Systematic Innovation

e-zine

Issue 190, January 2018

In this month's issue:

The Systematic Innovation e-zine is a monthly, subscription only, publication. Each month will feature articles and features aimed at advancing the state of the art in TRIZ and related problem solving methodologies.

Our guarantee to the subscriber is that the material featured in the e-zine will not be published elsewhere for a period of at least 6 months after a new issue is released.

Readers' comments and inputs are always welcome.
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COBRA+

Every business problem is inherently complex. And inherently needs to address intangible 'emotion' issues. Solving complex problems necessitates getting the problem back to a first principles level. The overall TRIZ, Systematic Innovation and TrenDNA processes are intended to help problem solvers do exactly that. The downside of both processes is they demand a certain learning overhead. An overhead that circumstances may mean is unacceptable. The COBRA+ process is intended to fill the gap. It too ensures problem solvers tackle the issues they're trying to address back at the first principles level. Figure 1 describes the basic steps of the process:

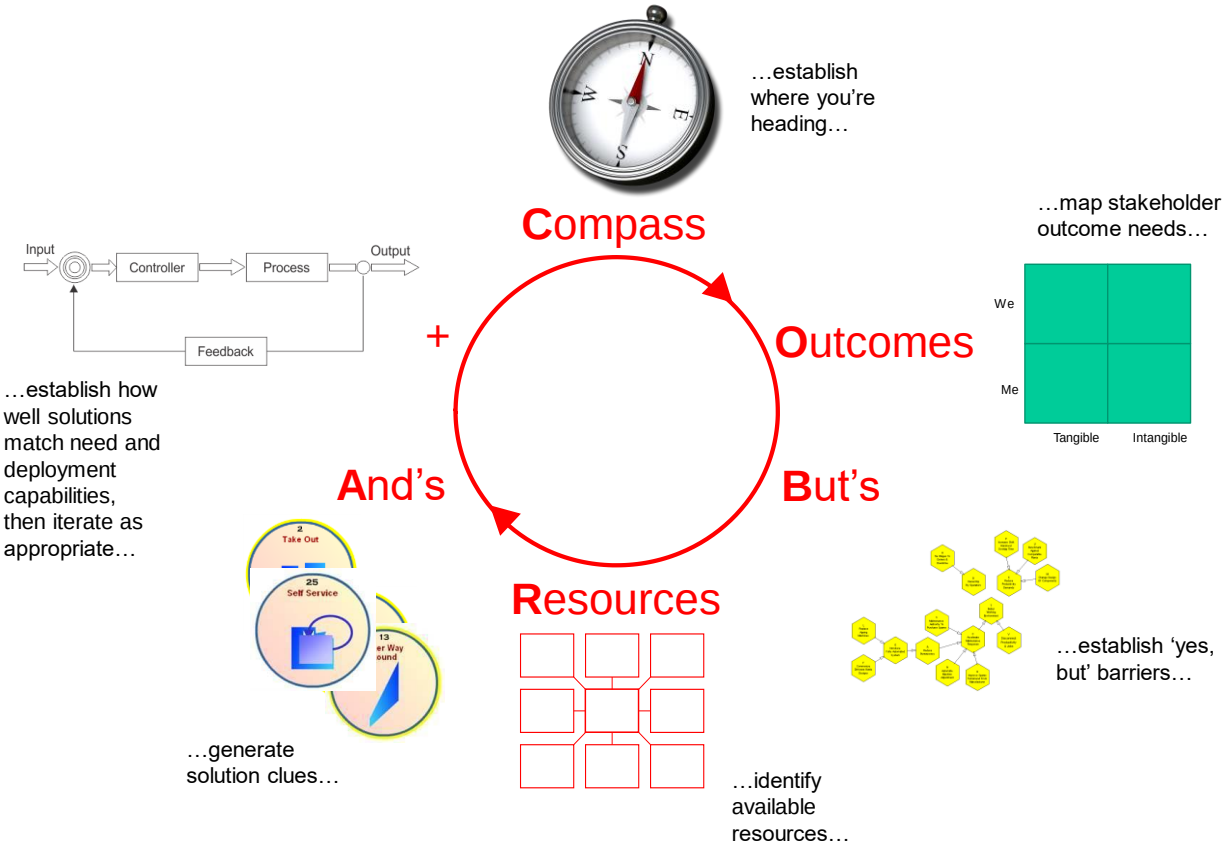


Figure 1: COBRA+ Overall Process

The process is also template-based in order to swiftly enable problem solvers to work through a logical complexity-embracing sequence of steps without a long learning curve. The overall process forms a cycle, and as such, allows a problem solver to undertake as many iterations as might be necessary to achieve an 'appropriate' solution. The test for what might be classed as 'appropriate' is contained within the process.

A first iteration around the COBRA+ cycle typically begins with C for Compass.

Compass is all about making sure we know where we're heading. Irrespective of where we think we should be heading, TRIZ tells us that all successful solutions head towards an 'Ideal' end state in which all the intended stakeholders receive all the outcomes they're looking to achieve with no negative consequences. Put into lay-person terms, every system evolves to a 'free, perfect and now' evolutionary end point. As may be expected,

this end point is more theoretical than practical. From a practical perspective it will typically entail solutions that deliver useful functions ‘by themselves’: the ideal software updates itself; the ideal team manages itself; the ideal advertisement targets itself, and so on. The usual manner of interpreting the Compass part of COBRA+ is to encourage problem solvers to think about two ‘ideal’s: one the ultimate ‘ideal’ solution, and then the other the pragmatic ‘ideal’ we wish to achieve in the current scenario.

Next up comes O. O is for Outcomes. When we’re discussing situations involving humans and we’re thinking about ‘outcomes’, we need to consider both tangible and intangible sides of the story. If we’re smart we should also think about what each of the different stakeholders present within a situation are looking to achieve, and what the people around those stakeholders are trying to achieve. Then, as if we’re not already making life difficult for ourselves as problem solvers, we also need to consider how those outcome needs alter at different stages of the story. The Fast-Moving-Consumer-Goods sector spends a lot of time thinking about ‘Moments of Truth’, critical moments when, in their case, consumers make decisions about the products being sold to them. In their world, there are basically two Moments of Truth – number one, did the consumer select their product off the supermarket shelf, and number two, when they got the product home and used it, did it work? In other industries, the number and type of Moments of Truth is likely to be rather more complex. The COBRA+ outcome-mapping job, if we’re to do it right, requires us to identify the tangible and intangible outcome needs of each of the stakeholders at each of the Moments of Truth. Taken to the first principles level, the job is easy, and we simply fill out this template:

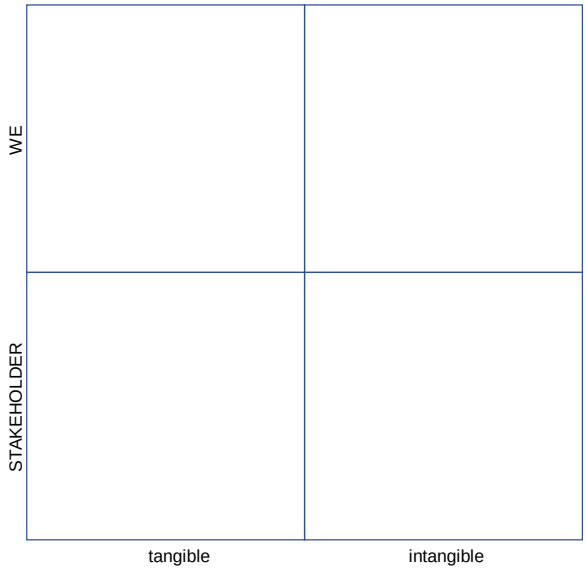


Figure 2: Outcome Map

The time-consuming part is creating one of this tables for each stakeholder at each Moment of Truth. So that we end up with something like the image reproduced in Figure 3.

Next up comes B for ‘But’. Here’s the part of the process where we deliberately force ourselves to run towards the things that will prevent us from achieving all the things we’ve identified we wish to achieve in the previous C and O stages of the process. ‘But’ is a short-cut for ‘yes, But’. Or we could call it ‘Barriers’. It’s about identifying all of the things that we perceive might prevent us from achieving a successful solution. Here’s the first part of the COBRA+ process where we explicitly start to think about complexity and complex adaptive systems. Normally (i.e. if we hadn’t accepted our business challenge

was a complex one) we would be encouraged to go and find the ‘root cause’ of our problem.

Figure 3: Outcome Landscape

Once we accept that a situation is complex, we have to accept that there is no such thing as a root-cause. The links between cause and effect in a complex system are often remote and inter-connected. The strong likelihood is that the outcomes our system currently delivers are emergent and that what they emerge from is a ‘conspiracy of causes’. Once we’ve identified each of the ‘yes, but’s’ preventing us from achieving the outcomes we want (versus the ones we might currently be getting), the heart of the ‘B’ stage of COBRA+ involves us mapping the relationships between each of the ‘yes, but’ statements we’ve been able to identify. Here’s another important feature of complex systems: it’s not so much the things that determine the behaviour of the system as it is the relationships *between* the things. The way the process works here is we map the ‘betweens’ by asking the question ‘which of the other ‘yes, but’ perception statements does this one lead to?’ We need to answer this question for each of the ‘yes, but’ perceptions we’ve been able to list. Then we can draw a map of what we’ve done. The map should end up looking something like this:

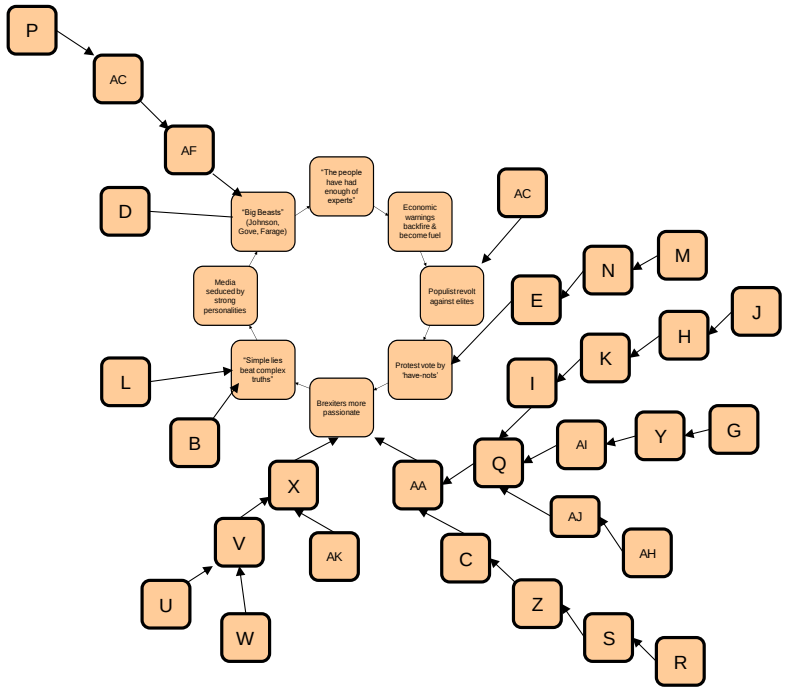


Figure 4: Typical Perception Map

...which can appear a little intimidating at first (although this particular map is for a somewhat more complex problem than most). What will inevitably appear, however, is at least one loop. And because the map has been constructed based on a list of 'yes, but' statements, those loops (actually only one in this example – in other situations, there may be more) will define the vicious cycle (or cycles) that are preventing us from achieving our desired outcomes. At this point we have found something important: the critical part or parts of the 'conspiracy of causes' that will prevent us from getting to where we need to be. Actually, we've also identified something else that may turn out to be important. Looking at the above map, notice the box 'Q' which has multiple arrows pointing to it. This is what we call a 'Collector'. It is one of the important things 'driving' the vicious cycle. If we combine the idea of loops and collectors, we can also notice that the boxes labelled 'simple truths beat complex lies', 'Brexiteers more passionate' and 'Big Beasts' are not only in the vicious cycle loop, but they're also Collectors. This is trying to tell us that, as we transition from problem definition to solution generation, these are the most important areas for us to focus our attention on. In a complex situation, everything is, of course, connected to everything else, but nevertheless, when we're looking to change the system (hopefully for the better), we need to start somewhere. This 'yes, but' map is designed to navigate us to those places.

We still haven't solved anything at this stage in the process, but we do now know what the important problems are, so we can begin the transition to solution. This brings us to the R part of COBRA+. R stands for Resources. The job in this part of the process, then, is to make a search for anything (knowledge, things, processes, people, measures, etc) that is either in or around our current system that we might be able to bring to bear to help us to improve the system. In theory, this is the simplest part of the process. In practice it can often require us to do some deep thinking about what we already have that we might not recognise we have. The best heuristic to keep in mind when making this search for Resources is that any time we allow ourselves to add something new to a system, we've just made it worse. In that we've taken it further away from the 'Ideal' we identified in the C-stage of COBRA+. Here's another heuristic: 99 times out of a hundred, the resources needed to solve the problem are already there in or around our system, they just haven't been recognised as resources. Or – important point – they have been things that we've viewed as harmful things rather than things that will help us to get to where we want to be. Lack of money, competitors and the person that arrives at meetings apparently intent on disrupting everyone are all things that are easily classifiable as negative things, but as far as our search for Resources is concerned, they're also likely to be some of the best opportunities we will have to solve our problem.

Now we arrive at A for 'And'. This is the part of COBRA+ where we do all of the heavy-lifting in terms of solution generation. There are numerous way to do this idea generation job. The simplest, now the C, O and, particularly, B stages have told us where we're trying to get to and what's stopping us, is to simply brainstorm solution ideas. The next simplest is to look to the world of TRIZ and this book and make use of the 40 Inventive Principles. The most effective way is to make use of the Business Matrix since it will allow us to prioritise which of the 40 Principles to use. The 'And' process, therefore, makes use of the Conflict Abstraction Template (CAT) – Figure 5. The way we start the job of using this template is to equate the 'thing we're trying to improve' box at the top left of the picture to our Compass 'ideally' statement. And the thing stopping us are the most important of the 'yes, but' perceptions as defined by the 'yes, but' map from the 'B' stage of the process. Once we've translated this 'specific problem' into the generic improving and worsening parameters offered down the sides and across the top of the Matrix, we can start looking up the relevant Inventive Principles at the intersections between the relevant rows and

columns. Then, when we have these Principles, we can begin generating a list of ‘And’ solution clues. In true TRIZ (and Design Thinking ‘divergence’) fashion, our target here is to generate as many solution clues as possible.

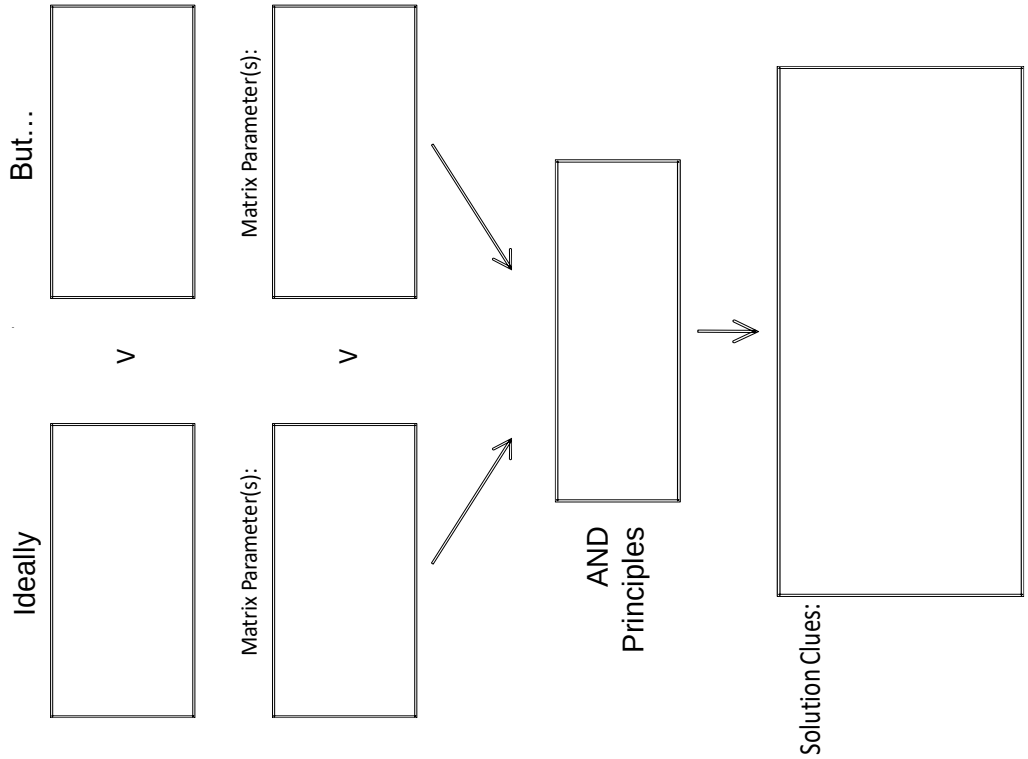


Figure 5: Conflict Abstract Template (CAT)

The SI team in-house heuristic is ‘diverge until it hurts’. As a minimum, we force ourselves to generate at least five clues from each of the offered Inventive Principles. If we’re feeling particularly motivated, the five will become ten. Or twenty. There’s rarely a downside to generating ‘too many’ ideas. Forcing ourselves to generate lots of ideas forces us to put aside consideration of the quality of those ideas and to get ‘out of the box’ and start thinking about more radical solution directions. The ultimate idea being that, once we start the process of converging on the solutions we might actually consider taking forwards, we will be looking at combinations of the solution clues we’ve generated. A radical clue on its own is rarely going to give us a ‘silver bullet’ solution, but a radical clue in combination with some of the other clues, is very likely to give us the breakthrough we’re looking for. The ‘And’ process is largely a divergent one, but after we’ve ‘diverged ‘til it hurt’, there’s a need to start doing the convergent job of identifying the solution clues (and combinations thereof) that will give us a first insight into how we’re going to solve our problem.

This, finally, takes us to the ‘+’ stage of COBRA+. This is the place we close the loop back to the initial Compass heading we defined. It is all about examining the appropriateness of the insights and solutions that have emerged from the ‘And’ solution generation stage. ‘+’ is all about the comparison of where we trying to get to versus where our new solution has got us. It’s the place where we decide whether we need to go through the whole COBRA process another time, or whether the solutions we have are ‘good enough’. There are a number of criteria that ‘+’ expects problem solvers to examine in order to make the decision about whether we’re finished or whether we need to do more work. The typical ‘+’ questions are:

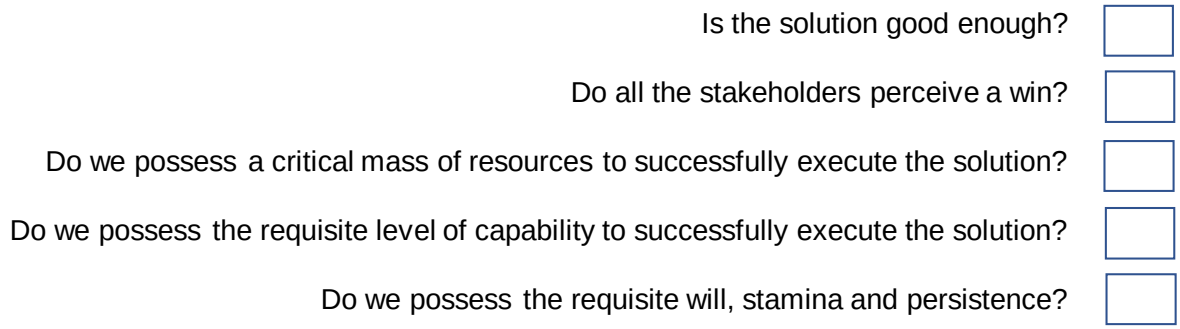


Figure 6: Typical '+' Stage Loop-Closing Questions

If the answer to any of them is 'no', then we really ought to go back to 'C' and conduct another iteration, either refining our initial Compass heading, or re-defining the problem in terms of where we are experiencing our 'no'. A likely scenario for example, is that we enter the '+' stage of the process with a solution that we think is the best thing we've ever dreamed up in our lives, but, unfortunately, when we are forced to think about the question, 'do we possess a critical mass of resources to successfully execute the solution?' we realise we do not. Now the new problem is either a new Compass heading that focuses on how we might acquire that critical mass of resources, or how we rethink our beautiful solution such that it is achievable with our existing resources.

If we're operating in true Design Thinking mode, there is no limit to how many times we might find ourselves looping around this COBRA+ process. In reality, what we're doing is very brain-intensive and therefore energy-sapping. The heuristic in the SI team when we're working on real problems is 'go around the loop once and get a 'good' solution; force yourself to go around a second time and you get a 'great' solution'. Ultimately, it all depends on how much time and energy you have, recognising too, that in a complex environment, you can't 'know' what the right solution is until you've tested it with your full spectrum of stakeholders. And, again in Design-Thinking and 'minimum viable demonstration' modes, you're looking to do that as soon as you possibly can. I.e. the stakeholders are the ultimate arbiters of the first '+' question of 'is the solution good enough?' and they can only meaningfully answer that question when we've given them something to play with.

As with many things in life, it is often easier to grasp a process by seeing a tangible example rather than by reading abstract theory. The first place you'll find that is in the forthcoming Business Matrix 3.0 book, where COBRA+ plays quite a big role in the context of complex business problems.

Start With Converge?

Things are always at their most interesting when we find contradictions. We've spent quite a bit of time trialling our COBRA+ process last year. We didn't think about it at the time, but the first step in the process – C for Compass – is all about helping companies to think about the Ideal Final Result for the problem they're working on. This is by definition a convergent job. It is so because the IFR solution is by definition a point such that, the closer we get to it, the fewer and fewer solution options become available to us.

Design Thinking on the other hand typically begins with a divergent stage which encourages problem solvers to empathise with their intended customers.

Which is right? Should we start with convergence or divergence? There's the contradiction. And because we can see it is a contradiction, we also know that any question demanding to know which is right is the wrong question. In the ideal world we want the best of both worlds: We want convergence *and* we want divergence.

Both COBRA+ and Design-Thinking have at their core the idea of divergent-convergent cycles like this:

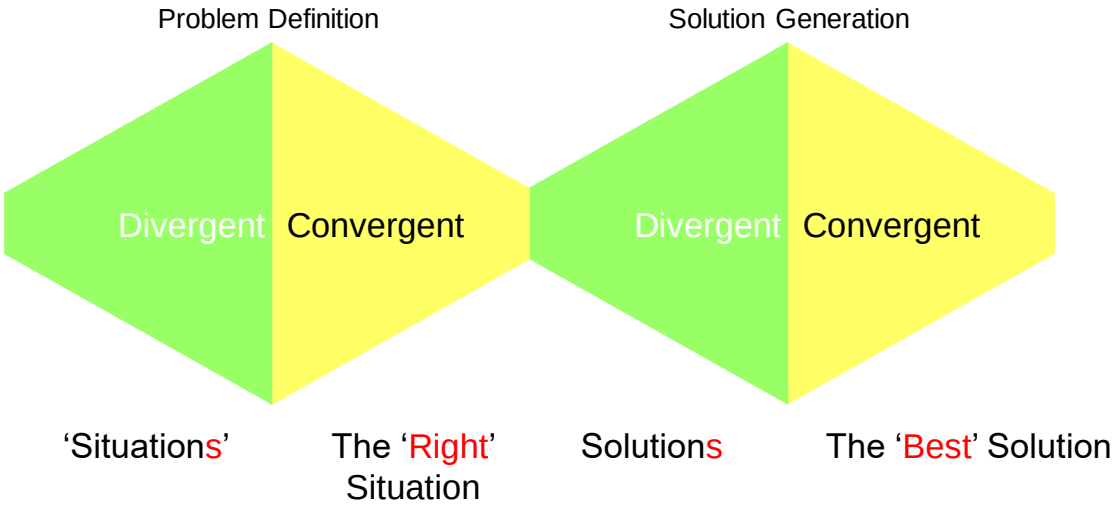


Figure 1: 'Double-Diamond' Generic Problem Definition/Solution Process

This should tell us that we should typically be looking to solve the divergent-or-convergent contradiction using a separation in time strategy: such that in a typical workshop session one follows chronologically after the other. But that doesn't appear to solve the COBRA+ versus Design-Thinking contradiction. If anything, the divergent-convergent 'double-diamond' process flow would appear to suggest that Design Thinking has the story right. The Empathise stage being an inherently divergent process of exploring what it is that customers might want us to solve.

One of the big problems of Design-Thinking is that neither its originators nor proponents know anything about TRIZ. Consequently, they know nothing about the idea of an inevitable Ideal Final Result end point or the predictable trends that lead to it.

It is often difficult for newcomers to conceptualise such things. This is one of the unsolved contradictions of the TRIZ world. Fortunately, there are successful business leaders –

people that others will listen to – that, even though they don't know TRIZ, know there are some inherent truths about the way successful things evolve. Here is an excerpt from an interview with Amazon boss Jeff Bezos where the interviewer was trying to gain some insight into the success of the Company (Reference 1):

"…Jeff Bezos is often asked, "What's going to change in the next 10 years?" That's actually *not* the key question though. Listen to how he reframes it:

"That is a very interesting question; it's a very common one. I almost never get the question: 'What's NOT going to change in the next 10 years?' And I submit to you that that second question is actually the more important of the two—because you can build a business strategy around the things that are stable in time."

"He then goes on to explain how Amazon has profited from focusing on the second question:

[I]n our retail business, we know that customers want low prices, and I know that's going to be true 10 years from now. They want fast delivery; they want vast selection. It's impossible to imagine a future 10 years from now where a customer comes up and says, 'Jeff, I love Amazon; I just wish the prices were a little higher,' [or] 'I love Amazon; I just wish you'd deliver a little more slowly.' Impossible.
And so the effort we put into those things, spinning those things up, we know the energy we put into it today will still be paying off dividends for our customers 10 years from now. When you have something that you know is true, even over the long term, you can afford to put a lot of energy into it."

To the best of my knowledge, Jeff Bezos has never heard of either TRIZ or Ideal Final Result, but he clearly understands the idea that 'what remains stable' is the customers desire for cheaper, better, faster solutions. IFR tells us everything evolves to 'free, perfect and now'; Bezos observes that the route to that end point is necessarily involves getting cheaper, better and faster.

So, anyway, back to the Design-Thinking versus COBRA+ contradiction. COBRA+ starts with the convergent 'Ideal' job because we know that successful evolution must, as Jeff Bezos's question 'what will be stable in the long term?' tells us lay in this direction. COBRA+ says that if we don't set our initial compass in this direction, irrespective of what customers might tell us when we try and Empathise with them, we're going to fail.

The second stage of COBRA+ is 'O' for Outcomes. This is where the process asks us to do the customer empathy job. It also says, partly contrary to Design-Thinking convention, that very often the best way to empathise with the customer is to not engage with them directly, but rather to think about what outcomes they're looking to achieve. This is especially the case when it comes to the intangible 'emotional' factors that ultimate determine customer behaviour. Whether in Design-Thinking mode or in COBRA+ this Empathising job is a fundamentally exploratory divergent activity in the 'problem definition' side of the double-diamond.

So how does the 'start with convergent' premise of COBRA+ fit with this divergent second stage of the process?

Answer: something like this:

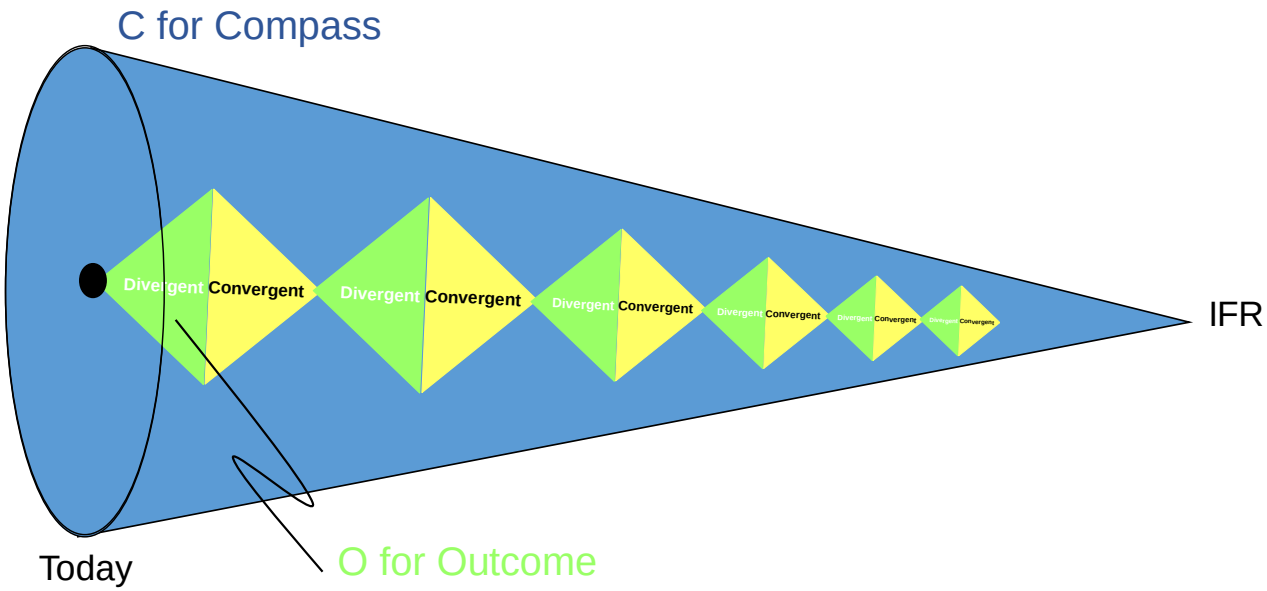


Figure 2: 'Double-Diamonds' And Evolution To Ideal Final Result

The first 'C' stage is all about defining the big evolution-to-IFR cone, and then the 'O' step (or the first stage of Design Thinking) is all about a divergent activity within this overall cone. Ergo, contradiction solved: I start with convergent in order to get the super-system level story right; I start with divergent in order to get the system-level story right.

Reference

1) https://medium.com/the-mission/be-prepared-to-lose-your-job-in-the-future-if-you-dont-learn-this-one-skill-now-8a87ade2a268

Worst Of 2017 Awards

Finding bad things to write about increasingly feels like shooting large fish in small barrels with large Howitzers. That said, 2017 felt a bit like a year of flux. The focus of the rubbishness is shifting. Customer service seems to be getting better and fewer truly awful patent applications are making it through the system. That's one side of the equation. On the other, it's been a bit of a humdinger of a year as far as new product screw-ups from companies who really should know better, and advertising messaging that comes across as increasingly desperate. Or deluded.

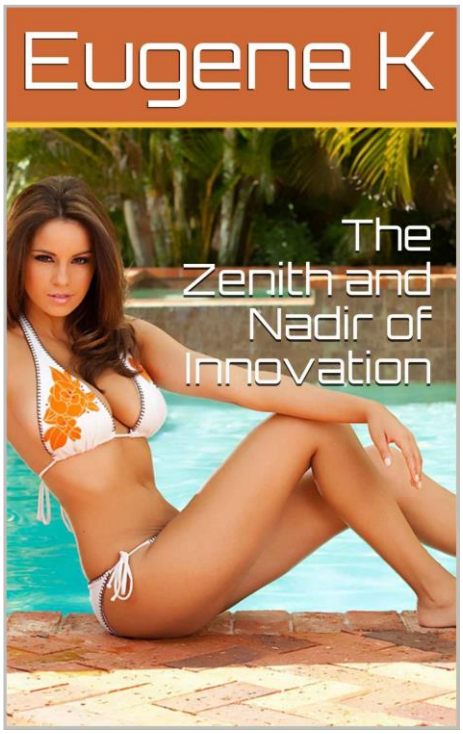
All that said, we've still managed to find winners in each of our five categories. Starting with…

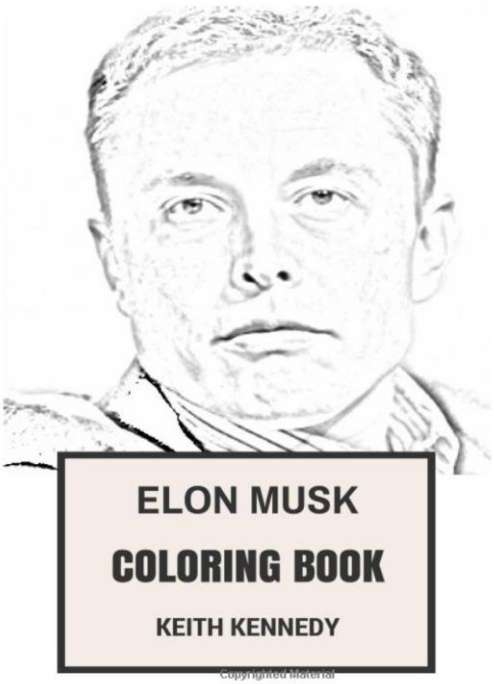
Joint 'It-Can't-Be-KLM-Again Suck'y-Airline Of The Year' and 'All-Conversations-May-Be-Recorded-For-Training-Purposes Customer Service' Awards – now, if there was any justice in the world, I'd be looking to give this award to ParcelForce this year. And specifically our local ParcelForce delivery person, who, despite all of my attempts to ensure that any deliveries of necessary guitars this year were timed to coincide with the absence of my better half, nevertheless conspired to tell her after the event whenever it happened. So much for client confidentiality and guitar purchases being on a 'need to know' basis. In the end, the only reason I can't bring myself to give him the Award is that I can' be entirely sure my better half hasn't paid him to inform on me more than I've paid him to keep quiet.

So, if not ParcelForce, who to give the service award to? I was struggling for a long time to even think of candidates. No flights on EasyJet, WizzAir, KLM or Air France in 2017 so that clearly helped. And then not too many more than zero on British Airways, so that also helped now they're attempting to cut any corner pertaining to human dignity they can think of. In the end it took until two days after we set up a new URL in early December before I knew what the answer was. Drum roll, please. The winners of the 2017 Service Award goes to every single Website Design company and SEO optimization service provider on the planet. I say 'all' because that's precisely how many emailed me, phoned me, tried to contact me through LinkedIn, jumped in front of my car, etc, as soon as they got wind of my precious new URL. The volume of contacts made hit the level of 'surreal' within the week. No amount of swearing down the phone could shake them. Every website designer on the planet, we concluded, must currently be unemployed. That can't be a good thing. But cold-calling prospective clients is way worse. Meanwhile, because we have a policy of never working with anyone that cold-calls us, and that every web-service company has now one precisely that, I guess we're stuck with our bad websites for some time to come. No worries. I tell clients we're too busy to fix them. What I didn't say is what we're too busy doing is fending off cold-calls from idiots.

The Depeche Mode Everything-Counts-In-Large-Amounts Literature Award – a couple of trends need commenting upon this year. The first is the exponential rate at which the quality of 'ebook only' is descending. The cost of production of such books being effectively zero other than the amount of time author's have to invest in assembling the requisite number of words to justify in their minds calling it a 'book', the amount of damping in the publishing system is effectively zero. Which means there is no quality control mechanism at all. Anything goes. We promised a few years ago to not review such 'books' because the likelihood of finding something useful was already diminishingly small

back at the beginning of the decade. Now we can go a step further and share the joke about just how bad things can get. Here are the two 2017 ebook literature award winners:

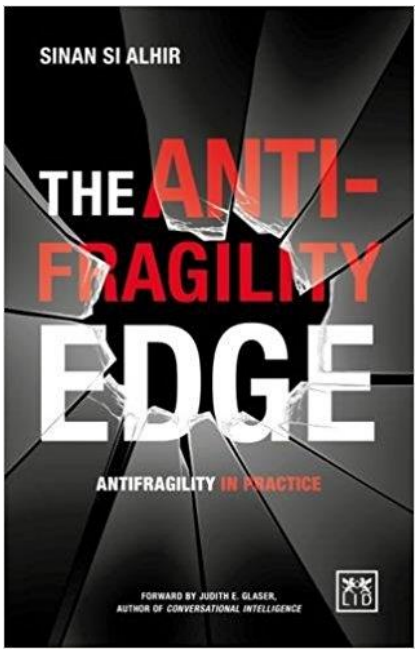


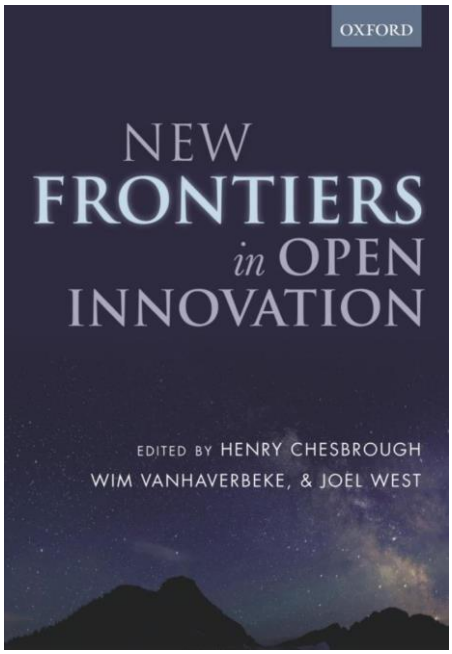


Who thought that sex didn't sell anymore? Elon Musk coloring books. Genius. Not to mention the thought that if you've got absolutely nothing meaningful to say about innovation – nadir indeed – the easy way out these days is to remember that innovators are suckers for photos of attractive women sitting by the side of the author gene pool. Shallow end.

The second trend is perhaps the more sinister: the increasing reluctance of reviewers to say anything negative about any book. Part of this phenomenon stems, I'm sure, from the 'play nice' meme – if you don't have anything nice to say about something, best stay quiet. I kind of get it, but it does come with an enormous downside. Almost everyone of the 4000+ innovation-related titles published in 2017 comes with a review average of 4.5 stars. Most get five stars. Not because they're five-star books (nothing that came out in the year, as far as we can tell, merited such a rating), but because they're reviews written by five-star friends, acquaintances and sycophants. The reviews themselves might just as well not exist because they don't offer any meaningful insight to anyone that might trouble to open them. Which means that your next innovation literature purchase might just as well be informed by rolling dice.

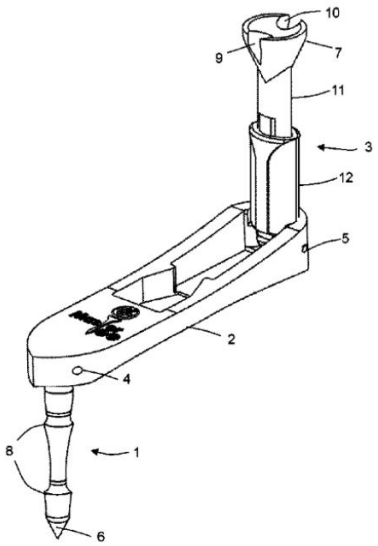
That aside, since the beginning of the year, there was only ever going to be one winner of this year's literature award. The AntiFragility Edge by Sinan Si Alhir provoked me to write my first ever Amazon review in order to try and warn people away from what I thought back then, and still think now, is the worst, most damaging piece of 'literature' of all time. As it happens, come September, the latest Henry Chesbrough 'Open Innovation' garbage ran it close. 'New Frontiers in Open Innovation' is all about how, despite having created a dysfunctional innovation monster, Henry Chesbrough continues running around in circles to try and work out why the whole idea doesn't work. As it happens the 'new frontiers' are the same as the old frontiers'. Unless you count the small army of Chesbrough consultant-apologists whose job in life seems to be mopping the blood off the walls of the latest mis-match between naïve solution provider and corporate-NIH-problem-owner.



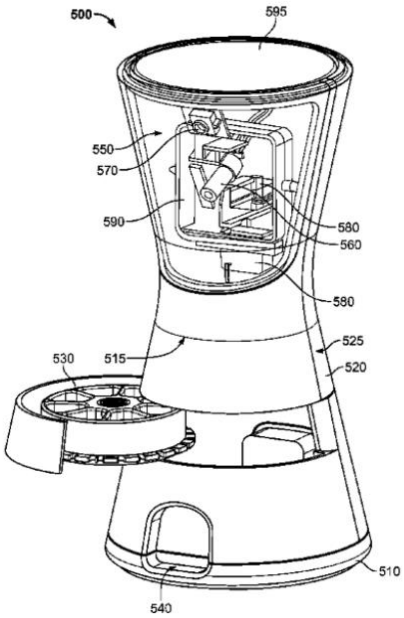


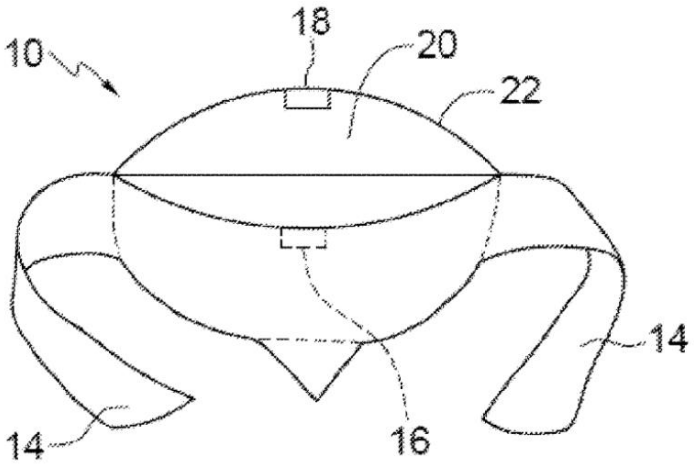
In the end though, Si Alhir's tome and good sense prevailed, and he takes the Worst of the Year award by a five-furlong margin. Actually, the funniest part of the whole story is the rebuttal he sent following my review. The fact that it took him ten months to compile his response is probably as telling as it is funny. There's nothing I can hope to do here to compete with his level of delusion, and so the best I can offer is to direct ezine readers to his story, where he very kindly also provides all of the necessary links to the things I wrote so you can revel in the whole story. Here's the place to go: https://lnkd.in/eu8cgWm. I especially love the convoluted logic of the 'if you're too fragile, please don't buy my book' climax. I'm guessing his main worry is medical claims from people splitting their sides. January 2018 and I'm still laughing.

The Necessity-Is-Not-Always-The-Mother Invention Award – golf and pets continue to be the sweetspot zones when it comes to deluded inventors. US9,833,672, 'foldable golf tee' is probably the patent that made me laugh the most. Mainly because I can't imagine ever overhearing golfers complaining about the amount of space their tees are taking up in the golf bag. But then, it turns out the punch-line doesn't arrive until you look at the drawings and realise that, in its folded-position, the new tee design is about double the size of a non-folding tee.



Beyond that, we found ourselves debating the relative merits of US9,848,578 (‘Toy and app for remotely viewing and playing with a pet’ – left hand picture) and US9,826,718 (‘pet collar with collapsible bowl’ – right hand picture)… before concluding that it was impossible to determine whether the pet or the owner would go nuts first in either case.

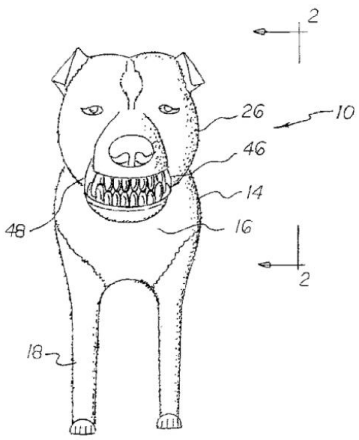


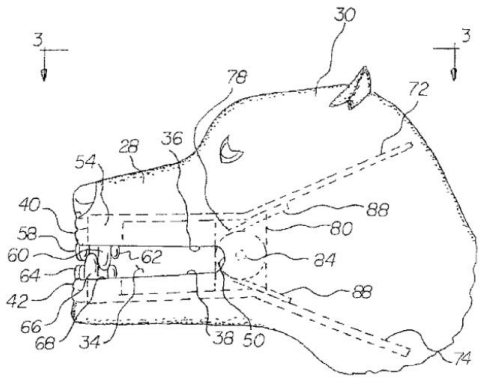


In the end neither felt like it deserved the Award. Which, finally, then, brings us to this year’s winner, US9,636,593, ‘Jawbone Doll System, which was granted to lone inventor, David A. Dexter on May 2. It may just be the most surreal invention we’ve ever encountered. The tone is set quit elegantly in the abstract:

A doll is in a configuration to simulate a pet. The doll has a mouth with an opening with upper, lower, front and side edges. The upper and lower edges are in a U-shaped configuration. A clasp has an upper component with upper teeth and a lower component with lower teeth. A clasp has upper and lower handles. The upper handle is formed as an extension of the upper component and the lower handle formed as an extension of the lower component. The handles are located in the doll and diverge to form an angle. The upper and lower components are essentially parallel while the system is at rest with the upper and lower teeth in contact. The clasp has a hinge. The hinge pivotally couples the upper and lower components. Coil springs urge the handles away from each other while urging the components and teeth toward each other.

Nope. I don’t understand it either. And then the pictures don’t help either…





It's a pit-bull. Well known focus for kid's dolls. Other variants include alligators and sharks. Err, maybe they're not supposed to be for kids afterall? The 'field of invention' section doesn't help clarify the rationale either: 'The present invention relates to a jawbone doll system and more particularly pertains to grasping and releasably holding objects in a safe, convenient, and economical manner.' I'm not sure whether this means the doll holds the child, or the other way around. Either way, those pit-bull jaws don't convey exactly what I interpret from the 'safe, convenient and economical' intent.

Then we get to the rest of the invention disclosure text. Which I've read about twenty times now and still have no idea what's really going on. For the full effect, readers need to look at the whole text. Here's just a taster in case you need more convincing. Of its kind, I'd say it is an absolute masterpiece…

In view of the disadvantages inherent in the known types of clasp systems of known designs and configurations now present in the prior art, the present invention provides an improved jawbone doll system. As such, the general purpose of the present invention, which will be described subsequently in greater detail, is to provide a new and improved jawbone doll system which has all the advantages of the prior art and none of the disadvantages.

To attain this, the present invention essentially comprises a jawbone doll system. First provided is a doll. The doll is fabricated of a pliable material. The doll is provided in a configuration to simulate a pet dog. The doll has a body. The body has four depending legs. The body has a rear. The rear has a tail. The body has a front. The front has a head. The head has a muzzle. The muzzle is provided forwardly. The head has a base. The base is provided rearwardly.

A mouth is provided. The mouth is provided in the muzzle of the doll. The mouth has an opening. The opening has an upper edge. The opening has a parallel lower edge. Each edge is in a generally U-shaped configuration. The opening has a broadly curved front edge. The front edge is provided forwardly. The opening has side edges. The side edges extend rearwardly from the front edge. C-shaped connectors are provided. The C-shaped connectors join the upper and lower edges remote from the front edges. The side edges diverge rearwardly. In this manner an angle of between 5 and 20 degrees is formed. The side edges have essentially equal lengths. The front edges have an essentially equal length. The length of the front edges is between 25 and 75 percent of the length of the side edges.

Provided next is a clasp. The clasp has an upper component. The clasp has a similarly configured lower component. The lower component extends forwardly. The upper component has integrally formed downwardly extending upper teeth. The lower component has upwardly extending integrally formed lower teeth. The upper teeth include short teeth. The short teeth are of an essentially common size. The short teeth are provided along the lower front edge and in the side edges. The lower teeth also include larger longer teeth. The longer teeth are provided at juncture of the front edge and side edges. The lower teeth include short teeth. The short teeth are of an essentially common size. The short teeth are provided along the lower front edge and in the side edges. The lower teeth include larger longer teeth. The longer teeth are provided at the juncture of the front edge and side edges. The longer teeth of the upper and lower components are adapted to contact each other in overlapping relationship. The longer teeth are further adapted to hold the smaller teeth of the upper component in closely spaced proximity to the smaller teeth of the lower component.

The clasp has handles. The handles extend rearwardly. The handles include an upper handle with laterally spaced legs. The upper handle is formed as an extension of the upper component. The handles include a lower handle with laterally spaced legs. The lower handle is formed as an extension of the lower component. The handles are located in the base of the head of the doll. The upper and lower handles diverge equally and oppositely. The upper and lower handles further form an angle of between 20 and 40 degrees. The upper and lower components are essentially parallel when the system is at rest with the upper and lower teeth in contact.

The clasp has a hinge. The hinge pivotally couples the upper component and handle with the lower component and handle. The hinge has laterally spaced upper plates. The upper plates extend downwardly from the upper component and handle. The hinge has laterally spaced lower plates. The lower plates extend upwardly from the lower component and handle. The hinge has pivot pins. The pivot pins couple the upper plates with the lower plates. The hinge also includes coil springs. The center of curvature of the hinge is provided at the pivot pins. The hinge has fingers. The fingers contact the handles. The fingers further urge the handles away from each other while urging the components and teeth toward each other. The handles are adapted to be squeezed together by a user through the application of pressure to the head base from above and from below. In this manner the upper teeth and lower teeth are separated. Also in this manner any object may be received between the upper and lower teeth. Further in this manner the system may be attached to an object between the upper and lower teeth upon the release of pressure from the handles.

Simple when you know how. Or something like that.

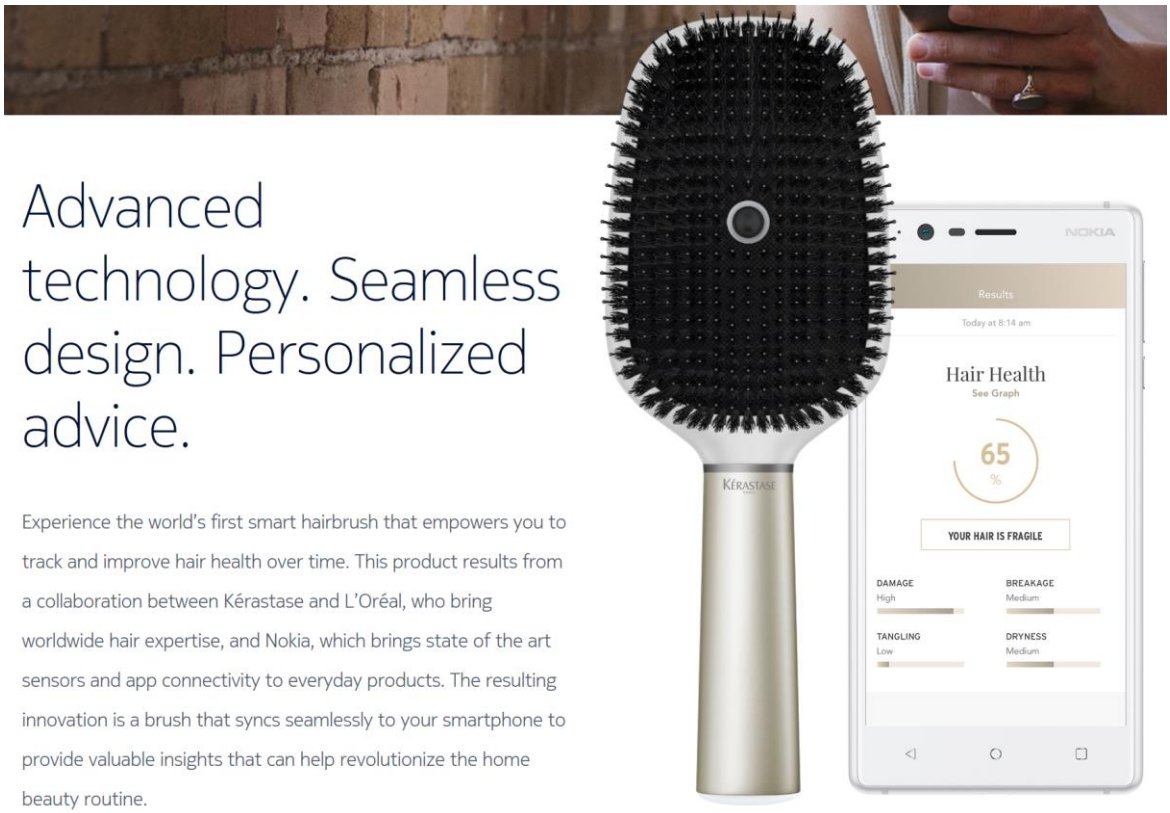
The Slow-Fast-Moving-Consumer-Goods Design Excellence Award – 2017 was definitely a bad year for the big tech companies. Samsung managed to achieve two monumentally embarrassing failures, first with the Galaxy Note 7, which it looks like will have cost the company over $5B when the flames are finally put out. Then there was their Bixby personal digital assistant, which, if you were English speaking managed to not understand pretty much anything you said to it. Eventually, the company offered users a special download app that finally allowed customers to disable the stupid thing. Former giant, Kodak, didn't do much better when it launched its Ektra smartphone. The Ektra hit U.S. store shelves in May, to the sound of crickets. Who needs another smartphone option? Especially one with mediocre specs, low rent "faux leather" plastic construction, poor battery life and a massive camera bump to house a 21MP shooter that fails in its job to take great photos. Reviews note poor color reproduction, bad low light performance and autofocus that more often than not fails to work. On its face, it was a pretty bad idea. But at $445 a pop, its fate was sealed in under a fortnight.

Meanwhile, our two joint second-prize winners for worst product introductions of the year are both pioneers in the shady world of the Internet Of Things. First up, enter the 'Smile Mirror'. Based upon conversations I've had with multiple women, one of the most obnoxious things that men do on a regular basis is order them to "smile" as if they (the women) have some obligation to look sweet. Similarly, in business, one of the most horrible management fads of all time is the insistence that employees smile while they work, even if they don't have customer-facing jobs. Very creepy. Here's the thing: forced smiles aren't smiles, they're grimaces. And a mirror that forces you to smile before functioning is a recipe for your face freezing into a staring, unnatural rictus grin. The 'smile mirror' is, according to its designer, a 'concept'. Which should increasingly be translated into design language as 'dumb-horseshit I dreamt-up when I was supposed to be working'.

On the plus side, speaking as someone who, simultaneously, would willingly spend the whole year without having to look into a mirror, and never have to smile, I guess you could say the Smile Mirror is some kind of super-innovation. Assuming it's free.

Second-up comes another former great name in the tech world, 'Nokia'. Or, actually, a collaboration between Nokia, L'Oreal and 'hair geeks' Kerastase. 'Why doesn't my hairbrush come with an app?' was obviously a question bothering lots of us for a long time. Now, thanks to Nokia, we know the answer: its because putting a number to how bad a bad-hair-day you're having doesn't add anything to anything. I refuse to go to work if my tangling score passes 67% again.

The smart hairbrush offers up a clear demonstration of what we get when designers spend their time fiddling around with technology instead of thinking about customer needs. But, at the end of the day, what the paying public got exposed to was $200 worth of hair-brushing 'advice' about how to brush their hair more effectively. No-one got hurt.



Unlike at Yves Saint Laurent. Who, in past years have demonstrated they know how to make a good pair of shoes. For Anthony Vaccarello's first season at the helm of the Parisian house he made a pair of stilettos with "YSL" as the heel, and who can forget his glittering shrug boots from the AW17 collection? They've already been worn by Rihanna and fashion's latest icon, Céline Dion… they said that, by the way, not me.

The latest pair of killer heels might actually and have an extra element of danger: wheels. That's right – not only are they sky-high stilettos but they also double up as roller-skates. Perfect if you've got a photo-shoot at 10pm and a roller disco at 11. The heels previously appeared in campaign images for the brand that were banned by France's watchdog over allegations that the images were demeaning to women. The 'fun' shoe comes in a beginner-friendly trainer version too, but both styles are only available in store. So, if you've got £2k spare and you like pending the next four hours at your nearest hospital,

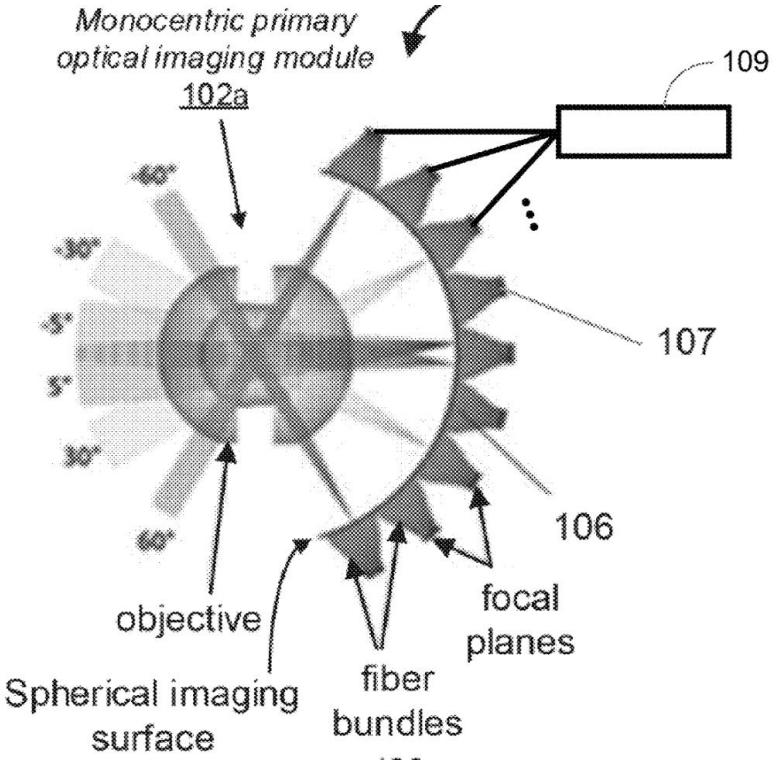
these are the shoes for you. No doubt they will quickly sell out too so if you want to get your hands on a pair, you better get your skates on. Which is the part that really hurts. Collectors of high-fashion-crap, it seems, will throw their money away on stuff no matter how much the designers take the piss.

Let's All Jump Off A Cliff Advertising Suicide Award: The world of big business didn't fare much better when it came to advertising their wares than designing the wares themselves. McDonald's probably created the biggest wave of customer-complaints-for-all-the-wrong-reasons with their 'dead-dad' advertisements around the middle of the year. The storyline goes something like this: a boy's mother telling him what his father was like, which makes him sad because they don't seem to have much in common. Until he eats a Filet-O-Fish at McDonald's, which of course his mother tells him was his dad's favorite too. People found the ad so distasteful that the Advertising Standards Authority 'encouraged' McDonald's to pull the ad within a couple of weeks. Parental bereavement, fast-food and Yorkshire accents… who would've guessed they wouldn't combine to create genius?

In a normal year, such a profound misjudgement of the public mood would have made the ad a surefire winner. McDonald’s, sadly, however, weren’t paying sufficient attention to the bad-taste wardens at Facebook…

Mark Zuckerberg put on an Oculus Rift on 9 October and used Facebook’s new virtual reality platform, Facebook Spaces, to transport himself to Puerto Rico, the Moon, and his house. He broadcast the moment live on Facebook in what turned out to be a rather strange demo of a social platform that doesn’t have a clear use yet. In particular, Zuckerberg’s choice of locations emphasized just how odd it’ll be to watch other people in any sort of serious situation in virtual reality. Zuckerberg’s first stop, along with Facebook social VR chief Rachel Franklin, was to Puerto Rico, where he stood in front of a 360-degree video from NPR documenting the aftermath of Hurricane Maria. He used the opportunity to discuss what Facebook is doing to aid relief — including donating $1.5 million and sharing data with the Red Cross — but it was all pretty strange to watch for what perhaps should have been an obvious reason: Zuckerberg was represented by a floating cartoon character. Cartoon avatars make plenty of sense for the typical use of Facebook Spaces, which is mostly just meant as a digital hangout spot for early adopters of the Oculus Rift. But it clearly isn’t an ideal way to discuss hurricane relief efforts, particularly for a Silicon Valley billionaire doing his best to stay in touch Americans outside of the tech world. It made lines like, “It feels like we’re really here in Puerto Rico,” stand out for clearly being so far off from the actual experience as to suggest that the trillionaire-baby is so far removed from reality that one feels compelled to sell their Facebook shares. Zuckerberg seems to have realized that the experience didn’t translate for viewers. He responded to comments a day later, saying, “When you're in VR yourself, the surroundings feel quite real. But that sense of empathy doesn't extend well to people watching you as a virtual character on a 2D screen. That's something we'll need to work on over time.” He added that his goal was to show how VR can raise awareness to what’s happening across the world. “Reading some of the comments,” he wrote, “I realize this wasn't clear, and I'm sorry to anyone this offended.”

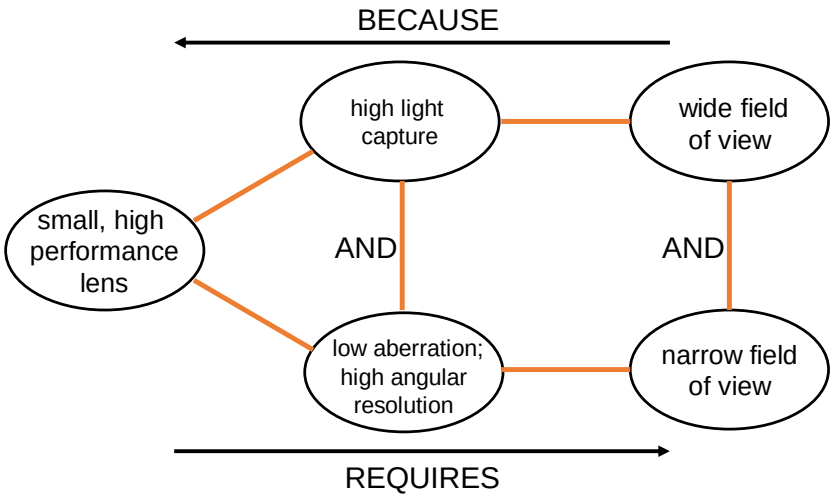
Patent of the Month – Monocentric Lens



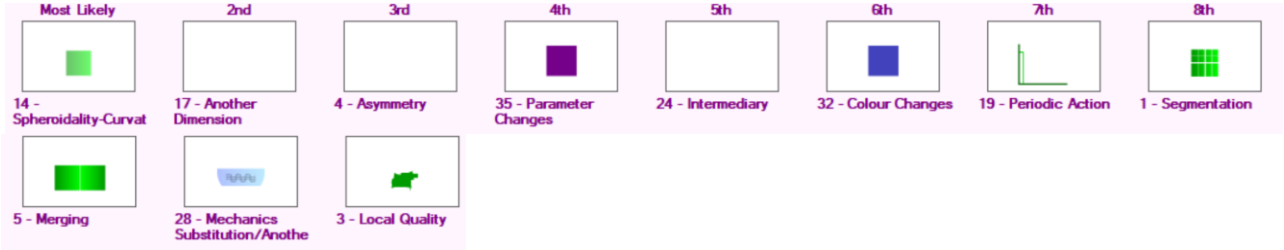
If I was a betting man, I'd say that this month's patent of the month had the smell of TRIZ about it. US9,860,443 was granted to a trio of inventors at the University of California. Two of them have Russian-sounding names. The real giveaway, however, seems to be their background description for the invention. Which goes something like this:

Imagers that require the combination of wide field of view, high angular resolution and large light collection present difficult challenges in optical system design. For example, geometric lens aberrations increase with aperture diameter, numerical aperture and field of view, and scale linearly with focal length. This means that for a sufficiently short focal length, it is possible to find near diffraction-limited wide angle lens designs, including lenses mass-produced for cellphone imagers. However, obtaining high angular resolution (for a fixed sensor pixel pitch) requires a long focal length for magnification, as well as a large numerical aperture to maintain resolution and image brightness. This combination is difficult to provide over a wide angle range. Conventional lens designs for longer focal length wide-angle lenses represent a tradeoff between competing factors of light collection, volume, and angular resolution. For example, conventional reverse-telephoto and "fisheye" lenses provide extremely limited light collection compared to their large clear aperture and overall volume. However, the problem can go beyond the lens itself. For example, solving this lens design only leads to a secondary design constraint, in that the total resolution of such wide angle lenses may easily exceed 100 Megapixels. This is beyond the current spatial resolution and communications bandwidth of a single cost-effective sensor, e.g., especially for video output at 30 frames per second or more.

They don't go quite to the extent of using the word, 'contradiction', but, nevertheless, the story is one of multiple iron-triangle conflicts and trade-offs, and an industry that conventionally designs through them by compromise. The inventors also didn't quite go so far as including any Bubble Maps. If they had, I think one of them would have looked like this:



When we map this into the Matrix+ wizard, we get the following sequence of Inventive Principles used by others to solve similar problems:



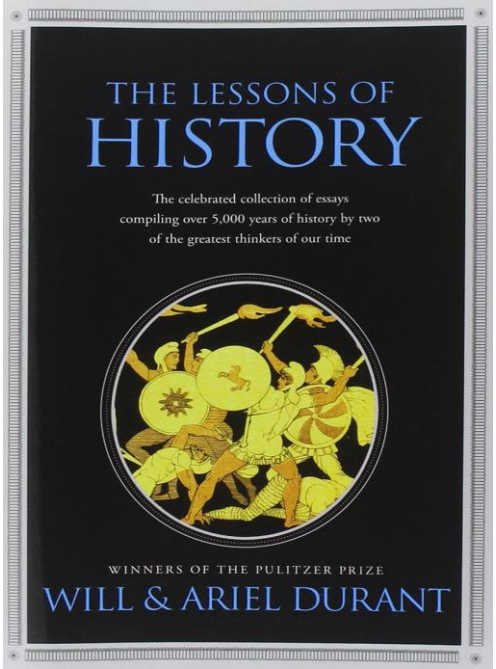
Which we can then use to compare with what the inventors actually did to create their invention…

What is claimed is:
1. An optical imaging system, comprising: a monocentric optical imaging module including one or more optical elements having concentric surfaces to collect light and form an image on a curved image surface; one or more curved and tapered optical waveguide bundles each comprising a plurality of optical waveguides that are optically coupled to the monocentric optical imaging module at different locations to receive different portions of the collected light at the curved image surface, respectively, wherein each optical waveguide bundle includes an input optical waveguide bundle facet to receive light from the curved image surface and an output optical waveguide facet to output light; one or more imaging sensors to receive light from the one or more curved and tapered optical waveguide bundles and to detect the received light, the one or more imaging sensors configured to produce a representation of the image on the curved image surface of the monocentric optical imaging module; and a textured surface structure over the input optical waveguide facet associated with optical waveguides of each curved and tapered optical waveguide bundle to enhance optical coupling from the curved imaging surface into the plurality of optical waveguides, wherein at least one of the one or more curved and tapered optical waveguide bundles has a curved input facet, and principal rays of the monocentric optical imaging module input to the plurality of optical waveguides are substantially aligned with an axis of a corresponding optical waveguide to facilitate propagation of light through each optical waveguide in producing a substantially uniform divergence of the light that is output from each of the one or more curved and tapered optical waveguide bundles.

Did you spot the read-across?
Principles 14 (Curvature), 17 (Another Dimension – ‘tapered’), 3 (Local Quality – textured surface), 35 (Parameter Change – optical waveguide…), 5 (Merging – …bundles…), 1 (Segmentation – …multiple).
Easy when you know how.

SYSTEM ATIC INNOVAT ION

Best of the Month – The Lessons Of History



So, we travel back to 1969 for our selection this month and the work of genius that is Pullitzer Prize winning Will and Ariel Durant's masterwork, 'The Lessons Of History'. Well, actually, their official masterwork is the lifelong project that was The Story Of Civilisation, but given that that is a year long project to merely read it, we're probably better off starting with this 102 page gem of a summary. Under normal circumstances, I hate history. Blame that on the world's worst history teacher when I was at school. That plus the fact that we spent all our time studying social history at what felt like, and still to some extent feels like a particular tedious juncture in mankind's evolution story. So, anyway, rightly or wrongly, Mr Hammond left me with not much more than a pathological aversion to almost anything with the word history in the title. Not to mention my agreement with the oft-stated sentiments of favourite author Nassim Nicholas Taleb that historians are charlatans. So it was with some trepidation that I picked The Lessons Of History up. Any more than 102 pages and I'm pretty certain I wouldn't have even done that.

I needn't have worried. The very first essay, 'Hesitations', set my mind at rest from the get go. All historians are charlatans it told me. Summarising all of history in 102 pages is an act of folly. The Durant's had me at 'hesitation'. From then on the whole book and its 13 mini essays were utterly un-put-down-able. Not only beautifully written, but also demonstrating a staggering ability to fly above the minutiae to see the bigger picture.

The Book in Three Sentences: Over the course of history, human behavior has changed, but not human nature. No matter who is in power, the rewards gradually accrue to the most clever and talented individuals. Ideas are the strongest things of all in history because they can be passed down and change the behavior of future generations.

If that doesn't convince you, you can (if you're prepared to do a bit of work) download a free copy here: http://pdflivres.com/ebook_download.php?n=16504. I definitely wasn't prepared to do the work, so I bought my copy. And then found this bullet-point synopsis. Which I'm considering laminating and putting on my office wall:

SYSTEM ATIC INNOVAT ION

The Lessons of History in bullet point form

- History is the most reliable path to understanding the present and anticipating the problems of the future.
- Our knowledge of any past event is incomplete. Most history is guessing and the rest is prejudice.
- The historian always oversimplifies.
- The rate of change increases and inventions cause acceleration to go ever faster.
- History cannot be a science, only an industry, an art, and a philosophy. An industry by ferreting out the facts. An art by seeking order in the chaos of materials. A philosophy by seeking perspective and understanding.
- Total perspective is an optical illusion. We must operate with partial knowledge.
- “Only a fool would try to compress 100 centuries into 100 pages of conclusions. We proceed.”
- History is a combination of the crimes and absurdities of humankind and the parting contributions. This enabled each generation to proceed with a greater heritage than the one before.
- Idea: The contributions and improvement of humankind is the story of humankind. Our story is the story of collective learning.
- Idea: there are three worlds. The first world is the external world. The second world was born when thoughts became possible and consciousness emerged. The third world emerged when our lives became digital. We can now live in a world where we are not physically there and it is not in our thoughts, but it exists.
- Other sciences tell us how we might behave. History tells us how we have behaved.
- The present is merely the past rolled up into this present moment.
- You are what you are because of your past.
- We know 1,000 things about the news of today, but rarely about the past. How can we understand our present without knowing our history? Example of technology wild gamble: the invention of airplanes totally redefines the world of trade and commerce. Previously, water was the primary mode of trade and it dictated which nations rose to power (those with large shorelines like Greece and Italy). Then, suddenly, airplanes shifted the power to nations with huge land masses in comparison to their coasts (USA, China, Russia).
- The lesson of history is that man is tough. History is the map of human character. To know how man will act you must know how man has acted.
- Humans will always be nobler than the universe. Despite dying after a mere blip of time, we know of our existence while the universe knows nothing of its longevity.
- The influence of geographic factors diminishes as technology grows. Man, not the earth, makes civilization.
- Idea: Technology overpowers environment as time goes on. This trend, however, started as soon as man was able to fashion tools, which was a form of technology.
- Progress is real. Man influences his control over the environment as time goes on and technology increases.
- The environment is still the master of man and other species.
- Idea: The trend is clear: our technology is allowing us to overpower our natural world. Imagine a time when we can control earthquakes or hurricanes or tornados. Or, when we went to the moon we figured out how to survive outside of the earth’s atmosphere. We somehow learned to transcend the boundaries of oxygen and spread our species to new places.

- Geography is the matrix of history. If you live on the coast, you will almost inevitably become an addict of the sea. You can smell the ocean for nearly anywhere in Great Britain. What happened? They took to the sea and became the finest naval seamen in history.
- We are controlled by everything around us and in us, but neither one of those two is the whole story.
- Everything was involved in what made us.
- Idea: we are the product of all of the previous events in history summed up and rolled into the present moment. However, even though everything is involved in what made us, there are a few forces that carry most of the weight. Those forces are genetics, culture, environment, and technology.
- The first biological lesson of history is that life is competition.
- Cooperation is real and it expands as technologies evolve, but mostly because it is a form of competition. We cooperate within our group, family, community, and nation in order to make our group more powerful.
- Cooperation is the ultimate form of competition.
- The second biological lesson of history is that life is selection.
- From nature's standpoint, we are all born unfree and unequal.
- Nature loves difference because it is what allow selection to focus on the strong and eliminate the weak.
- Question: how many organisms get selected for? In a given population, what are the odds of a particular set of traits living on and how robust are those odds? What percentage of genes remain during this process?
- Freedom and equality are everlasting enemies. When one fails, the other dies. Only the man below the average desires equality. Those who are conscious of being above average desire freedom. In the end, superior ability has its way.
- The third biological lesson of history is that life must breed. Nature likes large litters and the struggle for survival that ends up selecting the strongest few. Every advance in agriculture and food production is eventually nullified by the increase in number of mouths to feed.
- Medicine and technology nullify natural selection by keeping the unfit alive.
- Much of what we call intelligence is the result of individual education, opportunity, and experience.
- The fertile inherit the earth. The birth rate may determine the fate of belief systems because the more people believe an idea and the more people are trained in an idea (usually the kids of believers), the more that idea will take hold. This has happened with religion throughout a lot of history, but perhaps now it is happening with science.
- All of the history of humankind is a short chapter in the history of biology. And all of biology is a short chapter in the history of the planet. And the planet is a short chapter in the history of the universe.
- History is the story of humankind in a struggle with other species and themselves for the limited resources and gifts of the environment. Competition is the basic law. Competition used to be among individuals. Then it was enlarged and it was among families. Then it was enlarged and it was among communities. And so on.
- The basic reality is competition. If you are not competing in life, what would you develop? A certain degree of competition is necessary not only for progress, but also for survival.

- Idea: Will competition ever be enlarged enough to not be between humans? We would need a stunning wild gamble where another species forces us to bond together and compete against a common foe.
- The child learns through their hands in early life. So perhaps standing on two feet was the method through which man became intelligent.
- Idea: It makes sense to me that intelligence and bipedal walking co-evolved.
- The role of accident was essential for the progress of humankind, but now, suddenly that is changing. Culture was the first way we began overpowering the role of accident. (Think the education system and teaching humans.) Technology is the second (and faster) way we are overpowering the role of accident in genetic evolution and the progress of humankind. Now you can be dealt a poor genetic hand (think learning disability) and our culture and our technology can still help you to survive.
- History is colorblind and can develop a civilization under any race and in nearly any circumstance. In the long run, differences between people yield to the environment.
- People like to think they are a little special. Without this bit of vanity, we might find it harder to push forward. In a way, delusion is a motivator.
- Human nature is the fundamental feelings and tendencies of humankind. By and large, the poor have the same impulses as the rich, but with less opportunity or skill to implement them.
- Social evolution is an interplay of custom with origination.
- The imitative majority follows the innovative minority. History is largely the battle of a few minorities, the winner of which is then lauded as the victor by the majority.
- Out of every 100 ideas, 99 will likely be inferior to the traditional alternative it was proposed to replace.
- No one person can become so well-informed in one lifetime to rethink and fully understand the customs and demands of the entire society.
- It is good for new ideas to be heard for the sake of the few that can be used. But it is also good for new ideas to be tested and questioned.
- Society is not founded on the ideals of humankind, but on the nature of humankind. We are a product of the forces and instincts that drive us.
- The basic lesson of history is that humans are essentially what they have been all throughout history. He changes his habits, but not his instincts. Over the course of history, human behavior has changed, but not human nature.
- The hero is just the product of a situation. Not the other way around. If it were not for the situation, we never would have heard of the hero. In a way, you could say mental toughness or heroism or other qualities of character are merely the outcome of what the situation demands.
- Morals are the way society exhorts behavior from its members.
- We can divide history into three stages: hunting, agriculture, and industry.
- It's possible that things that are vices today were once virtues.
- Gradually, industry changed the structure of human culture and morality. People left the home and tribe to work in factories and live in cities, etc.
- History as it is usually lived is different from history as it is usually written. By definition, historians focus on the exceptional.
- Two examples of huge shifts in our cultural evolution: Copernicus and his discovery that we were but one planet is a vast ocean of planets and galaxies. Darwin and his discovery that we were just an animal that evolved from many other animals. These two beliefs radically changed how strongly we believed in religion. If we are but one

of many planets, why would God care so much about us? If evolution is true, how could an intelligent designer have created us?

- Civilization itself is the most remarkable thing humankind has done.
- Civilization requires a delicate balance of social impulses with animal impulses.
- Civilization is the social order that promotes cultural creation. Society needs order and personal freedom / creative liberty. These appear to be at odds with one another, but it is often a tense, delicate balance between the two. If social order is too strong, freedom is restricted. If social order is too low, cooperation is not enabled to the degree to create civilization.
- You want to reign in your impulses and weaknesses to the point where they are useful, but not excessive.
- It is very dangerous for an individual to think that — even with 30 or 40 years of studying — he can judge and overcome the collective wisdom of the human race. Old ideas are very powerful.
- It is very possible that religion has enabled humans to collaborate all throughout history and make civilization possible.
- The goal of religion and morals and ethics and really any shared belief system is at least partially to overcome the impulses of our hunter-gatherer, reptilian brain. We try to overcome our animal instincts with social instincts. We are casting votes for a new identity that we hope will overpower the natural identity we have.
- One interesting take on why the decline of religion is quite bad: if religion is the shared belief that unifies a civilization and that belief system dies, then what will hold the civilization together?
- In every age, the forces of the individual seem to overpower the forces of the group. When all else fails, people will do what serves them best. They will do what ensures their survival.
- Idea: perhaps our natural wiring to ensure our own survival at all costs is why we are so moved by the act of sacrificing yourself for another. Think: Hodor in Game of Thrones.
- The word sin is relevant only in the sense of the individual violating the group.
- Reason cannot be the dominant aspect of any age because it is just an instrument. Reason and rationality are tools for thinking, but there are many other useful approaches that involve reason like sentiment.
- No one individual can ever hope to hold a candle to the insights of humanity as a whole. It is a fool's errand to think your ideas will be capable of battling such proven concepts.
- Without religion, it is very possible that the world would have been less moral. Yes, immorality and crime still persisted, but the forces of religion probably dampened their effects.
- As time wore on, philosophers became the driving forces behind societal changes rather than the church. And then, eventually science stole that job from philosophy.
- If history supports any religion it is probably dualism, which would explain the good things and bad things that occasionally happen through the lens of a good god and an evil god.
- The ultimate result of the industrial revolution was the replacement of religious entities with secular ones.
- Previously we thought laws were dictated by God. Now it is clear that they are dictated by fallible humans.
- One lesson of history is that religions have a way of reviving themselves.

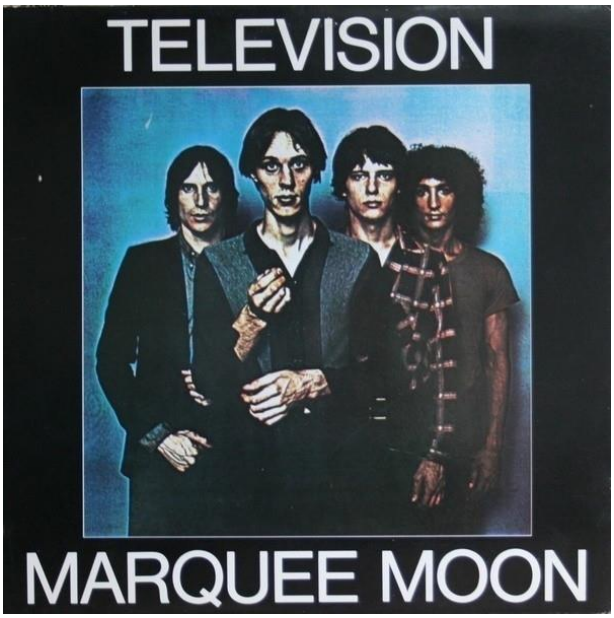
- There is no example in history of a society maintaining moral life among the masses without religion as a force for binding people together.
- The function of religion is to give humankind a belief to be able to tolerate life.
- The individual instincts were hardwired into us by evolution. They are millions of years old. The social instincts are much younger and were learned over the last 70,000 years.
- Idea: In order for a group to let social instincts override the instincts of each individual, we need powerful beliefs and concepts. If we were just a horde of unconnected individuals, we would never cooperate. This is where law and religion and capitalism come into play. They are ideas powerful enough to unite us despite our individual instincts.
- It seems arrogant to doubt tradition too much, too think that your supposedly brilliant mind could develop a better solution in 30 or 40 years than humankind has developed over thousands of years of working together. For this reason, it's quite possible that we discount how useful and powerful religion can be.
- You should never trust an old man to be the judgment of youth because they would just cut off the bold things youth would do before they could do them.
- Idea: this boldness, in fact, is the only way that humankind advances. Most ideas we propose in our boldest moments are wrong. How could they not be? It's not as if we are easily capable of thinking up something brilliant in our narrow window of time on earth. However, every now and then, the bold youth develops an idea that completely redefines the world and if we are to make progress, if we are to become better, we must be bold enough and delusional enough to believe that we can have those ideas.
- Idea: even Plato said that "a certain portion of the population" did not believe in God. So there were probably many proposals and creations that went against God. Many wild gambles that failed. But it was only after science was created that we had a wild gamble that proved worthy of the battle.
- Science deals largely with the external world. It has almost nothing to do with the internal world. What is consciousness? How can we answer this question with science?
- The men who can manage men manage the men who can manage only things and the men who can manage money manage all.
- Normally, men are judged by their ability to produce. Except in war, when they are ranked based on their ability to destroy.
- The concentration of wealth in a small portion of the population is a pattern that repeats itself throughout history. The most valuable talents and skills are confined to a few people, which means the most valuable wealth is confined to a few as well. This pattern shows up again and again.
- Liberty is possible when security has been achieved, but until that point you are facing competition. It is only because of competition that we developed the ability to create liberty.
- The first condition of freedom is limitation. If freedom is absolute, then it dies in chaos. The prime task of government is to establish order.
- The Pax Romana was perhaps the greatest achievement in the history of governance.
- If the majority of abilities are contained within a minority of men (that is, if a few people have more valuable skills than most others), then a minority rule is as inevitable as a disproportionate concentration of wealth.
- All consuming toil is usually the price of genius.

- The sanity of the individual lies in the continuity of his memories. The sanity of the group lies in the continuity of its traditions. Break away from either too fast and chaos follows.
- The only real revolution is in the enlightenment of the mind and the improvement of character. The only real emancipation is individual. The only real revolutionists are philosophers and saints.
- The excessive increase of anything causes a reaction in the opposite direction.
- Idea: this is a disturbing thought, but once culture and shared thought evolved, we suddenly developed the capacity to perform large swathes of “natural selection” on those who disagree with us. Imagine a revolt within a country where one group commits genocide on another group. These mass killings are largely ideological. In a sense, we could say that these killings are a form of “survival of the fittest”, but in this case it is the ideas that the ruling group deems fit rather than physical fitness. Suddenly, ideology becomes a form of natural selection and because we are the ones with the ideas, we are now the force that selects them. If you take this line of thinking far enough, you get to some dangerous territory. Who decides which ideas are fit?
- You can’t fool all of the people all the time, but you can fool enough of them to rule a large country.
- Democracy has done less harm and more good than any other form of government.
- The goal of democracy is not to make every man equal, but to make his access to opportunity more equal. The ideal is not to raise every man to power, but to give him access to each point of entry where his fitness and skill can be tested. In other words, the hope of democracy is to offer a level playing field to start and to let your talents carry you where they may.
- At what point does liberty become excessive? At what point does it become disorder?
- Civilization is made possible by self-restraint. It is clear that freedom is made possible by boundaries of some sort. If we cross those boundaries, we have chaos not civilization.
- You cannot have freedom without order.
- War seems to be a constant among all civilizations and times. It is a result of competition among groups just as individuals compete as well.
- War is, paradoxically, the driver of much technological change and cultural change that leads to long periods of peace afterward.
- We repeatedly enlarge our instruments without enlarging our purpose. We have developed more complex ways to pursue basic human needs.
- We can define progress as the increasing control of the environment by life.
- If education is the measure of progress then we have progressed more than ever before. Education is the transmission of as much of human heritage and learning as we can fully achieve.
- If progress is real, it is not because we are any richer or wiser than those of the past, but because we are born at a higher level and further up the pedestal of our heritage. We are born with the fruits of a larger portion of human heritage.
- Do not feel depressed that life may only have meaning insofar as man puts into it. It is remarkable that we can put any meaning into life at all. The thing that is rare is the capability to even invent meaning for ourselves, for such a task appears impossible for all other animals.

- Do not be an optimist or a pessimist. Instead, be a realist. Accept that life is composed of difficulties and delights. The difficulties are a natural price of existence. The delights are goodies you don't necessarily deserve.
- It is hard to get a sense of the quality of one's own age. We usually know more about a previous age's achievements than their faults. Meanwhile, we usually know more about our faults and downplay our achievements. This makes comparison between ages difficult.
- Human nature changes, but it changes at an incredibly slow, geological pace. We can say with reasonable certainty that human nature has been virtually unchanged in the last 2,000 years and quite possibly far longer than that. Human nature is strongly linked to biology. These are the intrinsic traits that we have and they change very slowly through evolution.
- Progress is an improvement in the means that we use for achieving the same old ends. It's possible that our progress is only of means and not of ends. Do we merely achieve the same desires of 10,000 years ago, but through new, modern means.
- Human nature is uncivilized. It is almost contra-civilization. It is only through culture and restraint and morality that we acquire civilized activities.
- The technique of disseminating heritage and absorbing it has grown incredibly over time. Culture is developing a tighter strangle hold on our behavior than ever before. One way to explain this is to say that there is far more to learn and inherit than there was even 100 years ago. The wealth of human knowledge increases with each passing year and endows a slightly greater advantage to those born today than those born yesterday.
- "Consider education not as a painful accumulation of facts and dates and reigns, nor merely the necessary preparation of the individual to earn his keep in the world, but as a transmission of our mental, moral, technical, and aesthetic heritage. As fully as possible to as many as possible for the embellishment of man's understanding, control, and enjoyment of life. The heritage that we can now more fully transmit is richer than ever before. It is richer than that of Pericles, for it includes the Greek following that followed him. Richer than Leonardo's for it includes him and the Italian renaissance. Richer than Voltaire for it embraces all the French enlightenment and its ecumenical dissemination." -Will Durant
- "If progress is real despite our whining, it is not because we are born any healthier, better, or wiser than infants were in the past, but because we are born to a richer heritage, born on a higher level of that pedestal which the accumulation of knowledge and art raises as the ground and support of our being. The heritage rises, and man rises in proportion as he receives it." -Will Durant
- "History is philosophy teaching by examples." -Henry St. John
- Revolutions are just surface level changes. Human nature remains the same. The people merely change with the revolution and fall back into the same underlying patterns.
- Every generation rebels against the preceding one. In many ways, it is natural and desirable.
- When everybody owns everything, nobody takes care of anything.
- You cannot make men equal by passing laws.
- Economic history is the slow heartbeat of the social organism. No matter who is in power, the gains gradually accrue to the most clever and talented. Then, eventually, there is some fracturing of the order, a new minority rises to power, and the pattern repeats itself.
- Most of the poor are victims of racial discrimination and environmental handicaps.

- Every life, every society, and every species is an experiment. It all ends in death eventually.
- Every religion should preach morality, not theology.
- Persons under 30 should never trust the economic, political, and moral ideas of other persons under 30.
- Let our sons and daughters be punished when they break the law, but let us believe in them when they open their hearts.
- Ideas are the strongest things of all in history. Even a gun was originally an idea.
- In old age, you understand how good it is that there should be radicals and how good it is that there should be conservatives. The radicals supply the gas and the conservatives apply the brakes. Both of those functions are indispensable. That tension is required for a functioning society.

Wow In Music – Marquee Moon



They were the first band to call the infamous CBGB in Lower Manhattan home and ignited the New York punk scene, but it took about three years for Television to release an album. Several CBGB peers beat them to the punch. Patti Smith released Horses in 1975, while Blondie and the Ramones had their self-titled debuts hit shelves a year later.
But Television's 1977 debut, Marquee Moon, just might be the most timeless of the bunch.

Despite its long road to completion, the album Marquee Moon remains rock solid to this day, a collection of eight confounding, challenging and inspiring songs that are punk at their core but meander into jammy psychedelia and the rattle and fuzz of late-'60s garage. There's a lot going on here, and nowhere is that more apparent than with the album's title track and crown jewel.

Written by front-man Tom Verlaine and produced by Andy Johns (the late brother of Glyn Johns, who produced albums from the likes of Eric Clapton, the Rolling Stones and the Who), "Marquee Moon" clocks in at a whopping 10:47 (and regularly extended far beyond that when played live).

The first 20 droning seconds are akin to a religious experience, something that could be looped to infinity and hypnotize a sweaty punk congregation. Verlaine lays down an understated repetitive rhythm track—four strums of a B minor, four of a D5, over and over and over until it becomes quite hypnotic (Principle 20).

Then guitarist Richard Lloyd cuts in with a double-stop guitar flourish that tightly zigs where Verlaine zags (Principle 15). Fred Smith then adds an efficient but rumbling bass line for a few bars (Principle 5) just before Billy Ficca joins the party with a kinetic drum fill (Principle 5 again).

Keep in mind, this is all in the first minute of a 10-plus song, and that sequence occurs two more times throughout its epic length (Principle 14, 'Loop').

And each time, Verlaine and Lloyd build and build towards a chorus that hits you like a crashing wave and recedes into a ripping solo. (Unusually, especially for the burgeoning post-punk scene, the solos were actually credited in the Marquee Moon liner notes.)

Lloyd's solo after the second chorus is a beautiful masterclass in staying in step with the melody while still adding enough swaggering embellishments to cut its own path through the song.

Verlaine's turn comes after the third chorus in a much longer, meandering solo that recalls Jerry Garcia's improvised leads. The Jazzmaster devotee takes his time in ratcheting up the tension with a run based on the jazzy mixolydian scale as his bandmates get progressively louder and more frantic (Principle 4).

Everything comes to a head at the 8:42 mark, when guitar, bass and drums collide, leaving behind shimmering piano and guitar twinkling briefly before the guys jump back into one final verse to close things out.

Couple the ebbs and flows of this wall of cascading sound with Verlaine's twangy voice and dark lyrics about urban life and "Marquee Moon" takes on a near-Homeric breadth.

It is probably the best representation of what set Television apart from their three-chord Bowery counterparts. Both Verlaine and Lloyd were adventurous as guitarists on the burgeoning Big Apple punk landscape, from the interlocking guitar chords on the intro to the snaking solos. The fact that they nailed all of them—from gloriously messy to perfectly precise—makes this lengthy opus a scene-defining single.

Marquee Moon was ranked number 381 on Rolling Stone magazine's 2004 list of the 500 greatest songs of all time. It was then voted number 41 on its 100 Greatest Guitar Songs list in 2008.

It remains a song that has provoked a certain, ahem, obsession from fans. Something like this…

.0 - 1:04.9: **the song's canonical three interwoven rhythm parts (at 31.2 is first appearance of vocals, 'I remember');**
1:04.9: **beginning of Lloyd's 1st guitar-passage; it occurs 3.2 sec. after Verlaine finishes stressing the word 'elsssse' in the line: 'hearing something elsssse';**
1:37.0: **occurrence of a guitar-crescendo, about 1.7 sec. after Verlaine finishes the phrase 'Just waitin' ', marks the end of Lloyd's 1st guitar-passage (lasts 32.1 sec.);**
1:37.0 - 2:26.1: **the three interwoven rhythm parts occur for the 2nd time for 49.1 sec.;**
2:26.1: **2.4 sec. after Verlaine stresses the word 'sadddd' in the phrase 'don't you be so sadddd', is the beginning of Lloyd's 2nd guitar-passage;**
2:57.5: **end of Lloyd's 2nd guitar-passage (lasts 31.4 sec.);**
2:57.5: **0.3 sec after Verlaine finishes stressing the word 'Hesitatinnnn' '... , is the beginning of Lloyd's 1st and only guitar-solo;**
3:09.5: **end of Lloyd's guitar-solo (lasts 12.0 sec.);**
3:09.5 - 3:13.5: **Lloyd's very short 4th guitar-passage of 4.0 sec.;**
3:13.5 - 3:54.2: **the three interwoven rhythm parts occur for the 3rd time for 40.7 sec.;**
3:54.2: **2.8 sec. after Verlaine stresses the word 'againnnn' in phrase '... got out againnnn', is the beginning of Lloyd's short 5th guitar-passage;**
4:25.5: **1.6 sec. after Verlaine finishes the words 'Unh Uhhhh' in the phrase ' ...ain't waitin' Unh Uhhhh', there is a guitar-crescendo which marks the end of Lloyd's 5th guitar-passage (passage lasts 31.3 sec.);**
4:25.5 - 4:50.2: **three interwoven rhythm parts occur for the 4th time for 24.7 sec.;**
4:50.2: **Verlaine's long guitar-solo begins;**
4:50.2 - 5:06.6: **relatively simple but elegant guitar-strumming (16.4 sec.);**
5:06.6 - 5:38.4: **languid (i.e., adagio) and dreamy playing (31.8 sec.); however, over approximately the next 1:40, the tempo of Verlaine's playing increases dramatically;**
5:38.4: **the pace of his playing increases to allegretto for 7.5 sec.;**
5:45.8: **the tempo has progressed to allegrissimo for 21.3 sec.; as the tempo increases in stages, Verlaine's playing concomitantly becomes more inventive and more and more ferocious;**
6:07.2: **the tempo has become velocissimo for 21.1 sec.;**
6:28.3: **the tempo is full-fledged presto for 19.0 sec.;**
6:47.3: **the tempo is now prestissimo for 31.9 sec.;**
7:19.2: **the solo slows and becomes more arranged and structured as opposed to improvised; this section**

of the solo is made up of two legendary parts: Part 1's first-half consists of six repeated guitar-lines. (Note: Each guitar-line lasts 3.5 sec.; in what follows, a beat occurs wherever there appears the capital letter 'D', 'A', or 'T'.):

DootAh, DartAhDo Do Do Do Do Do;
DootAh, DartAhDo Do Do Do Do;
DootAh, DartAhDo Do Do Do Do;
DootAh, DartAhDo Do Do Do Do Do;
DootAh, DartAhDo Do Do Do Do;
DootAh, DartAhDo Do Do Do Do Do;

7:43.2: **Followed by a seventh line:**
Do; Do; Do; Do; Do; Do;
which serves as a transition to the second-half of the Part 1;

7:47.3: **the second-half of Part 1 begins, and consists of the first-half's lines 1 through 5 being repeated but at twice the tempo (each guitar-line lasts about 1.8 sec.), and the first-half's line 6 is replaced by a new line:**

DootAhDartAhDo Do Do Do,Do, Do;
DootAhDartAhDo Do Do Do, Do;
DootAhDartAhDo Do Do Do, Do;
DootAhDartAhDo, Do Do, Do,Do, Do;
DootAhDartAhDo Do Do Do, Do;
DootAh,Dah Do DartAh Do, Do, Dah;

8:11.5: **Part 2 of this later section of the solo begins, and consists of twenty four short, repeated guitar-lines over the next 24.0 sec:**

UttAh, Utt;
:
UttAh, Utt;

8:35.5: **these twenty four are followed immediately by a series of 8 short, quick UttAh Utt's; these 8 are played in double-time over the next in 4.1 sec., ending Part 2 at: 8:39.6:**

UttAUtt;
:
UttAUtt;

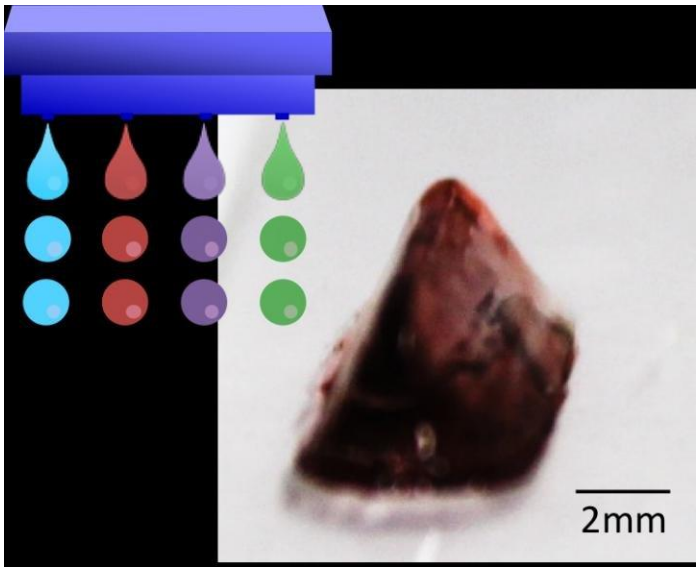
8:39.6: **Part 3 of this later section of the solo begins with a guitar-crescendo, which is followed immediately by beautiful, 'bird-like' guitar notes, which continue for 28.4 sec. Within these 'bird-like' sounds, are interspersed seven additional guitar-crescendos, separated from each other by 4.0 sec.;**
9:08.0: **the 'bird-like' sounds and Verlaine's solo end with a final (8th) guitar-crescendo (so, the length of Verlaine's solo is 4:17.8 = 9:08.0 minus 4:50.2);**
9:09.3: **Ficca's gently hits his cymbals,**
9:16.5: **then the drums;**
9:20.5: **as the bass joins-in, the song has reverted back to the three interwoven rhythm parts for the 5th and final time (for 47.3 sec.);**
9:42.1: **Fade-Out begins as Verlaine stresses the consonant 'd' in the word 'doubledddd' in the final occurrence of the sentence 'I remember how the darkness doubledddd' (the Fade-Out lasts 13.2sec.);**
9:55.3: **the exact end-point of the (UK) LP version of 'Marquee Moon' occurs just as**
Verlaine stresses the consonant 'g' of the second 'listeninggg' in the sentence 'I was listening, listeninggg'. This fading and faint second 'listeninggg' is the absolute last sound emitted on the vinyl (UK) LP version. So, when playing your own LP (or a vinyl-to-digital-transfer of it), if you do not hear the final 'I was listening, listeninggg' then you do not have
your playback volume set loud enough (or its vinyl-transfer process was ended prematurely).

On the full version, we then get:
From 9:56.9 to 10:08.0 (i.e., from 9:57.2 - 0.3 to 10:08.3 - 0.3), Verlaine completes the entire 'I was listening, listeninggg' stanza by singing 'to the rain. I was hearing, hearing something elssssse';
10:10.6 to 10:27.7 is a reprise of the first 17.1 sec. of Lloyd's very 1st guitar-passage, i.e., what he already played at 1:05.1 (at 1:05.4 - 0.3) of the song, but with a slight change: the final 3.0 sec. of this 17.1 sec. guitar-passage is played at a considerably slower tempo making its upcoming guitar-crescendo less abrupt;
10:27.7 This guitar-crescendo or guitar-'swell' (i.e., a rapid crescendo, followed by a gradual

diminuendo), whose second-half includes tinkling piano notes, occurs at
10:32.0 the guitar-crescendo has been slowly decaying for 4.3 sec. allowing the emergence of repeating and tinkling piano notes;
10:40.2 Despite its decay, the guitar-crescendo continues to reverberate faintly, then ghostly, until at, after a total of 12.5 sec. since it first began, the guitar's reverberation can no longer be heard over the still audible tinkling piano notes;
10:41.4 The piano notes, themselves, have grown weaker-and-weaker, and after a total of 5.4 sec. of piano, there is total silence.

The song's five separate three-interwoven, rhythm parts total: 3:46.7 (or 38% of the UK LP.). Lloyd's four non-solo guitar-passages total: 1:38.8 (or 17%). Lloyd's solo is 12.0 sec. (or 2.0%). Verlaine's solo lasts 257.8 sec. = 4:17.8 (or 43%).

Investments – Bio-Ink



Printed replacement human body parts might seem like science fiction, but this technology is rapidly becoming a reality with the potential to greatly contribute to regenerative medicine. Before any real applications, "bioprinting" still faces many technical challenges. Processing the bio-ink and making it stick to itself and hold the desired printed gel structure have been proving particularly difficult especially in inkjet printing. Few methods currently exist for gluing bio-ink droplets together and these do not work for every kind of cell, motivating new alternative approaches.

Building on their previous work, researchers at Osaka University have now refined an enzyme-driven approach to sticking biological ink droplets together, enabling complex biological structures to be printed. They recently published their findings in Macromolecular Rapid Communications.

Lead author, Shinji Sakai says, "Printing any kind of tissue structure is a complex process. The bio-ink must have low enough viscosity to flow through the inkjet printer, but also needs to rapidly form a highly viscose gel-like structure when printed. Our new approach meets these requirements while avoiding sodium alginate. In fact, the polymer we used offers excellent potential for tailoring the scaffold material for specific purposes." Currently, sodium alginate is the main gelling agent used for inkjet bioprinting, but has some compatibility problems with certain cell types. The researchers' new approach is based on hydrogelation mediated by an enzyme, horseradish peroxidase, which can create cross-links between phenyl groups of an added polymer in the presence of the oxidant hydrogen peroxide.

Although hydrogen peroxide itself can also damage cells, the researchers carefully tuned the delivery of cells and hydrogen peroxide in separate droplets to limit their contact and keep the cells alive. More than 90% of the cells were viable in biological test gels prepared in this way. A number of complex test structures could also be grown from different types of cells.

"Advances in induced pluripotent stem cell technologies have made it possible for us to induce stem cells to differentiate in many different ways," co-author Makoto Nakamura says. "Now we need new scaffolds so we can print and support these cells to move closer

to achieving full 3D printing of functional tissues. Our new approach is highly versatile and should help all groups working to this goal."

No patent applications – at least not in English – as far as we can tell.

Read more:
Shinji Sakai, Kohei Ueda, Enkhtuul Gantumur, Masahito Taya, Makoto Nakamura. Drop-On-Drop Multimaterial 3D Bioprinting Realized by Peroxidase-Mediated Cross-Linking. Macromolecular Rapid Communications, 2017; 1700534 DOI: 10.1002/marc.201700534

Generational Cycles – Solo Weddings

Laura Mesi spent £8,700 on her solo wedding, complete with white dress, wedding cake and 70 guests

We reap what we sow. Welcome to the West's latest generational trend: solo weddings. Tell a child when they're growing up that they can be whatever they want to be, and 'don't have to compromise, here's one of the results. When it comes to finding a life partner, there is no such thing as not having to compromise. But at the same time, weddings are a great opportunity to celebrate and spend lots of money. Especially – even in these days of gender equality and extreme political correctness – for women. Western girls are still for the large part taught (and hear from their peers) that their wedding day will be the best day of their lives. Result: thousands and thousands of Millennial and a few dis-illusioned GenX women deciding they're going to have the best of both worlds: a wedding and no need for the compromises associated with acquiring a piece of spousal-ballast at the end of the day.

Here's what the BBC reported last month:

More and more people around the world are choosing to "marry" themselves in symbolic ceremonies, and businesses are catering to the trend. But what motivates someone to say "yes" to themselves?

In the summer of 2000, New York-based performance artist Gabrielle Penabaz decided to throw a wedding party for herself while nursing a broken heart. She carefully chose a location, flowers, a quartz ring, a sweetheart-neckline wedding dress and wrote thoughtful vows. She even wore "something borrowed, something blue" on the day, even though the event was purely symbolic and lacked one crucial component: a groom.

Nonetheless, her friends and family attended and Ms Penabaz says she had the "best wedding ever". Since then she has been "officiating" at other people's self-marriage ceremonies as a form of performance art - a service for which she charges. Her clients are usually single women, although people from all genders and marital statuses have taken part.

She claims to have "married" more than 1,500 people, typically in ceremonies like her own, with mock-up chapels, costumes, cakes and most importantly, vows. "The ceremonies are usually very

cathartic and all about self-love," Ms Penabaz says. "80% of the people whom I married to themselves shed a tear reading their vows. They usually say things like 'I forgive myself' and 'I will no longer call myself ugly'."

Welcome to the world of self-marriage or "sologamy", which has attracted increasing attention over the last few years. While it is not legal to marry yourself anywhere in the world, reports of people holding mock ceremonies go for several decades and can be found everywhere from Japan to Italy, to Australia and the UK. The act has also been the theme of episodes of popular US TV shows such as Glee and Sex and the City, and there are now whole businesses - such as Ms Penabaz's - dedicated to helping people plan their solo events.

"A ceremony can be anything from a simple ritual to a more lavish celebration," says Dominique Youkhehpaz. She officiated at her first solo wedding in 2011 at the US arts festival Burning Man and has since set up the consultancy Self Marriage Ceremonies. She offers a 10-week online course to prepare brides or grooms for sologamy, costing $200, as well as private counselling sessions. Ms Youkhehpaz says she's worked with more than 250 clients to date and business is booming.

"A self-marriage ceremony can be anything from a simple ritual in one's bedroom to a more lavish celebration," she explains. She also thinks it can be incredibly therapeutic for those who take part. "I have witnessed people leave abusive relationships, step more fully into their life's work or meet their beloved after marrying themselves."

Proponents say sologamy is about self-love, acceptance and claiming the social affirmation normally reserved for couples who wed. While there are no official figures about those choosing to marry themselves, the interest comes at a time when the number of unmarried people is at record highs in many advanced economies, according to the OECD.

Briton Sophie Tanner tied the knot with herself after her partner cheated on her

Not surprisingly, businesses have been catering to this new market. In 2014, the Japanese travel agency Cerca Travel reportedly offered a two-day package for solo brides for upwards of £2,500. It included dress fitting, make-up and hair styling and a photo shoot.

Dan Moran, a Los Angeles-based jewellery designer, says he started receiving calls from clients wanting sologamy rings 18 months ago and wedding planners and photographers he knows are getting similar requests. Most of his new clients are "urban, affluent and educated" women, and interestingly many are already married.

"In the coming years, people who work in the wedding industry will definitely have to keep sologamists in mind and tailor their service," he says. Certainly people are willing splash out on sologamy. Italian Laura Mesi wed herself at a "fairytale" event this September, complete with a white dress, three-layer wedding cake, bridesmaids and 70 guests. The 40-year-old, who made the move after her 12-year relationship ended, spent £8,700 on the day.

"It was the best day of my life," says Sophie, here hugging her father - who gave her away.

In the UK, Sophie Tanner married herself in 2015. "For me, it was an important ceremony that demonstrates my commitment to self-compassion, " she told the BBC. "The wedding was the best day of my life, complete with vintage gown, teary dad giving me away, and dancing bridesmaids."

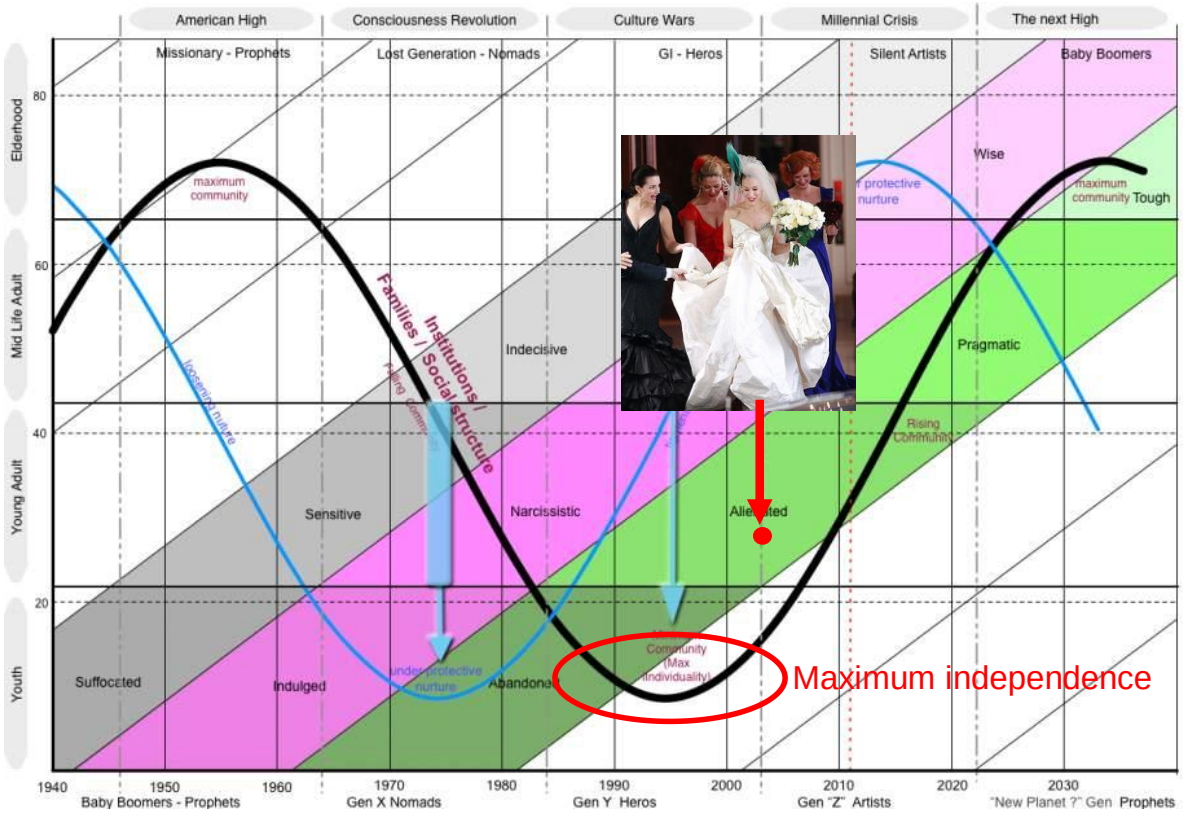
Alexandra Gill, co-founder of consultancy Marry Yourself Vancouver, accepts marrying yourself "kind of is" narcissistic, but adds: "Aren't all traditional white weddings also narcissistic?"
She also says that marrying yourself doesn't have to be taken deadly seriously. Since 2011, her firm has helped solo brides plan their big days, but is now branching out to offer a "ladies' night" concept which celebrates "self-love and sisterhood".

"Let's face it, all women grow up with the fairytale wedding stories and the princess culture isn't going away anywhere," she says. "But self-marriage ceremonies allow us to re-write this narrative in which we don't need a groom."

"Weddings have always been a female-centred celebration, anyway," she says. "Many more women would love to marry to themselves, but they're just self-conscious about it."

Sex in the City's heroic protagonist Carrie Bradshaw, who wed herself in a 2003 episode of the series, would surely agree.

And, therein lies a clue to the trend. It all starts, we think by looking at the cyclical nature of the me-we fight that takes place perennially across society (notice in particular the black sine curve):



SYSTEM ATIC INNOVAT ION

Anyone watching that programme in 2003, mum watching with their daughter or already independent Carrie-follower had an important seed planted in their mind: No compromise.

The fact that society is now heading up the black curve to the next period of ‘community’ dominated society helps explain why the solo wedding is proving to be a media dream. ‘Look how ridiculous we have become’ the message seems to be:

Not everyone welcomes the sologamy trend. Some call it narcissistic and others criticise it as a pointless submission to a patriarchal institution.

Karen Nimmo, a clinical psychologist in New Zealand, says: "Self-dislike is at the root of so many psychological issues, so where marrying yourself is about healing from past trauma or relationship issues it can be helpful.

"But it's important to make sure your other relationships are healthy. If you rely too much on yourself and constantly put your own needs ahead of everyone else you may be slipping into narcissistic territory - and that's an unhealthy and lonely place to be."

Watch this space. I think we can see where this is going. When the Crisis really hits.

Biology – Electric Eel

From Nature last month, an article describing scientists' search for safer, more natural ways to power devices that go into our bodies. Sticking toxic battery elements inside the body, and having to periodically replace them with invasive surgery is rarely viewed by patients or clinicians alike as any kind of ideal solution?

So, in classic TRIZ, 'someone, somewhere already solved your problem' mode, the paper recognizes that a possible 'someone' is nature. One organism that is pretty good at generating biocompatible power (for itself, at least) is the electric eel, and scientists have now used the high-voltage species as a blueprint for a promising new self-charging device that could one day power things like pacemakers, prosthetics and even augmented reality contact lenses.

Electric eels generate voltage using three pairs of abdominal organs that produce electricity: the main organ, the Hunter's organ, and the Sach's organ. These organs make up four-fifths of its body, and give the electric eel the ability to generate two types of electric organ discharges: low voltage and high voltage. These organs are made of electrocytes, lined up so a current of ions can flow through them and stacked so each one adds to a potential difference.

When the eel finds its prey, the brain sends a signal through the nervous system to the electrocytes. This opens the ion channels, allowing sodium to flow through, reversing the polarity momentarily. By causing a sudden difference in electric potential, it generates an electric current in a manner similar to a battery, in which stacked plates each produce an electric potential difference.

In the electric eel, some 5,000 to 6,000 stacked electroplaques can make a shock up to 860 volts and 1 ampere of current (860 watts) for two milliseconds. Such a shock is extremely unlikely to be deadly for an adult human, due to the very short duration of the discharge. (Atrial fibrillation, for example, requires that roughly 700 mA be delivered across the heart muscle for 30 ms or more, far longer than the eel can produce. Still, this level of current is reportedly enough to produce a brief and painful numbing shock likened

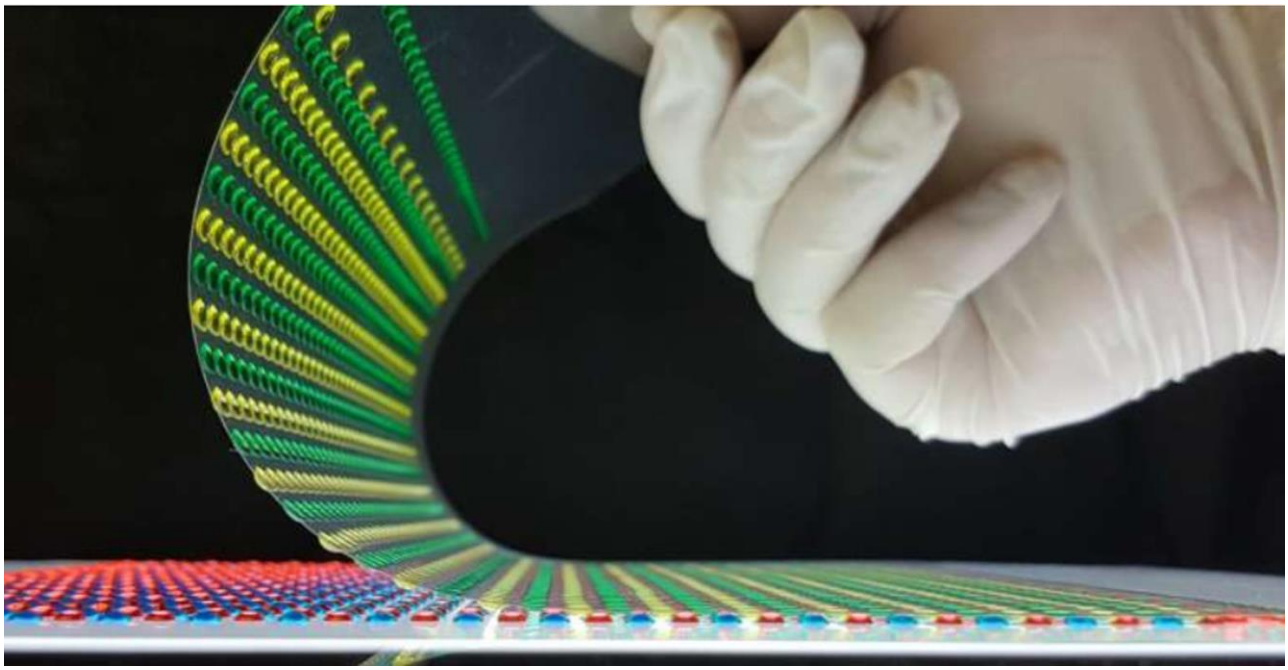
to a stun gun discharge, which due to the voltage can be felt for some distance from the fish. When it comes to humans, the eel is essentially discharging a high-voltage shock as a defence mechanism. This is certainly a use of the capability, but its primary function is to help stun and catch prey. Either way, the central skill required is to be able to generate the electrical charge in the first place.

To recreate the electric eel effect, researchers from the University of Fribourg, the University of Michigan and the University of California San Diego turned to the difference in salinity between fresh and saltwater. They deposited hydrogel, ion-conducting blobs onto clear plastic sheets and separated them with ion-selective membranes. Hundreds of blobs containing salt and freshwater were arranged in an alternating pattern. When the team had all these gel compartments make contact with one another, they were able to generate 100 V through what is known as reverse electrodialysis, where energy is generated through differing salt concentrations in the water.

While the eel triggers the simultaneous contact of its electrocytes using a neurotransmitter called acetylcholine as the command signal, the team achieved this by carefully working a special origami pattern – called a Miura-ori fold – into the plastic sheet. This meant that when pressure was applied to the sheet, it quickly snapped together and the cells shifted into exactly the right positions to create the electricity.

The device, which the team calls an artificial electric organ, isn't in the same ball park as an eel in terms of output, but the researchers do have some ideas around how to boost its efficiency. It points to the metabolic energy created by ion differences in the eel's stomach, or the mechanical muscle energy, as some of the possibilities, but does note that recreating these would be a major challenge.

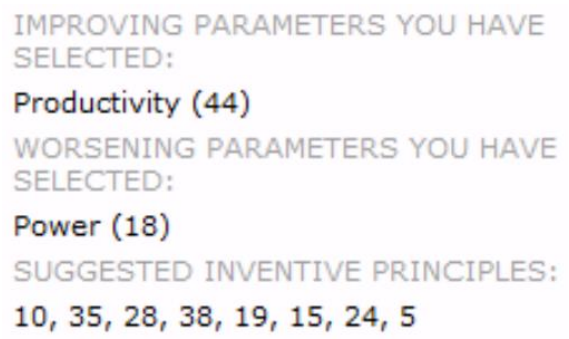
"The electric organs in eels are incredibly sophisticated, they're far better at generating power than we are," Mayer said. "But the important thing for us was to replicate the basics of what's happening."



Translating solutions from the natural world into useful products and services always make for great stories, and here’s hoping that this one makes it all the way to that rare family of genuine biomimetic innovation success stories.

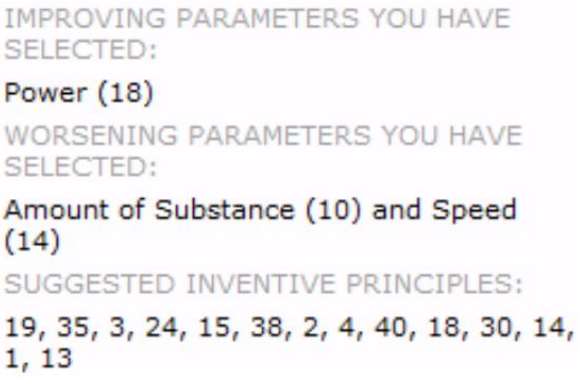
In the meantime, perhaps the most useful thing we can do here is try and understand the electric eel's amazing killer charge solution from a contradiction solving perspective.

One way to think about what the eel (actually, it's not really an eel, but it looks like one, and so that's what the biologists called it) has achieved is 'merely' a jump along the Object Segmentation trend. Or several jumps. We know that the 'field' always wins over mechanical solid, fluidic or gaseous solutions eventually, and for a whole host of reasons, not least of which is that fields are inevitably more efficient from a resource-usage perspective. So, one way of modelling the electric eel is to say it has successfully evolved a solution to the Productivity versus Power (killer charge is about volts x amps) conflict. Something like this:



Sure enough, Principle 28, Mechanics Substitution is one of the most frequently used strategies to solve this kind of productivity-power conflict.

Mapping the step-change at this system level is of interest, but it doesn't contribute anything to the understanding of the scientists and thus how they might engineer their own equivalent solution. Taken at their level, the conflict becomes something much more like the desire to generate power when the only resources within the system able to assist are chemical in nature. Here's how we might map that problem onto the Matrix:



So how do these suggestions correspond to the electric eel solution? Pretty well it seems:
Principle 1 (Segmentation) – long chain of individual electrocytes
Principle 19 (Periodic Action) – momentary…
Principle 13 (The Other Way Around) - …reversal of polarity
Principle 24 (Intermediary) – sodium
Principle 3 (Local Quality) – local differences in salt concentration

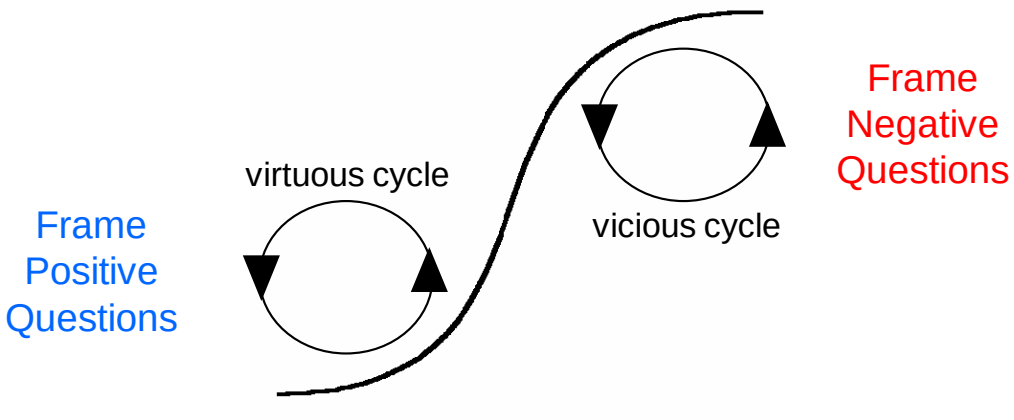
Now, perhaps, the scientists need to look at some of the other Principles? I know what I'd do…

Short Thort

The Perception Mapping tool continues to be one of the most frequently used within the SI suite. Since the beginning, there has been a debate about whether it is better to formulate the initial question as a positive one ('people would buy-in to change if…') or as a negative one ('people don't buy-in to change because…'). The truth is, the process will work either way around so long as the participants remain consistent in direction throughout the process. The truth, too, is that sometimes positive works better than negative, and vice versa. Now we know why. And so we can propose the following heuristics:

If the system you're analyzing is in the first half of its evolution, you need to find the virtuous cycle loops that will drive the system up its s-curve. With this in mind, it is better to frame positive questions.

If the system you're analyzing is in the second half of its evolution, you need to find the vicious cycle loops that are preventing the system from jumping to the next curve. With this in mind, it is better to frame negative questions.



News

US SI Certification Programme

We are happy to announce that we will be running our public Certification programme again in Minneapolis in 2018. The nine-day programme will be divided into three, three-day sessions, the first of which will take place during the week of 19 February. The second and third sessions will take place in April and June, respectively. More details from the SI website

World TRIZ Sites Project

We are pleased to announce our support for good friend, Professor Toru Nakagawa's initiative to build and maintain a compendium of global TRIZ resources. The purpose of the project is clear in the symbol mark:

For these three decades, TRIZ has been proliferated much across the world to the extent that the various activities, achievements, and accumulated knowledge are not viewable easily. We know that you and many others are working actively and posting their activities/results in their own Web sites. Thus, let's make a list of those TRIZ Web sites in the world, so that we all can get connected better and work together. This project can best be carried out by the collaboration of many TRIZ leaders/colleagues in the world, working in different countries and in different languages. Darrell is the 'Global Co-Editor', so probably best to contact him in the first instance if you want to get involved. Or you know of some hidden TRIZ resources that you think more people need to know about. Or both.

Australia
It's been a while, but it looks like we'll be back in Sydney and Melbourne for two trips in the first quarter of 2018. The first trip will be in February, the second in March. The latter of the two will probably be the longer of the two and currently has a couple of free days if anyone is interesting in having Darrell come and do something with them. You know where to get hold of him…

TRIZ Journal
By the time you read this, the newly re-launched TRIZ Journal should be up and running. Check out triz-journal.com and make sure you (re-)pin the link into your Favourites page. Better yet, read the new Mission and get contributing.

The Times
Hey look, one of our 'award winning' solutions found its way into The Times on 29 December. Congratulations to Kobus and the University of Buckingham…

Flushable camera is just the job to keep fatbergs at bay

Tom Whipple Science Editor

Somewhere beneath our feet, fatbergs are forming. Great globules of lard and wet wipes are congealing to block our sewers, costing millions to remove. How do we stop them?

Scientists think that the answer is a flushable camera.

The exact path of sewers is only hazily known, and the places where blockages are likely to form even less well known. Spotting them is expensive, requiring access to manholes and telescopic cameras.

Kobus Cilliers, an inventor at the University of Buckingham, was contracted by an Australian water company to devise a better solution. "Sewers are never where the plans say they should be," he said. "The construction company will put them wherever is simplest. There's now a market in trying to find where drains actually lie.

"We normally inspect drains by putting a camera down. But that requires access, costs manpower and is quite expensive. There had to be a better way."

So he looked to how we inspect a different sort of plumbing. "We thought of the camera pill that doctors give you to swallow, that takes pictures all the way in and out. That's a brilliant idea. So we developed a camera the size of a poo. I learnt there is an international standard of what a poo should be."

The camera has temperature and gas sensors that give it a good idea of which sections of the sewer are likely to block, as well as providing visual evidence. "Fatbergs happen when people put fat down the drain, mixed with soap," Mr Cilliers said. "The moment it cools to a certain temperature, it solidifies. By knowing the temperature of the entire drain, we can do something about it."

All of this is useless though, if it does not also know where it is. GPS does not work underground, so the camera combines movement data from its accelerometers with visual recognition software to track its position along the pipe.

Mr Cilliers hopes that thousands of the cameras will be sent to customers and flushed into the system. By the time they are retrieved, they will have mapped the entire route from lavatory to sewage works, and any trouble spots.

SYSTEMATIC INNOVATION

New Projects

This month's new projects from around the Network:

Construction – PanSensic Study
Transport – SI Mentoring Support
Apparel – Design-Thinking-&-TRIZ Workshops
Logistics – SI Certification Workshops
Automotive – SI Certification Workshops
Healthcare – Innovation Strategy Workshops
Healthcare – New Product Development Project
Government – Innovation Strategy Conference
FMCG – Bulletproof IP Generation Project

2018

We'd like to take this opportunity to wish all of our readers a happy, prosperous and meaningful year ahead. This is the time for the innovators.