations of doing what we needed to do to have the rest of the tribe want us to be there with them. Plus, for most of those generations, if life changed at all it changed very slowly. Which meant that we built a tribal instinct that taught us when change did happen, it happened in a linear fashion.

We now know that the world of change is anything but linear. It is either exponentially increasing or exponentially decreasing. It is s-curved shape. We know this because we are now surrounded by myriad aspects of life that are on the verge of or in the middle of discontinuous change. Change that reveals our assumptions about the world and the 'rules' we operate by are frequently wrong. This, I contend, is the main reason why we should not rely on our instincts. They are built on poor evolutionary foundations.

But yet again I'm torn. This time because I've spent the last forty years of my life in effect re-training my brain – limbic and amygdala especially – to deliberately look for and focus on the discontinuities and, by extension, the contradictions that will eventually throw us into a better world. In my mind, I've consciously and subconsciously retrained my instincts to see non-linearity.

I also know I need to be constantly on my toes, mentally (is that a mixed metaphor?) and that I'm very fallible. And that Steven Johnson's 'slow hunch' thinking (Reference 4) needs to play a role in any kind of intentional breakthrough I might think I've created. With that in mind, I've concluded there is no succinct, all-encompassing replacement for the Bubble Map question marks. What there is instead is a table describing the conditions when a person should or should not rely on their instincts or intuition. It currently looks something like this:

Safe to rely on instinct	Safe to rely on (Green World (Reference 5) informed) instinct	Not safe to rely on instinct
<ul style="list-style-type: none"> - non-complex, bounded problems where 'wisdom of the crowd' applies - non-complex, - continuous improvement', linear, 	<ul style="list-style-type: none"> - exponential/discontinuous Hero's Journey situations - Evolution Potential, TRIZ Trends of Evolution and convergent evolution - contradiction finding 	<ul style="list-style-type: none"> - Butterfly Effect, high-liminality complex situations - Whiplash effects - Red-Bull Effect (game-changing)

<p>incremental change issues</p> <ul style="list-style-type: none"> - IFR (I've never met a workshop group yet that can't define the 'perfect' version of a product or service within a few minutes) - When we see a speaker has vested interests and is therefore not telling us the truth ('they would say that...') - Knowing that 'everybody lies' because our 'good' reasons are different from our 'real' reasons 	<ul style="list-style-type: none"> - the inevitability that contradictions will eventually be resolved/ eliminated - 'kicking cans down the road', 'slippery slopes' and fragility-increasing 'solutions' will inevitably make the eventual resolution of a problem far worse than solving it now 	<p>products that all the original market research said tasted terrible, looked like urine and would never work)</p> <ul style="list-style-type: none"> - Green World projects that are progressing 'exactly to plan' - ego/hubris-driven, ideologically-driven, politicking projects - locked-in ecosystems - moral/ethical trade-off 'solutions'
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If we are to have a hope of solving the instinct/no-instinct contradiction, it will involve separation by one or more of a large portfolio of different conditions.

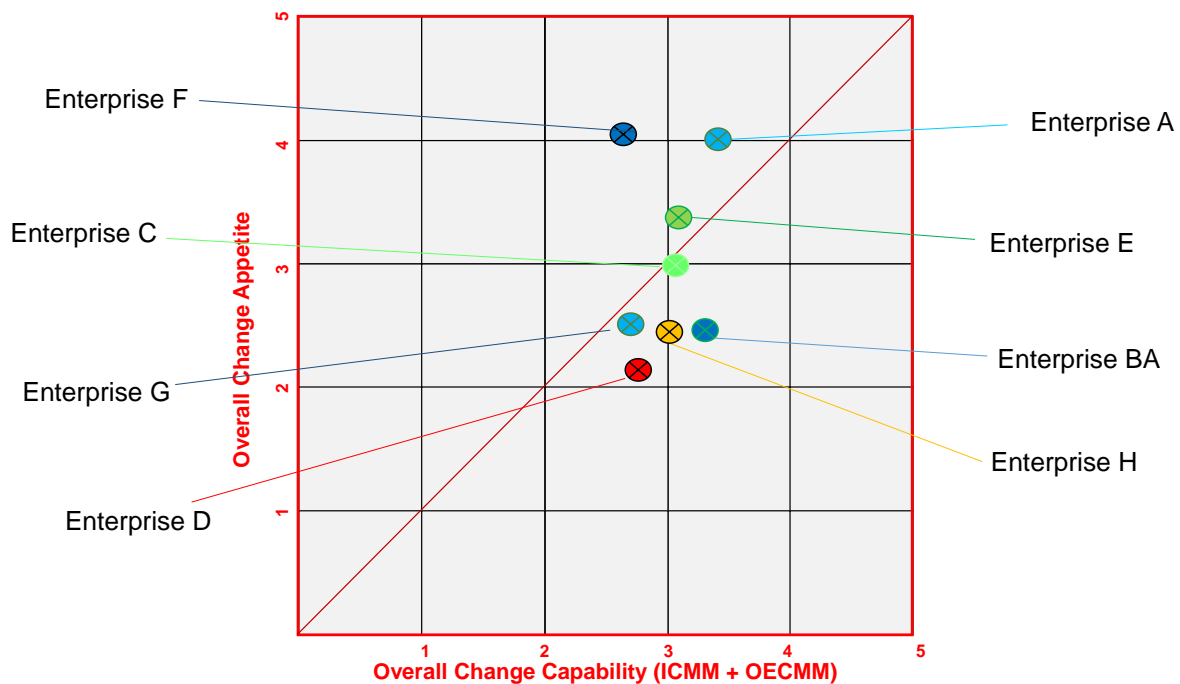
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- 1) Hunt, J., Nhlengethwa, S., 'The Art Of The Idea And How It Can Change Your Life', PowerHouse Books, 2009.
- 2) <https://www.dangermouth.org/s2e01-force-of-nature-baxter/>
- 3) Alexander, C., L., 'The Timeless Way Of Building', Oxford University Press, 1979.
- 4) Johnson, S. 'Where Good Ideas Come From: The Natural History of Innovation', Allen Lane, 2010.
- 5) SIEZ, 'Red World/Green World', Issue 231, June 2021.

Change Appetite

It didn't take long after we'd first published the Innovation Capability Maturity Model (ICMM) that we realised Innovation Capability and Operational Excellence Capability were coupled to one another. Even though the two activities are polar opposites from almost every perspective, the advancement of one will sooner or later be impeded by a failure to advance the other. We first wrote about our Operational Excellence Capability Model and its lock-step relationship with ICMM in March 2021 (Reference 1).

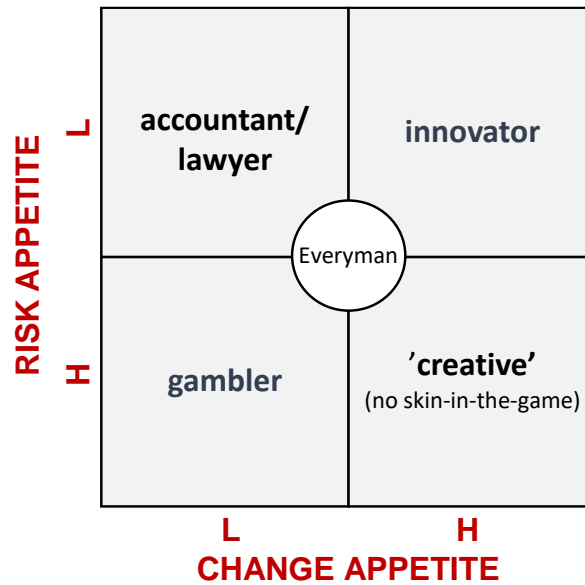
It didn't take long after that for clients to start asking for ways of integrating the two measures – one incremental and one discontinuous – to produce an overall Change Capability measure. And it didn't take much longer for them to then start recognising the truth of our longstanding aphorism, 'people love change, they hate being changed', and to also want a way of measuring 'change appetite. Here's the sort of output we worked out how to provide them:



Stating the goal is often half the battle with these kinds of new-measurement challenge. In many ways, the basis on which PanSensic is built is, first establish what you'd ideally like to know, and then work out how to measure it. Crucially this also means not allowing the difficulties of achieving the second part to compromise the first.

Before getting into that detail, having stated the desired (ideal) what-to-measure goal, the immediate next requirement is to make sure that we understand what we mean and what is the underlying purpose of wanting to know what the result means. In this regard, the immediate confusion when trying to explain the capability to prospective new clients was how 'change appetite' differed from 'risk appetite'. Most senior leaders are familiar with the latter concept, but almost none are familiar with the former. Which means as soon as they hear the former term they tend to assume it is synonymous with the latter.

In reality, once we understand what it is we're trying to achieve, it becomes clear that the two parameters are orthogonal. We can quickly demonstrate the truth of this when we use them to construct a simple 2x2 matrix like this:

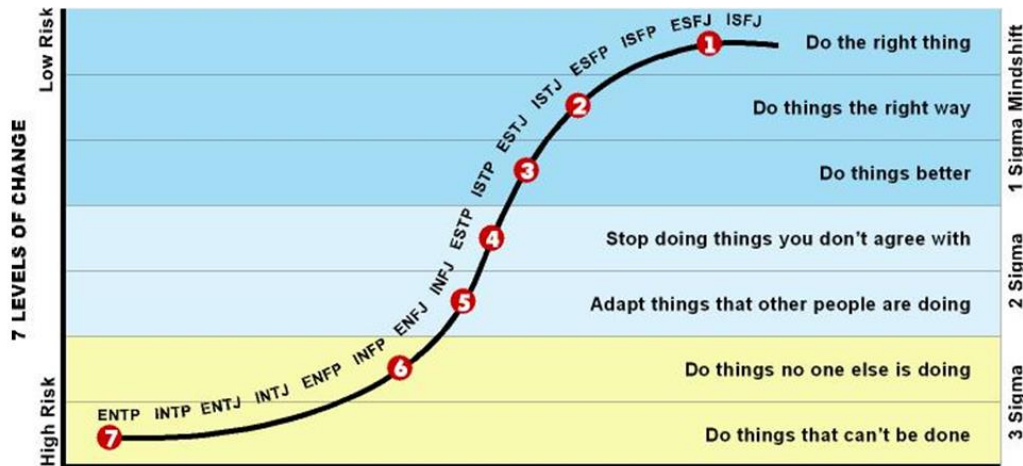


Now it becomes clear that it is perfectly possible for an enterprise (or team, or individual for that matter) to have a high appetite for risk but a low appetite for change. In lay-person terms what this combination of traits describes is a gambler. The person that loves betting on horses and has no interest in changing their behaviour because, win or lose, they love betting on horses and are going to keep doing it. This is a common combination of traits. The other two common variants are the Red World people – starting with accountants and lawyers – who see their role in life to achieve maximum stability and predictability, and then the ‘creatives’ that are desperate to change everything and assume that that only happens if they also have an enormous appetite for risk. These are the ‘viruses’ in Red-World dominated enterprises. They are seen by others as viruses largely because they have little if any actual skin-in-the game. Another commonly used aphorism in the SI-world these days is ‘no skin in the game, no innovation’. Which is a way of also recognising that there’s a fourth box in the 2x2 matrix. One that is rarely observed in practice. The box labelled ‘innovator’. The box in which people are readily accepting of change, but, wishing to solve the usual contradiction, are less happy accepting risk. These are typically the 2% of people that succeed with their innovation attempts, rather than the 98% that live in one of the other three boxes. They typically also understand something – explicitly or implicitly – of ‘systematic’ innovation and the viability of successfully changing without all the usual (historical) randomness that tends to come with it.

Once we recognise that change appetite is not the same as risk appetite and that our ideal is to find people, teams and enterprises that aspire to be in the top-right corner of this matrix, we can then begin the process of working out how to measure what it is that we need. Namely, a way of identifying how open people are to the prospect of change. And, perhaps even more importantly, thinking back to the earlier aphorism, potentially ‘being changed’.

Here's where we then need to get back to first principles and ask the question, ‘what are the traits that we need to be looking for inside enterprises that possess a higher level of openness to change. Here are the ones that we have thus far been able to build into an automated PanSensic lens capable of making sense of unstructured narrative data...

- ...Relative to low-change-appetite people, high change appetite people have:
- (top of the criteria importance list) a higher than average level of the Yellow (GT) score in their value system profile (Reference 2).
 - A lower than average level of the Blue (DQ) score in their value system profile.
 - Myers-briggs profiles that are in the yellow zone in the s-curve model (NB: even if we are looking at incremental as well as discontinuous change situations, the yellow zone strongly correlates to openness relative to the blue zones)



- A higher level of 'Starter' than 'Finisher' character traits, especially if combined with a high level of 'Catalyst' behaviours
- A higher than average 'Warrior', and especially a high 'Magician' score on the life-stage archetypes lens (Reference 3)
- A higher than average 'Forward' score on the Forwards/Backwards ratio measurement lens (Reference 4)
- A higher proportion of Green World thinking than the 'norm' ratio of 94% Red to 6% Green (again, Red World people 'will' change, but their natural propensity is to seek stability and only deviate from it when provoked).

Where possible, it is desirable to focus these measurement lenses on the individuals in positions of power within an organisation. We know that in most organisations, what gets people promoted up the hierarchy is being good at the Red-World activities. This means that the decision makers at the top tend to prefer stability to change, and hence overall organisational change appetite tends to be significantly lower than in enterprises where the people at the top are Green-World aware. And, ideally, have spent some actual time acquiring Green World battle scars.

As with all things PanSensic-wise, the key to success is not so much the absolute measurement, but one that relativises one enterprise against other competing enterprises. It's not about running faster than the bear, it's about running faster than the other people the bear is chasing.

Reference

- 1) SIEZ, 'Operational Excellence Capability Maturity Model (OECMM)', Issue 228, March 2021.
- 2) Mann, D.L., Ford, B., 'Everythink', IFR Press, 2020.
- 3) SIEZ, 'PanSensic: Life-Stage Archetypes Tool', Issue 145, April 2014.
- 4) SIEZ, 'PanSensic: Forward/Backwards Ratio Measurement Tool', Issue 143, February 2014.

Used To be Funny – Four Parables

You probably heard this first one. It has gone viral a couple of times over the course of the last ten years. A new wave seems to be happening right now...



A rural middle school in Northwest Florida was recently faced with a problem. A new fad arose amongst the 8th grade girls with the use of lipstick. They began bringing, sharing, and trading with their friends to try out all the new styles and shades. The gathering point for this activity was one certain bathroom at the school. That was fine, but after they tried out all of these lipsticks they would press their lips to the mirror, leaving dozens of lip prints every day.

Every night the janitor had to spend an age cleaning them off, only to find that by the end of the next day the girls would have put more lip prints on the mirror. The school Principal decided that something had to be done. So she put out a personal announcement onto the school tannoy system telling all of the students that they were to stop putting lip-prints on the rest-room mirrors. Perhaps not surprisingly, this made the problem worse.

Then the janitor had an idea. He asked the principal to invite the most influential, pack-leading girls to the restroom to meet both of them.

Once gathered, the Principal explained that all these lip prints were causing a major problem for the janitor who had to clean the mirrors every night. To drive the point home, she asked him to demonstrate to the girls what a pain it was for him to clean the mirrors. He took out a long-handled squeegee, walked into one of the stalls, and dipped it in the toilet. Then he used it to clean the mirrors. The reaction was almost always the same. The girls stood there in shock, glared at each other and squealed, and then hurried back to their classes to tell all the other girls. Subsequently, there were no more lip prints on the mirrors.

(the best video of this story is probably this one:
https://www.youtube.com/watch?v=_DQYArmi5L0)

The second parable is a little more gruesome and, therefore, I suspect, a little less widely known. It involves harm to animals. Specifically a donkey. If you like donkeys, you might like to skip over this one (even though the ending works out for the donkey)...



One day a farmer's donkey fell down into an old abandoned well on the old homestead. The animal brayed and squealed pitifully for hours. The farmer was going crazy, because he could not figure out what to do. He and his wife hardly slept at all, as the poor creature squalled and caterwauled in agony and fear all night. The next morning, the farmer decided there was just no way to get the donkey out of the well. If he rented a backhoe to dig out the well, the walls would probably collapse, or the bucket would mangle the poor creature. He could not use a winch to pull him out, because there was no way to get the cable around the jackass without endangering his own life. Ultimately, he decided the humane thing was to put the jackass out of his misery by covering him up in the well. At least that way no other animals would succumb to the same fate as his poor jackass.

Since the farmer did not have a backhoe, he just invited all his neighbours to come over and help him. They all brought their own shovels worked together to quickly fill in the well. As soon as the donkey realised what was happening he commenced to caterwauling like nothing you have ever heard. Tears rolled down the men's faces as they slowly buried the old animal. All of a sudden, the donkey was quiet. The men kept working in silence glad that that hardest part was over, but sad because of the harsh reality of what they had all done.

After a few minutes the farmer saw something moving and was astonished at what he saw when he bent down and investigated the hole. With every shovel of dirt that hit his back, the donkey had done something smart. He had shaken it off and taken a step up. As soon as the farmer and his neighbours shovelled enough dirt on top of the animal, he would shake it off and take a step up. As the hole filled the donkey moved closer to the surface. Finally, when the hole was almost completely filled, the donkey lunged up from the well, bit the farmer so hard he almost lost consciousness, and then ran off braying and kicking and bucking in celebration of his freedom.

The original moral of the story being: every time you try to cover your ass, it always comes back to bite you.

The third parable is kind of the opposite of the donkey moral. Except, after you've read it, we might try and convince you it isn't. This time the parable involves a different farmer, Clifford, and his wife, Daisy...

Clifford and Daisy had been married for many years. Together they raised crops and cattle on some of the poorest land in the country. Life for them was never easy and it showed.

Their marriage was somewhat legendary in the region, because of their constant bickering, loud arguments, and things being thrown and broken. As mean as they seemed to be towards each other, they were always seen around town together, and they never divorced or even separated.

Neighbours could hear the most heated of their arguments from some distance away. Occasionally their yelling could be heard deep into the night. Clifford would shout, "When I die, I'll dig my way up and out of the grave and come back and haunt you for the rest of your life ol' woman!"

Neighbours avoided the odd couple as much as possible. Quite frankly, Clifford preferred people stay out of his business and to be left alone. Clifford died when he was 87.

After the burial, Daisy's neighbours, concerned for her safety, asked, "Aren't you afraid that he may indeed be able to dig his way out of the grave and haunt you for the rest of your life?" She replied, smiling, "let him dig. I had him buried upside down. And I know he's too bull-headed to stop and ask for directions."

The fourth parable is probably too short to meet the official requirements for a parable. It comes from my Dad's seemingly bottomless pit of acquired stories. Which is to say, you may already know this one too... I don't think he was so good at acquiring them from hidden places no-one had heard of.

My Dad says, 'you've been a good boy today, so I'm going to tell you something big. Something about one of life's biggest mysteries. I want you to ask me what's the secret of comedy.'

I say, 'huh?'

He repeats, 'ask me the secret of comedy.'

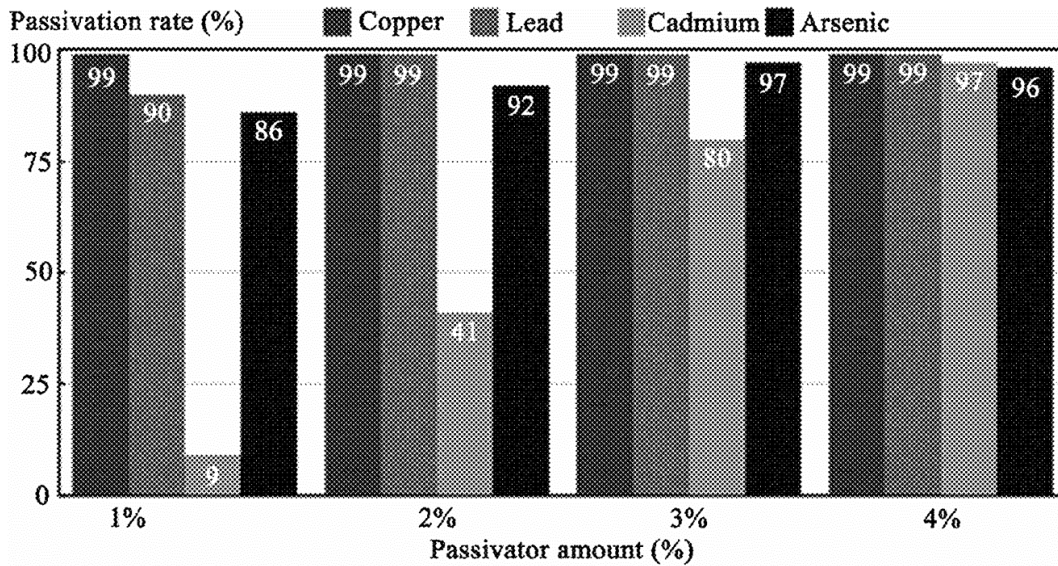
I say, 'what's the se...'

'Timing.'

So, now the \$64,000 question... what do the four parables have in common?

Okay, maybe not 64,000. Think of a smaller number. Less than or equal to 40.

Patent of the Month – Heavy Metal Removal

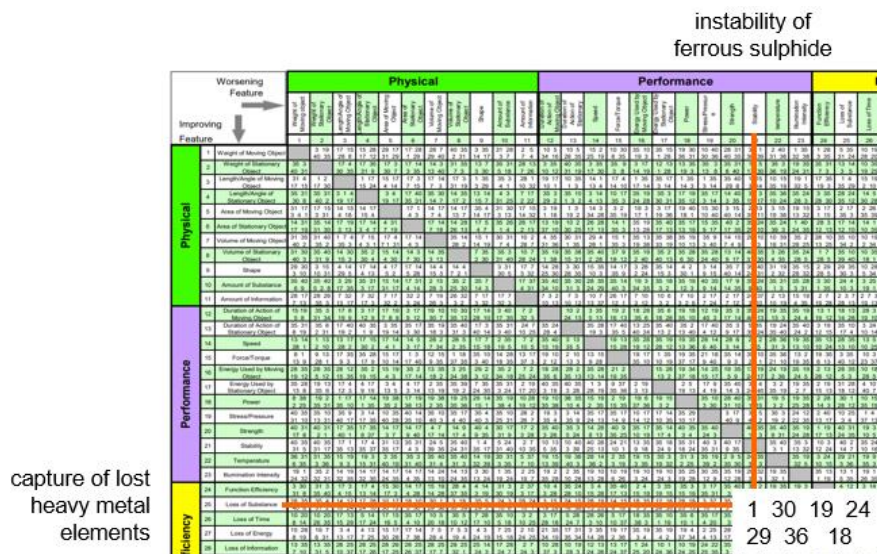


Our Patent of the Month this month takes us to China. US12,083,491 was granted to a quintet of inventors at Henan University on 10 September. Here's what the beautifully succinct background description has to say about the problem being addressed:

Heavy metals are present in the environment due to metal smelting, pesticide production, and industrial wastewater discharge, and are poisonous to all kinds of organisms. Researchers attempt to develop a method for improvement of heavy-metal-contaminated soil.

Ferrous sulfide is a potential passivator used for selectively removing certain types of heavy metals from contaminated soil. However, ferrous sulfide tends to be oxidized and has poor storage stability, which results in high rates of chemical accidents.

A clear Loss Of Substance versus Stability conflict. Which looks like this when mapped onto the Contradiction Matrix

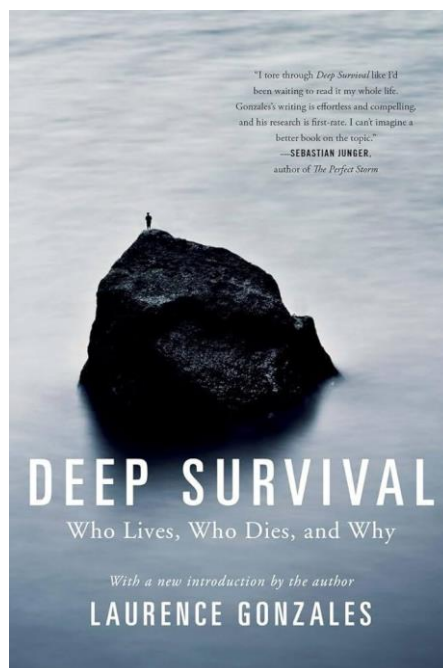


And here's how the inventors resolved the problem, as described in the main Claim of the patent:

A method, comprising: 1) [Principle 35] dissolving a sulfide in an alkaline solution to form a mixed solution with a pH of 12-13; 2) adding [Principle 24] sodium silicate to the mixed solution and stirring for 0.5-1 hour at 20-40degC.; 3) adding an aqueous solution of a ferrous salt to the mixed solution containing sodium silicate, and allowing to [Principle 36] react at 40-60degC. for 2-3 hours; where, with decrease of the pH of the mixed solution, sodium silicate is converted into silica nanoparticles [Principle 1], and the ferrous salt reacts with the sulfide to form ferrous sulfide; and 4) further adding an aqueous solution of an organic modifier to the mixed solution, and allowing to react at 40-60degC. for 1-2 hours to form a [Principle 35] passivator slurry comprising surface-modified ferrous sulfide doped with silicon dioxide; filtering the passivator slurry through suction filtration to form a filter cake passivator or spray drying the passivator slurry to form a dry powdery passivator.

Another one for the 'easy-when-you-know-how' pile.

Best of the Month – Deep Survival



Back to 2003 for this one. A classic example of a ‘someone, somewhere already solved your problem’ book, with a clear eye to the ‘think of someone with a more extreme version of your problem’ end of the someone spectrum. Most of us – fortunately – don’t find ourselves in life-threatening situations that often. Some people – Laurence Gonzales for example – starting with his WW2 bomber pilot father find themselves surrounded by such people. Deep Survival is the result of distilling all the things he discovered worked and didn’t work when it comes to how people do or don’t survive. The result is a fascinating blueprint of the psychological, emotional, and physiological traits that enable some individuals to survive extreme, life-threatening situations. The key elements of the system he describes are rooted in mindset, emotional control, and adaptability, combining both cognitive and behavioural responses to adversity. Here are the essential elements of the survival system Gonzales outlines:

1. **Stay Calm and Manage Emotions:** in emergencies, panic can be fatal because, per the lead article in this month’s ezine, our ‘instincts’ are almost by definition inconsistent with unprecedented emergency situations. Survivors manage to stay calm under pressure, controlling the emotional surge that can cloud judgment and lead to poor decisions. Simple techniques like breathing exercises can help slow down the heart rate and create mental space to think clearly.
2. **Perceive and Accept the Reality of the Situation:** survivors quickly assess and accept the situation for what it is, no matter how dire. Denial or wishing the situation were different can delay vital decisions. Being honest about the threats and limitations in a crisis situation is crucial to forming a survival plan.
3. **Stay Positive but Realistic:** survivors maintain hope but are grounded in reality. They don’t let false optimism cloud their understanding of the situation, but they also avoid despair. They focus on small, achievable goals, such as finding shelter, food, or water, which helps build momentum toward larger survival goals. They understand the need for a ‘sense of progress’ and that the Kubler-Ross Grief Cycle (Denial-Anger-Bargaining-Depression-Acceptance) is as relevant to survival situations as it is to grief. The main

difference being that in the final 'Acceptance' phase, there is a need to re-frame the mindset to one that accepts the need to continually re-invent the fight...

4. Focus on the Next Step: in a survival scenario, large, overwhelming goals are broken into smaller, manageable tasks. This helps conserve mental energy and prevents feeling overwhelmed. Each decision and action is deliberate and directed towards solving immediate problems or achieving critical objectives.

5. Adaptability and Improvisation: survivors are flexible in their thinking and able to shift plans quickly when circumstances change. They avoid becoming fixated on one course of action. Survivors use whatever materials are at hand to address immediate needs, showing creativity and resourcefulness in solving problems. They understand that planning is everything, but the plan is nothing (the Mike Tyson quote, 'everyone has a plan until they get punched on the nose' is there to tell you to expect plenty of punches).

6. Know Yourself and Your Limits: self-awareness is crucial. Survivors know their physical and mental limits and adjust their actions accordingly, avoiding overexertion or rash decisions. They avoid exhaustion by managing their energy wisely, prioritising rest and conservation of resources. They also understand that in extreme situations we are physiologically capable of record-breaking feats (e.g. lifting cars off trapped crash victims), but that they have downstream negative consequences.

7. Surrender to the Situation (Without Giving Up): survivors let go of the need to control every aspect of the situation and focus on what they can influence. This mental surrender helps to manage fear and frustration. They 'survive one moment at a time', by focusing on surviving in the present, survivors avoid becoming paralysed by the enormity of the challenge.

8. Use Group Dynamics Effectively: in group survival scenarios, effective communication, cooperation, and leadership are critical. Survivors support each other and take on roles suited to their abilities. Conflicts will arise and need to be resolved quickly: every contradiction has a win-win resolution, but the inevitable time and resource constraints present in an emergency situation may preclude such solutions. Where this impasse situation arises, survivors recognise the need to make impossibly difficult decisions... and that not everyone will necessarily survive.

9. Never Give Up (Tenacity): survivors possess an indomitable will to live, even when faced with overwhelming odds. They constantly adjust their mindset to keep pushing forward, regardless of setbacks. They are able to focus on the "why": a strong sense of purpose or reason for survival—whether it's family, personal goals, or sheer will—keeps survivors going through the worst challenges.

10. Preparation and Training: survivors often mentally prepare for emergencies, running through various scenarios in their mind before a crisis occurs. This helps them act quickly when faced with actual danger. This is about seeking to train better non-linearity instincts. Training in survival techniques, physical fitness, and stress management increases the odds of surviving in extreme conditions.

11. Trust Your Instincts: survivors often have a keen sense of intuition that guides their decisions. This instinct is honed by experience, observation, and situational awareness. Heightened awareness of the environment, dangers, and opportunities for survival helps survivors make fast, accurate decisions. This is a tricky one. Many of the cases described by Gonzales involve situations where people allowed themselves to believe they'd been in worse situations than where they currently are and so allowed hubris to take hold. These

kinds of deviation from reality cause us to forget the 'you can never step in the same river twice': your current situation is ultimately unique. Here's the biggest contradiction management challenge: experience is great, but so is recognising when it's relevant and when it isn't. Having a 'beginner's mind' helps overcome hubris, but, of course, that demands a beginner's mind that is at least equipped with some core principles of behaviour... like these eleven points rather than the individual stories and the unique contexts that accompany them.

The key elements of the survival system in Deep Survival ultimately revolve around emotional control, clear perception of reality, adaptability, and perseverance. And, even though the word is almost never used, prevailing in the midst of contradictions. Some of which will be made impossible to solve by the constraints of the situation.

Not quite the antifragility how-to book the world needs right now, but definitely a step in the right direction. And compulsively readable too.

Conference Report – ICSI'15



On the plus side, you have to admire the Taiwan-based conference organisers for their persistence in trying to spread the word about Systematic Innovation. Part of this strategy sees the annual International conference alternate between a venue in Taiwan/China and a new location, usually outside Asia. The mission looks a little bit like FIFA and their goal to spread the beautiful game of football to every corner of the world. So, anyway, the fifteenth conference found itself at the technical university in Bursa, Turkey. The above photograph probably gives a picture-speaks-a-thousand-words analysis of the success of the visit. There were four Turks in the audience. They were outnumbered 3-to-1 by attendees from Taiwan. Partly, I imagine, the consequence of scheduling the conference in the middle of Turkey's vacation season (i.e. the university had capacity to host the event), but mainly because Turks are currently living in an economy where the inflation rate is officially 60% and unofficially (i.e. actually) closer to 140%. Put simply, spending money to attend a conference on a subject you don't know you might be interested in is likely viewed by locals as something of a luxury.

On the one hand, we'd have to say that the conference was a lost opportunity to showcase TRIZ and other innovation tools to a new audience. On the other, looking at the quality – or lack thereof – of the papers being presented and it would perhaps be safer to conclude that the lack of attendees was a blessing. And if that sounds like a contradiction – we want attendees and we don't – you're probably right. If the top innovators in Turkey had turned up, I'm pretty confident they would have left thinking TRIZ was a really complicated way of creating not very good solutions to problems that, for the most part, didn't require any kind of methodology to get to a viable breakthrough solution.

For my sins, I was one of the three judges of the usual Competition to evaluate the best submitted case studies of the past twelve months. This year there were nine entries, quite a bit down on the usual number. My optimistic side hoped that the absence of quantity would be compensated by an increase in quality. Alas, I was in for a lose-lose afternoon of listening to some truly terrible problems and even worse solution proposals. My long-time kryptonite are people presenting cases where TRIZ was used after they had already decided what their non-contradiction-solving solution was going to be. My double-kryptonite is when they didn't even use TRIZ right either. These cases do not help anyone, least of all the organisers hoping to spread the word and encourage others to adopt systematic approaches.

This year's eventual winner (the low marks I awarded were obviously cancelled out by high marks from the other two judges – neither of whom, by the way, were active TRIZ or SI users) involved a fairly typical problem with burrs on a metal moulding machine tool. The proposed solution was to switch to an injection moulding process in the longer term, and to purchase an additional machine to file off the burrs in the short term. If someone asked me to describe the polar opposite of what a good TRIZ/SI case study looked like, this would very likely be the first example I would offer. Because I had to leave the conference straight after I handed in my voting card I only learned what the winner was a week or so after the conference had finished. To say I nearly fell off my chair would be an understatement. The solution I did vote top of my list (score: 41%) managed to win the silver award. The team behind this solution didn't use TRIZ either, but at least where they ended up was a valid (if too complicated) solution to a real problem.

As for the papers on show during the conference, my combined notes for the whole event amounted to slightly less than half a page. Regular readers will know that one of my main motivations for attending conferences is that they are a good way of making me angry and frustrated (usually at myself, by the way, for my failure to communicate the subject better – especially people taking ideas from some of my presentations and then twisting them around to mean the opposite of what I meant). At ICSI'15 I felt neither emotion. Simply a depressing feeling that we're somewhere close to the death knell of not just the conference specifically, but TRIZ more generally. Without wishing to get too graphic or maudlin, the image I kept seeing in my minds eye was of those abused, over-worked, under-cared-for donkeys that don't quite make it to the sanctuary.

One of my aims for this year, meanwhile, is to always try and look on the bright side. The bright side of ICSI'15 happened the day before the conference started, when I ran a one day 'AI-assisted Innovation' workshop. We didn't quite get the 100+ attendees that had signed up to the (local government sponsored) event, but we got a pretty good crowd that bulldozed through the language barrier and came up with some very good solution ideas during the exercises. And several students that came up to me afterwards asking if they could come and work for us. One or two might just get their wish.



(my usual Red-World/Green-World difference slide and me trying to make the point that today's AGI tools can do Red World but thus far have zero useful contribution to make in Green World.)



Wow In Music – A New England



Kirsty MacColl is known to many music fans as one of the most underrated British singer/songwriters to have lived. Alongside Tracey Thorn (Issue 204, March 2019), she has perhaps the definitive Generation X voice. She was largely undervalued by the British recording industry in the early 1980s but left behind four complete albums and numerous recordings worth of backing vocals & sound engineering. "A New England" was written and recorded by British singer-songwriter Billy Bragg in 1983 and released with only two verses and minimal instrumentation. The next year, MacColl recorded it with a key change and two additional verses. The song became MacColl's biggest UK charting hit, attaining a #7 spot.

The original take of the song appears on Bragg's debut record *Life's A Riot With Spy Vs Spy*, and was a bit short for MacColl. So, Billy Bragg sat in her kitchen one morning and wrote two more verses (the last two) just for her. Those verses help to bring out the deep sense of disappointment in the lyrics even further into the forefront than it is on the original. Besides that, I think the key reason that those new verses work so well is for the same reasons that the original ones do on this version; they're being sung by Kirsty MacColl.

Even from this early stage, it was understood that MacColl had a gift that not all singers have, which was an ability to know precisely what her own voice could do to serve the given source material. This version works because even in its original form, this is a song about people we've all met. In MacColl's hands, it's a song specifically about a girl we grew up with who isn't an immortal pop star diva, but rather one of us. Like ourselves, she finds herself confronted by a need to find out who she really is as she grows from one stage of her life to the next.

When Kirsty sings this character who talks about "looking for another girl" in this song, that other girl is the girl herself. This (Principle 13) changes the meaning of the original song, and makes it a statement about seeking to be the best version of oneself, and not trying to define that identity in relation to someone else. That's a powerful thing to say, and one

cunningly using the original material as a means of saying it. This is what every cover version worth anyone's time should perhaps try and achieve?

Bragg's additional lyrics meanwhile are full of inventive twists and turns. My favourite being the Principle 9 twist in the final verse:

*Once upon a time at home
I sat beside the telephone
Waiting for someone to pull me through
When at last it didn't ring, I knew it wasn't you*

Or maybe the Principle 38 'bloody' in the third verse:

*I loved the words you wrote to me
But that was bloody yesterday
I can't survive on what you send
Every time you need a friend*

Musically, the wow's are the things that make you want to keep playing the song knowing you'll never tire of hearing it: In contrast to Billy Bragg's rather sparse recording of "A New England", the vocals and instrumentation on MacColl's version soar. Produced by MacColl's ex-husband Steve Lillywhite (and reminiscent of other Lillywhite-produced bands such as U2, Big Country, Peter Gabriel, and Talking Heads of the era), the filled-out arrangement also benefits from an unusual modulation.

The chord progression of the early verses in C major is somewhat standard (I-V-iii-IV-vi-V-IV-I), but the chorus takes on a (Principle 17) non-diatonic chord upon the first utterance of the word "girl" (first heard in this video recording at :51, and upon repetitions serves as a launching point for MacColl's vocal runs) of E major.

More interestingly, after the second repetition of the chorus (heard at 1:57), the last cadence does not move from IV-I but (a different Principle 17) IV- \flat VII (F-B \flat major chords). The song doesn't stay long on B \flat , arriving at the new key of D major, with the same chord progressions as heard earlier, at 2:17. One interpretation of this harmonic movement is that this :20 of layered vocal harmonies could be considered cadential extension. The movement of IV- \flat VII (Principle 10) delays the cadence, but while you could interpret the \flat VII as replacing the V chord, it lands on the I chord of an entirely new key, a full step up. This is, as music theory commenters on the internet call it, "crunchy as hell".

After her time with Stiff Records was over and her career as a mother began, Kirsty MacColl's recording career would be characterised with her session work with other artists, from The Smiths, to Big Country, to Simple Minds, to The Pogues. But, she'd record five studio albums as a solo artist before her accidental death in 2000. In addition to being a talented interpreter, these albums would show that Kirsty MacColl was also a songwriter of tremendous depth, and with a wide range of musical curiosity.

I was lucky enough to see her live in concert three times. Always known for being a shy performer, I have particularly fond memories of seeing her in what was effectively a hastily converted cow shed just outside Portishead. If I'd been her, I'd have called the whole thing off within a few minutes of arriving up the driveway of a farm in the middle of nowhere in particular. Fortunately, the moment she hit the stage, the wave of love she received from the crammed-to-the-rafters audience made the whole night a joy. One that hit an ultra-rare hairs-on-the-back-of-the-neck-standing-up moment when she sang A New England.

Investments – Circular Economy Plastic Catalyser



A new chemical process can essentially vaporize plastics that dominate the waste stream today and turn them into hydrocarbon building blocks for new plastics.

The catalytic process, developed at the University of California, Berkeley, works equally well with the two dominant types of post-consumer plastic waste: polyethylene, the component of most single-use plastic bags; and polypropylene, the stuff of hard plastics, from microwavable dishes to luggage. It also efficiently degrades a mix of these types of plastics.

The process, if scaled up, could help bring about a circular economy for many throwaway plastics, with the plastic waste converted back into the monomers used to make polymers, thereby reducing the fossil fuels used to make new plastics. Clear plastic water bottles made of polyethylene terephthalate (PET), a polyester, were designed in the 1980s to be recycled this way. But the volume of polyester plastics is minuscule compared to that of polyethylene and polypropylene plastics, referred to as polyolefins.

"We have an enormous amount of polyethylene and polypropylene in everyday objects, from lunch bags to laundry soap bottles to milk jugs -- so much of what's around us is made of these polyolefins," said John Hartwig, a UC Berkeley professor of chemistry who led the research. "What we can now do, in principle, is take those objects and bring them back to the starting monomer by chemical reactions we've devised that cleave the typically stable carbon-carbon bonds. By doing so, we've come closer than anyone to give the same kind of circularity to polyethylene and polypropylene that you have for polyesters in water bottles."

Hartwig, graduate student Richard J. "RJ" Conk, chemical engineer Alexis Bell, who is a UC Berkeley Professor of the Graduate School, and their colleagues published the details of the catalytic process in the current issue of the journal *Science*.

Polyethylene and polypropylene plastics constitute about two-thirds of post-consumer plastic waste worldwide. About 80% ends up in landfills, is incinerated or simply tossed into the streets, often ending up as microplastics in streams and the ocean. The rest is recycled as low-value plastic, becoming decking materials, flowerpots and sporks.

To reduce this waste, researchers have been looking for ways to turn the plastics into something more valuable, such as the monomers that are polymerized to produce new plastics. This would create a circular polymer economy for plastics, reducing the need to make new plastics from petroleum, which generates greenhouse gases.

Two years ago, Hartwig and his UC Berkeley team came up with a process for breaking down polyethylene plastic bags into the monomer propylene – also called propene – that could then be reused to make polypropylene plastics. This chemical process employed three different bespoke heavy metal catalysts: one to add a carbon-carbon double bond to the polyethylene polymer and the other two to break the chain at this double bond and repeatedly snip off a carbon atom and, with ethylene, make propylene (C₃H₆) molecules until the polymer disappeared. But the catalysts were dissolved in the liquid reaction and short-lived, making it hard to recover them in an active form.

In the new process, the expensive, soluble metal catalysts have been replaced by cheaper solid ones commonly used in the chemical industry for continuous flow processes that reuse the catalyst. Continuous flow processes can be scaled up to handle large volumes of material.

Conk first experimented with these catalysts after consulting with Bell, an expert on heterogeneous catalysts, in the Department of Chemical and Biomolecular Engineering.

Synthesizing a catalyst of sodium on alumina, Conk found that it efficiently broke or cracked various kinds of polyolefin polymer chains, leaving one of the two pieces with a reactive carbon-carbon double bond at the end. A second catalyst, tungsten oxide on silica, added the carbon atom at the end of the chain to ethylene gas, which is constantly streamed through the reaction chamber to form a propylene molecule. The latter process, called olefin metathesis, leaves behind a double bond that the catalyst can access again and again until the entire chain has been converted to propylene.

The same reaction occurs with polypropylene to form a combination of propene and a hydrocarbon called isobutylene. Isobutylene is used in the chemical industry to make polymers for products ranging from footballs to cosmetics and to make high-octane gasoline additives.

Surprisingly, the tungsten catalyst was even more effective than the sodium catalyst in breaking polypropylene chains.

"You can't get much cheaper than sodium," Hartwig said. "And tungsten is an earth-abundant metal used in the chemical industry in large scale, as opposed to our ruthenium metal catalysts that were more sensitive and more expensive. This combination of tungsten oxide on silica and sodium on alumina is like taking two different types of dirt and having them together disassemble the whole polymer chain into even higher yields of propene from ethylene and a combination of propene and isobutylene from polypropylene than we did with those more complex, expensive catalysts."

One key advantage of the new catalysts is that they avoid the need to remove hydrogen to form a breakable carbon-carbon double bond in the polymer, which was a feature of the researchers' earlier process to deconstruct polyethylene. Such double bonds are an Achilles heel of a polymer, in the same way that the reactive carbon-oxygen bonds in polyester or PET make the plastic easier to recycle. Polyethylene and polypropylene don't have this Achilles heel – their long chains of single carbon bonds are very strong.

"Think of the polyolefin polymer like a string of pearls," Hartwig said. "The locks at the end prevent them from falling out. But if you clip the string in the middle, now you can remove one pearl at a time."

The two catalysts together turned a nearly equal mixture of polyethylene and polypropylene into propylene and isobutylene -- both gases at room temperature -- with an efficiency of nearly 90%. For polyethylene or polypropylene alone, the yield was even higher.

Conk added plastic additives and different types of plastics to the reaction chamber to see how the catalytic reactions were affected by contaminants. Small amounts of these impurities barely affected the conversion efficiency, but small amounts of PET and polyvinyl chloride – PVC – significantly reduced the efficiency. This may not be a problem, however, because recycling methods already separate plastics by type.

Hartwig noted that while many researchers are hoping to redesign plastics from the ground up to be easily reused, today's hard-to-recycle plastics will be a problem for decades.

"One can argue that we should do away with all polyethylene and polypropylene and use only new circular materials. But the world's not going to do that for decades and decades. Polyolefins are cheap, and they have good properties, so everybody uses them," Hartwig said. "People say if we could figure out a way to make them circular, it would be a big deal, and that's what we've done. One can begin to imagine a commercial plant that would do this."

Read more: Richard J. Conk, Jules F. Stahler, Jake X Shi, Ji Yang, Natalie G. Lefton, John N. Brunn, Alexis T. Bell, John F. Hartwig. Polyolefin waste to light olefins with ethylene and base-metal heterogeneous catalysts. *Science*, 2024; DOI: 10.1126/science.adq7316

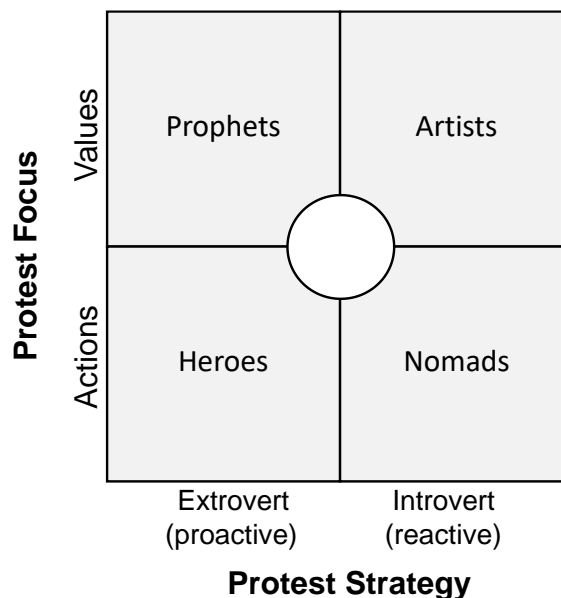
Generational Cycles – Protestors

Now they seem like scared, sappy overgrown toddlers, with their cancelling and triggering and warnings about books. Once students went to university to have their minds stretched by new ideas, but now too many appear to believe that not being challenged is some kind of human right, that university should be a 'safe space'. This is higher education as a soft-play area. In the short run, over-sensitive students may feel momentarily better about getting adults to give in to them. But they know in their heart of hearts – that greatest and smallest of unsafe spaces – that hearing different viewpoints without covering one's ears and saying 'Na-na-na-can't-hear-you!' is a vital part of being a grown-up.

...a quote from a recent article by 'outrageously outspoken' UK social commentator and prototypical Baby Boomer (Prophet), Julie Burchill, about Generation Z. Burchill started her career as a journalist covering the start of punk rock in the mid-1970s. She was 17 and in the perfect position to inflame and provoke protest.

Every generation protests, of course. It's a part of becoming an adult. Part of forming our own opinions about what we think is right and wrong about the world around us. What we protest about and how we go about doing it, however, are largely governed by the context within which we are raised: the way our parents raised us and the social and economic environment in which we found ourselves. In the former situation, our protests may take the form of a rebellion against our parents' views, or a reinforcement of the sorts of things they also rebelled against.

In the latter situation, the type and form of protest is strongly connected to where we are in generational history, and in particular which of the Four Turnings we are in when we become young adults. What we're seeing now with Generation Z (Artists) and the tsunami of mental health problems present across the cohort is typical of the pattern. Which means that we're seeing a rebellion against moral values performed in a reactive ('look what you've done to me') fashion. Here's what we think the overall four-generation protest pattern looks like:



Artists and Prophets come of age protest-wise at the tail end of a Crisis period and first half of the next societal S-curve. As we discussed in the Grey Champion article (Issue 262, January 2024), this is the period when society approaches an 'inner' crisis. Hence the protests centre around how society operates – women's liberation, civil rights, racial and gender equality and mental health.

Conversely, Heroes and Nomads protest in the second half of the s-curve, and thus the focus of protest veers towards actions rather than values – apartheid, nuclear disarmament, economic inequality and globalisation.

Artists and Nomads tend to protest reactively. The former because, having been raised as 'suffocated' youngsters matters need to get pretty bad before they realise no-one is going to protest on their behalf; the latter because they looked at the proactive Prophets that protested before them and overwhelmingly concluded that those efforts were likely more counter-productive than useful.

Whether that's true or not is largely dependent on whether the protest efforts were pointed in the right direction and how the generation in power above them reacted.

As far as we can see, there are no strong generational patterns concerning either directionality or productivity of a generation cohort's protestations. The only correlation that does stand out relates to Artist generations. One they tend to get the direction part wrong. Two – fortunately – they are the generation that tends to have the least protest impact.

Direction-wise, what TRIZ and history both tell us is that over time a) ideality goes up and b) if we're smart, resilience (antifragility) also goes up. The fact that the average lifespan of human civilisations is around 335 years tells us that as a species we're not so good at the resilience building direction.

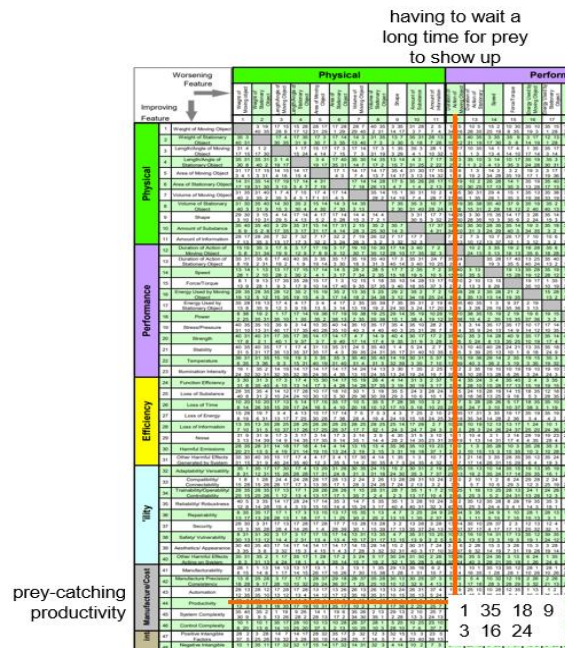
A bigger study than we're able to report here might well show that the fragility-increasing protests of Generation Z Artists right now may be a significant driver in the ultimate demise of civilisations. The combination of societal Crisis and a generation deliberately marching towards fragility is rarely a good one, irrespective of how effective the march is conducted. Bad times need strong people. Bad times make strong people. But first they need to realise that strong means realising that unpleasant truths beat feeling offended every time. Sticks and stones break bones. Words don't.

Biology – Hairy Frogfish (Antennarius striatus)



We first featured the frogfish way back in 2011 (SIEZ, Issue 109). The focus then was the fish's amazing ability to rapidly enlarge its mouth and throat to suck in adjacent prey. Now we learn that its hairy cousin has taken the story a step further. It's all well and good being able to vacuum up prey that is a few centimetres away, but how do you get prey to get that close? Or rather how long do you have to wait before prey get that close?

Here's what that problem looks like when mapped onto the Contradiction Matrix:



The hairy frogfish solution involves a wiggling (Principle 18) lure (Principle 24) – the weird worm-like appendage on the left of the photo.

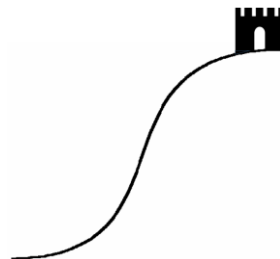
Check out this video to see the appendage in action:

<https://www.youtube.com/shorts/Db610LgyFd0?app=desktop>

Short Thort



Every system hits limits.
As meritocracy hits the top of its current s-curve,
What was good begins to reveal what's bad.
The next contradiction arrives.
The merit-laden folks that manage to climb to the top of the hierarchy
begin to shift their attention away from the merit that got them to the top
and towards developing skills that will keep them there.
They quickly realise that the easiest way to do this involves stopping others from rising.
Far easier than continuing to just stay being the best at something.
When someone or something comes along a disrupts your something,
your personal unlearning/relearning journey can be highly traumatic,
and time consuming.
More traumatic and more time consuming than for the disruptor.
So you need to change the meritocracy game.
Become the best at changing the rules to favour your merits.
Become the best at building a fortress around yourself.
A fortress that will last – hopefully – until the day you die.



News

DangerMouth

Eagle-eyed SI followers may have noticed that Season Two of our DangerMouth podcast commenced this month. The first two episodes have already received lots of positive comments. Not sure we quite fall into the categories of 'coherent' or 'focused' yet, but the journey is ongoing. Mainly thanks to a swathe of brave, coherent and focused guests... someone, somewhere already solved your problem...

AI-Driven Innovation

As hinted last month, we're planning to run an online workshop on the likely impact of AI in and around the world of innovation. Is AI going to change everything or is the innovation challenge going to send the AI world into its next Winter season? The workshop will comprise two four-hour sessions, the first on Wednesday 13 November, and the second on Wednesday 20th. The starting assumption is that participants will have a modicum of

understanding of Systematic Innovation. If it turns out that there's a need to run a pre-workshop session to for would-be participants that don't have this SI knowledge, we'll schedule that to happen on November 12. Details and bookings will be on the SI-Shop in the coming days.

3E 2025

Next year's ECSB Entrepreneurship Education Conference has just been announced. The event is being organised by Strascheg Center for Entrepreneurship (SCE) and HM Munich University of Applied Sciences. The conference theme has been announced as 'Responsible, Systemic, Democratic. New trajectories in entrepreneurship education.' It will, perhaps not surprisingly, be held in Munich. 21-23 May are the dates for your diary. The submission system is now open, and the submission deadline is December 1. We're likely to do something around the subject of Meaningful Innovation... so probably won't get accepted again.

India (Again)

Darrell's October trip to India is now full. It looks like he'll be back in country in January if anyone wants to organise something. Get in contact with him directly if you wish to explore possibilities.

New Projects

This month's new projects from around the Network:

- Energy – TRIZ Workshops
- Defence – TRIZ Workshops
- Finance – Market Assessment Project
- IT – Innovation Leadership Workshops
- FMCG – Strategic Study
- FMCG – SI Workshops
- Manufacture – Innovation Strategy Project
- Government – Innovation Capability Project
- NGO – SLT Change Project

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