Systematic Innovation

e-zine

Issue 128, November 2012

In this month's issue:

Article – Periodic Table Of Innovation

Article – The Hero's Journey Enneagram

Humour – More Merging

Patent of the Month – Hollow-Core Photonic Crystal Fibre

Best of The Month – I Is An Other

Conference Report – Art & Anthropology

Investments – Pregnancy Scanner

Generational Cycles – Protest!

Biology – Common Kingfisher

Short Thort

News

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

Our guarantee to the subscriber is that the material featured in the e-zine will not be published elsewhere for a period of at least 6 months after a new issue is released.

Readers' comments and inputs are always welcome.
Send them to **darrell.mann@systematic-innovation.com**

©2012, DLMann, all rights reserved

Periodic Table Of Innovation

Anyone that has attended one of our SI introduction or overview presentations will undoubtedly have seen us put our 'periodic table of innovation' picture (Figure 1) up on the screen at some point during the proceedings.

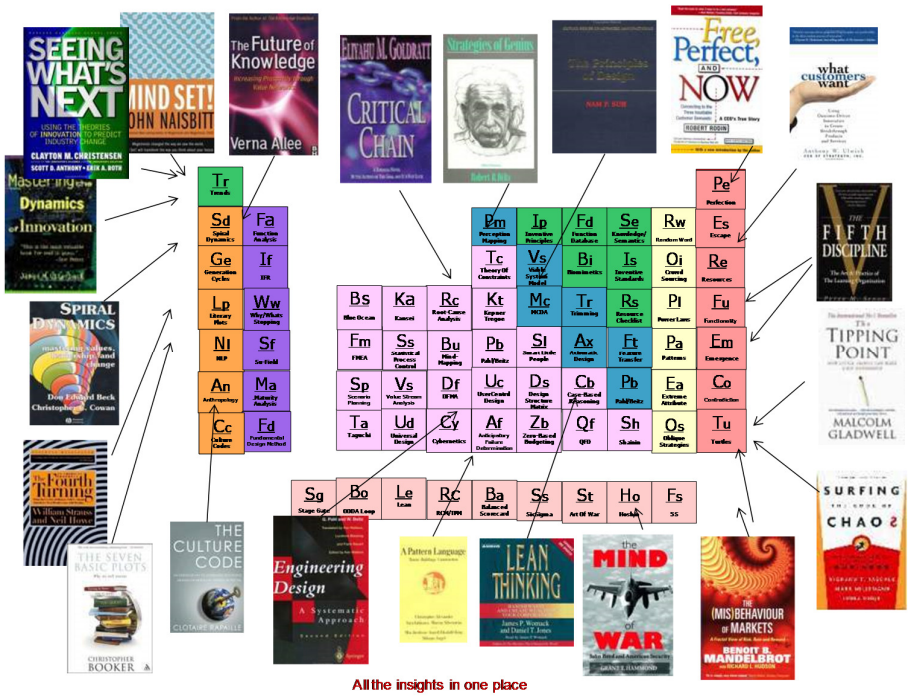


Figure 1: 'Periodic Table Of Innovation'

The intended analogy the Periodic Table offers prospective innovators is that, as was the case for chemists, it provides a means of describing an overarching structure and model of the world. The original Table created a pattern that allowed other chemists to make predictions about the behavior of the various different elements and where to look for new ones. It was Dmitri Mendeleev in 1869 that created the Table that we all remember from our school-day chemistry lessons. The Figure 1 picture is in effect a cartoon hinting at the idea that we can take the most important books, and methods from around the different realms of the innovation world and demonstrate how they fit into a bigger picture. At this superficial level, all our innovation periodic table is suggesting is that, given a particular context, we can select the most appropriate 'elements' to create the right 'chemical reaction' that will deliver the right solution for the innovation challenge at hand. And maybe for many, this is enough. As with any analogy, it is only intended to be taken so far. Even though we've tended to draw our periodic table with the exact same structure as Mendeleev's, that doesn't necessarily mean that there is a precise one-to-one relationship between any given chemical element and a 'corresponding' innovation element. There is no intended correlation between the element 'oxygen' and something in the innovation world that has the exact same characteristics as oxygen… even though, no sooner do we think about how 'oxygen' might be relevant in an innovation context, we can often begin to make some often highly valid connections.

All that said, when constructing our periodic table, we did make a serious attempt to make the chemistry-innovation analogy work on at least one more level.

©2012, DLMann, all rights reserved

SYSTEMATIC INNOVATION

Figure 2 zooms into the Mendeleev Table to focus on the main groupings of elements and overall patterns of atomic complexity and 'reactivity':

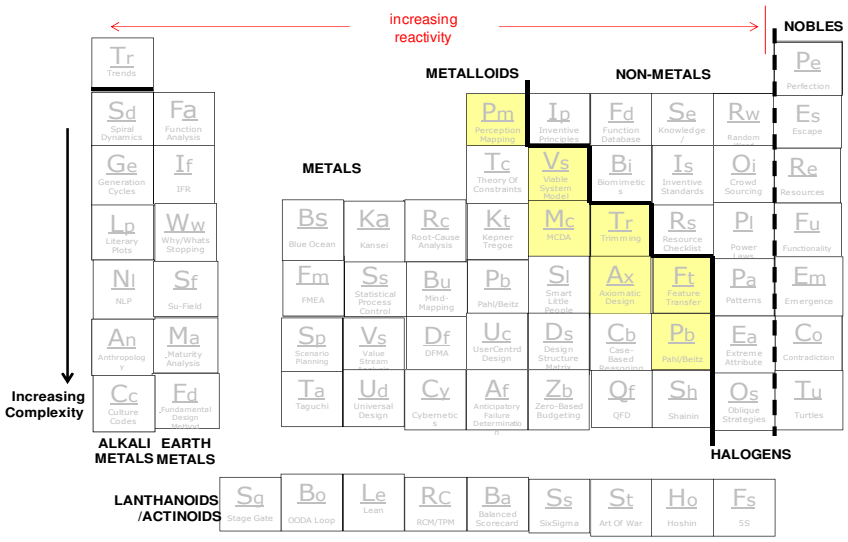


Figure 2: Main Groups Of The Mendeleev Periodic Table

Two things that we used from this view of the world were the idea of increasing complexity as we move down the Table, and, the idea of increasing reactivity (or 'instability') as we move from the centre Groups on the table to the Halogens and Alkali Metals at the right and left ends of the Table respectively. In the innovation context, 'increasingly complexity' seemed to make direct sense in terms of an organizing principle, and so has been used directly – the simpler a tool is, the higher up the table it will be and vice versa. 'Increasing reactivity' was slightly less obvious, but ultimately seemed to make sense in terms of how potentially powerful a tool or strategy was in a problem definition or solving context. To take a couple of extreme examples, we can think of Edward De Bono's 'random word' ideation trigger strategy ('take a random word from a dictionary and see how you can connect that word to your problem') versus the 40 Inventive Principles of TRIZ – which in effect say that you don't need a whole dictionary of random words, but rather just 40 different words. Experience suggests that the 40 Principles are more likely to get a problem solver to an effective solution to their problem, but that sometimes – occasionally – a really wildcard random word can through someone far enough out of their box that it delivers a really wonderful idea. The 'random word' idea in this model is much more 'reactive' than the 40 Principles – in that it could go horribly wrong (e.g. alienating people in a problem solving setting if they don't get a breakthrough), or it could go amazingly right.

So what might 'alkali metals' and 'halogens' have to further tell us about the innovation big picture? This is something that we initially struggled over quite a bit, but eventually, the thing that seemed to make the most sense was that – in the same way that an alkali metal and a halogen combine to make very stable structures (e.g. sodium chloride), the combination of problem definition and solution generation tools also make stable companions… which ultimately meant that the metals have been associated with problem definition tools and strategies and the non-metals have been associated with solution generation tools.

Why that way around? Simply because there are more problem definition tools than there are solution generation tools in the same way that there are more metallic elements than there are non-metals.

©2012, DLMann, all rights reserved

Figure 3 illustrates how we've ultimately structured the main (alkali and earth metal) problem definition tools and strategies. This model is not intended to say that these are the only problem definition tools, but that this is where, whenever we create or uncover a new one, they can be fitted into an overall big-picture view of the world.

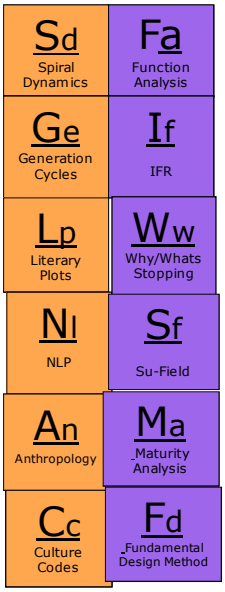


Figure 3: Problem Definition Tools ('Metals')

Figure 4 takes the same basic idea as applied to the solution generation world:

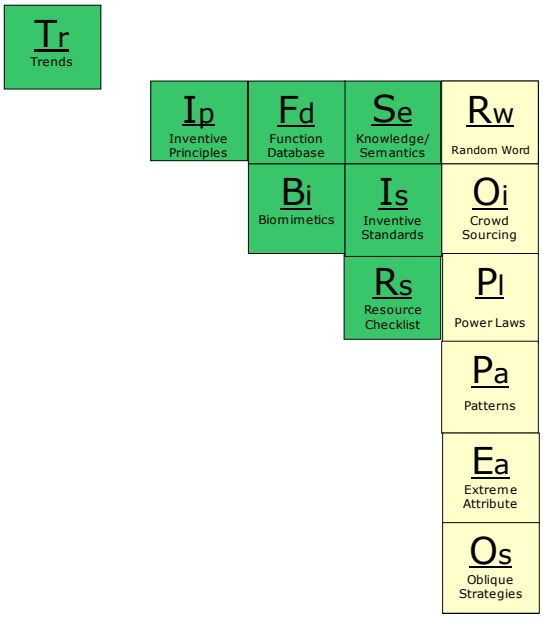


Figure 4: Solution Generation Tools ('Metals')

(Perhaps worth noting that we have placed the Trends tool as our equivalent of 'Hydrogen'. The analogical connection we made here is that, bang-per-buck the Trends are often the simplest tool in the overall armoury that will consistently deliver breakthrough solutions. If you're only going to have one solution generation tool in your armoury, Trends is the one we would start with is what we frequently teach.)

©2012, DLMann, all rights reserved

Which then just leaves us with the 'nobles' and 'metalloids'. Metalloids are those elements like carbon or silicon that turn out to bear some of the properties of both metals and non-metals (e.g. 'semi-conductor'). These we connected to tools and strategies like Perception Mapping or Trimming that are in effect problem definition tools that often directly lead to solutions. They are also a collection of tools and strategies that tend to perform the convergent tasks in the creative process – unlike the metals and non-metals, which both tend to do divergent jobs.

Finally, then, for the 'nobles' our chemistry-innovation analogy, we're looking for aspects of the innovation story that are very stable. The obvious connection here appeared to be the pillars of the Systematic Innovation methodology – those elements that we always ought to keep in mind whatever innovation task we're trying to work on. Figure 5 shows how we've mapped the noble gases as the seven pillars using the 'PERFECT' acronym:

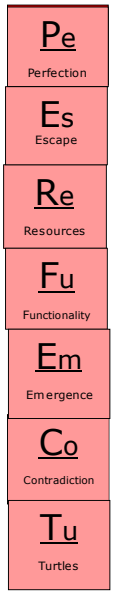


Figure 5: 'Noble Gases' Of Innovation

Hold on, not so fast. We've missed a whole bunch of complex elements at the bottom of the table. How do they fit into our Periodic Table of innovation analogy? Again we struggled for a meaningful connection for a while. In the end the best connection we could make was the idea that this Lanthanoid/Actinoid group corresponded to all of the *execution* aspects of the innovation story. It is all very well to construct a function analysis model and then generate some solution ideas, but it cannot be considered to be an 'innovation' until all of the thorny execution issues have been successfully addressed. In much the same way that the lanthanoids and actinoids are rare (and often have to be created by human intervention), so is the useful management literature on the execution challenge – Figure 6.

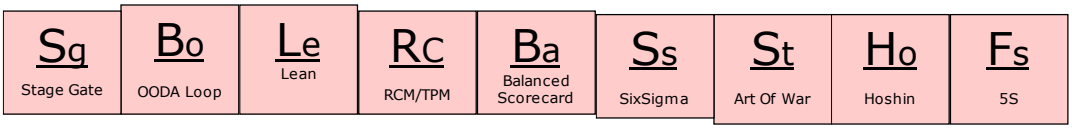
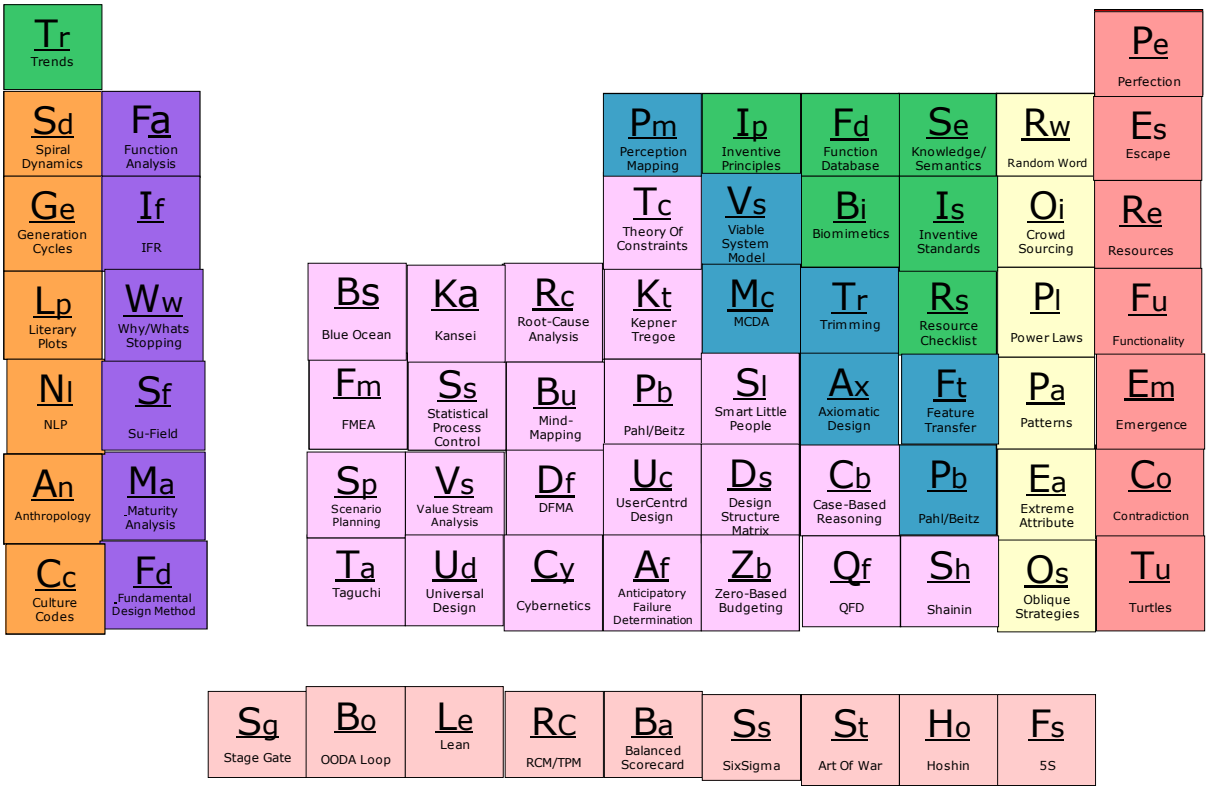


Figure 6: 'Lanthanoid/Actinoids' Of Innovation Execution

Which, when we finally put all the pieces together gives us our overall Innovation Periodic Table:

©2012, DLMann, all rights reserved



Hopefully a useful analogy still. Hopefully now also at a second level beyond the mere idea of being able to combine elements together to achieve a desired innovation outcome.

©2012, DLMann, all rights reserved

SYSTEM ATIC INNOVAT ION

The Hero's Journey Enneagram

I have to admit to always being rather skeptical when it comes to models like the enneagram (Figure 1). Very likely because in recent years it has been commandeered by the New Age community, a group of individuals that tend to eschew anything that bears any kind of scientific rationality in favour of usually un-provable gobbledygook. (Insert images of pyramids, seeing-eyes, astrological charts, Celtic runes, and assorted pentacle shapes here.) When it came to reprinting Edward Matchett's book 'Road To True Professionalism' (Reference 1), given that he uses the enneagram as the main graphic holding the book together, it became impossible to merely ignore the enneagram any longer.

Figure 1: The Enneagram

That reluctant fact in turn lead us to the work of Matchett acolyte, Anthony Blake, and his book, 'The Intelligent Enneagram'. In this book, Blake heads back to one of the initial configurers of the enneagram, G. I. Gurdjieff, rather than in the direction plotted by Matchett. Gurdjieff is much loved by the New Age community, but unfortunately, usually those with a greater tendency to gobbledygook than fact. So that didn't help much. Except that Blake indirectly links the enneagram to literature and film. Taken one step further and he could have made a very nice connection to the work of Joseph Campbell and the 'Hero's Journey' we have been making much use of in recent times (Reference 2).

Figure 2 redraws the enneagram model in terms of Joseph Campbell's findings. We think this is the first time this connection has been made. We also think that there is a very elegant piece of convergence happening in this figure – since it tells us that the enneagram and the Hero's Journey are in fact one and the same thing. Or almost.

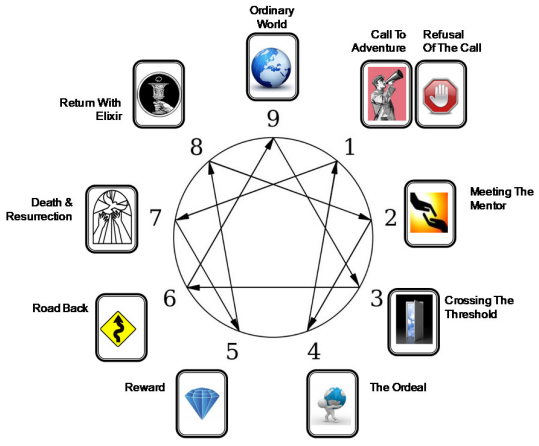


Figure 2: Hero's Journey And Enneagram Combined

©2012, DLMann, all rights reserved

SYSTEM ATIC INNOVAT ION

The aim of this article, therefore, is to try and redeem a modicum of credibility for the enneagram and, hopefully, at the same time highlight what it might have to say that increases the value of the Hero's Journey model in our Systematic Innovation context.

For those that might not have had the pleasure of seeing the enneagram before, it is essentially a clock with 9 gradations around the circumference. One circuit around the clock is equivalent to a complete journey cycle. The number '9' (also often numbered '0') at the top of the image simultaneously denotes the start and end of a journey. The numbers 9, 3 and 6 then define an equilateral triangle that, when mapped to the Hero's Journey describe the different 'worlds' that form an inherent part of any journey cycle. Figure 3 illustrates this connection:

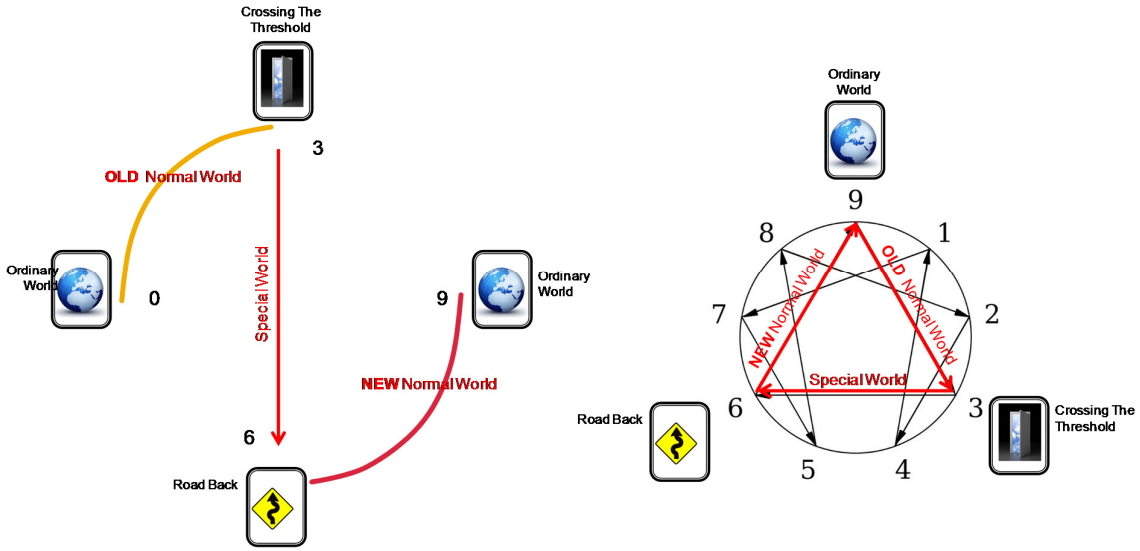


Figure 3: Relationship Between Enneagram & Hero's Journey 'Worlds'

Step 3 in the enneagram corresponds to the 'Crossing The Threshold' moment when a person embarking on a journey decides to leave their 'normal' world and enter the 'special' world no-man's land that exists between s-curves. Step 6, conversely corresponds to the 'Road Back' moment where the new s-curve has been found and we step back into a (new) normal world. Steps 4 and 5, therefore are the key steps present during the transition through the special world. We can make this clearer by re-drawing the enneagram as shown in Figure 4:

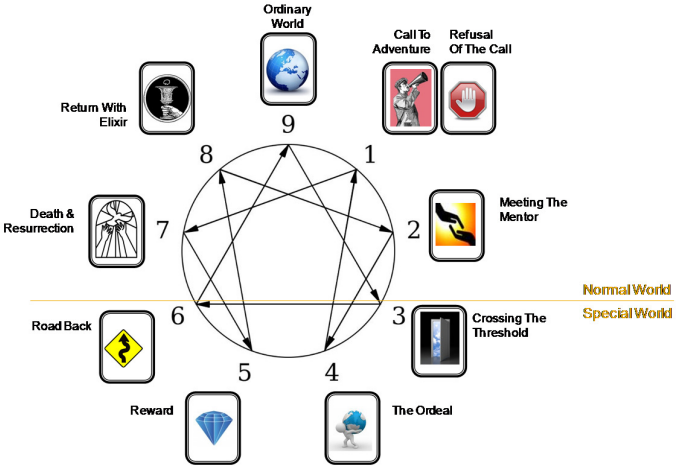


Figure 4: Relationship Between Enneagram & Hero's Journey 'Worlds'

©2012, DLMann, all rights reserved

So far so good? We can now hopefully see that the enneagram is not much more than what we already know from Joseph Campbell's Hero's Journey. Only not quite. The enneagram has six other lines that aren't found in the Hero's Journey. In the enneagram, these internal lines have a significance that Edward Matchett referred to as helping guide the 'search for meaning'.

Each of the six has a specific function which we will now briefly explore in the context of how Matchett labeled each stage of that 'search for meaning' that he believed should accompany every Journey:

1-to-7 **Acceptance**: during an early stage in the journey that something will inevitably 'die' during the journey and that something will be resurrected in new form.

7-to-5: **Submission**: the 'price' of the reward is that something must die.

5-to-8: **Receptivity**: and openness to the difference and gap between what we think is the solution ('the reward') and the actual return with Elixir. The 'reward' is merely the idea that solves the ordeal; the 'return with Elixir' is the successfully implemented idea.

8-to-2: **Service**: the Mentor is someone that has successfully return with the Elixir along their own journey, and are now acting in service of the person just embarking upon theirs.

2-to-4: **Struggle**: it is incumbent upon the mentor to let the person making a journey know that the Ordeal is coming and that struggle will be an inevitable part of passing to the Reward. The mentor will usually have overcome their own version of the Ordeal.

4-to-1: **Assimilation**: it is during the Ordeal that we assimilate and remember back to the call to adventure and our decision to go beyond the refusal. It is about remembering and assimilating the main reasons why we decided to embark past the Refusal.

We think there is some significant value to be had through examination of these steps. The enneagram might ultimately turn out to be just another pretty pattern, but in true 'every-theory-is-wrong-but-some-are-useful' fashion, there is at least some kind of logic behind why the enneagram looks the way it does. Finally, if enneagram pictures are still a bit too 'woo-woo' for you, Figure 5 plots the 'search for meaning' lines onto our 'more scientific' Hero's Journey s-curve map:

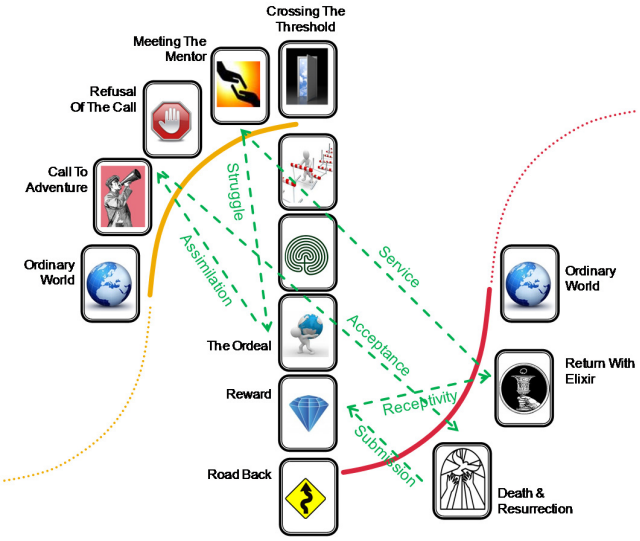


Figure 5: Enneagram 'Search For Meaning' Connections & Hero's Journey

©2012, DLMann, all rights reserved

References

1) Matchett, E., 'The Road To True Professionalism', IFR Press edition, 2012.
2) Campbell, J., 'The Hero With A Thousand Faces', New World Library, 3rd Edition, 2012

©2012, DLMann, all rights reserved

Humour – More Merging

Many people within and around the TRIZ community claim there is no value in using the Contradiction Matrix. Far more effective, they will often claim, is just getting people to brainstorm using a random selection of the Inventive Principles. While this *can* be an effective strategy, it does very much depend upon setting and context. Inventive Principle 5, Merging, is one of the easier Principles to conceptualise, but more often than not it will deliver solution clues that are more alienating than enlightening. Here are some of our favourites of recent months (one or two of which we actually did manage to turn into something useful – the point of any kind of alienating provocation – your challenge is to guess which).

Let's start with a not-so-useful combination of chocolate and teapot that has gone from metaphor to product. If your friends give you one of these for Christmas, you'd probably be advised to start looking for a new set of friends. They might be trying to tell you something:

Food turns out to offer us a whole world of cunning and not so cunning combination examples. I've seen some of my Chinese friends pile every item from a buffet onto a plate all at one time. Including the soup and a very nice chocolate gateaux. I guess this is where our friends at foodpairing.com make their living. I don't think we'll find bacon fairy cakes too high up their list of smart new menu items though:

The world of organized religion doesn't do much to help in the foodstuff arena either:

©2012, DLMann, all rights reserved

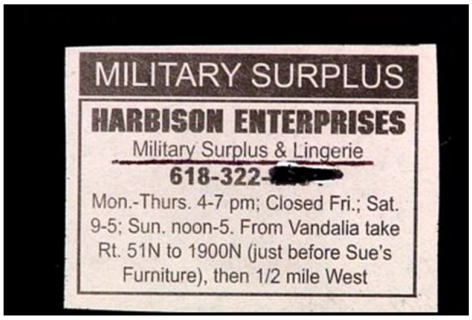
SYSTEMATIC INNOVATION

Could be worse though:

…Although this next one might be close. Or maybe I'm missing something here; the balloons help cheer me up during my appendectomy, right. Especially if they're flying ones.

Here's a favourite from one of the few record shops still existing on the planet. Maybe if the others had followed this lead, I'd not have to spend so much time doing my music shopping on ebay these days. Or maybe ebay could adopt the idea. Yanni never looked so good:

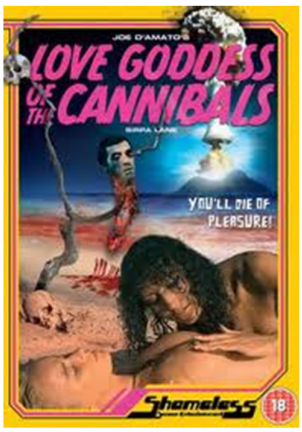
The retail world seems to understand the Merging idea quite well in my areas:



©2012, DLMann, all rights reserved

SYSTEM ATIC INNOVAT ION

Not to mention the creative arts. Especially genre-blending film-makers. Who wouldn't want to go see this sly gem:



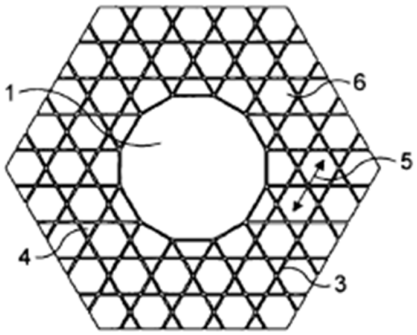
Speaking of death, how about 'Pimp My Hearse'?

That's what I call going in style.

©2012, DLMann, all rights reserved

SYSTEM ATIC INNOVAT ION

Patent of the Month – Hollow-Core Photonic Crystal Fibre



Patent of the month this month takes us on a relatively rare journey to the UK and a bi-national group of inventors based in Bath and Denmark. US8,306,379 was granted to the team on 6 November.

In a splendidly concise invention disclosure we are told:

The present invention relates to a hollow-core photonic crystal fibre (HCPCF) with a large pitch. By "large pitch" it is meant that the photonic structure has a pitch of a size of the order of five times or more as large as the wavelength of light at which the HCPCF operates. The present invention also relates to a HCPCF with a transverse structure comprising relatively thin connecting microcapillary walls. The present invention further relates to methods of manufacturing an HCPCF.

A currently known HCPCF has a hollow core surrounded by a cladding of silica microcapillaries and creates a photonic band gap (PBG), trapping in the core defect electromagnetic waves within a particular range of optical wavelengths. HCPCFs are theoretically designed around two balancing factors: the need for a large PBG at the wavelength of interest and the feasibility of manufacturing the fibre with the methods available. Out of all known cladding structures, the best tradeoff between these two factors is a triangular lattice HCPCF.

Like any helpful disclosure, the (contradiction) problem solved by the inventors is made very clear: the desire to increase band gap and the inability to manufacture such a fibre. Here's what that problem looks like when mapped on to the Contradiction Matrix:

IMPROVING PARAMETERS YOU HAVE SELECTED:

Length/Angle of Stationary Object (4)

WORSENING PARAMETERS YOU HAVE SELECTED:

Manufacturability (41)

SUGGESTED INVENTIVE PRINCIPLES:

17, 3, 15, 13, 4, 31, 10

And here's how the inventors claim to have solved their specific version of the conflict:

A hollow core photonic crystal fibre (HCPCF) having a wavelength of operation, the HCPCF comprising: a core region having a first refractive index; a cladding region surrounding the core region and comprising a plurality of microcapillaries arranged in a transverse structure having a pitch, the pitch of the structure being at least five times larger than the wavelength of operation, the cladding region having a second refractive index higher than the first refractive index, wherein the structure comprises nodes having a thickness <10% of the pitch at its vertices and portions of microcapillary walls connecting the nodes having a thickness of <3% of the pitch in a transverse direction.

©2012, DLMann, all rights reserved

And the benefits the jump delivers:

According to one aspect, a HCPCF with a pitch five or more times larger than the wavelength of operation (a `large` pitch) is provided. Such an HCPCF has various surprising optical properties. The mechanism by which the fibre guides removes some of the limitations present with currently known HCPCFs. The fibre possesses transmission regions at high normalized frequency (.about.20<k.LAMBDA.<400). The fibre exhibits a broad transmission region, which may be, for example, twenty times larger than that of the known triangular HCPCF discussed above, with relatively low loss. The fibre is relatively easy to fabricate and shows low surface mode coupling, a high light-in-core fraction and low chromatic dispersion.

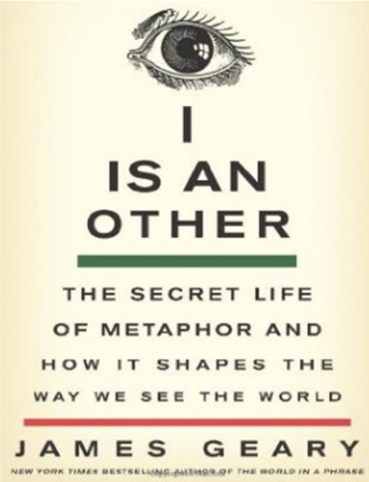
According to another aspect, a HCPCF with a transverse structure comprising relatively thin (<5% and preferably <3% of the pitch .LAMBDA.) portions of cane cladding walls connecting nodes is provided, so that the physical size of the low refractive index cladding structure constituent (e.g. air) approaches that of the pitch whilst the physical thickness of the high index cladding structure constituent (e.g. silica) is only 3% or less of the pitch. Such a HCPCF has improved optical properties because minimising the thickness of the connecting walls means that fewer cladding modes are present for the fibre and the nature of the supported modes means that they interact little with those of the core.

The optical properties of such fibres are explained by the fact that such a fibre, contrary for example to the known triangular HCPCF, does not guide by PBG, but by a mechanism whereby the coupling between the cladding modes and the core modes is extremely weak. Therefore the relevant photonic structures are not those having bandgaps but those that support photonic modes which exhibit a high degree of transverse optical field mismatch between the core and cladding modes.

That last paragraph is perhaps the most interesting of an interesting bunch. In that it seems the incorporation of the relatively simple ideas of ‘transverse structure’ (Principle 17) and of having different regions of the fibre possessing different refractive indices (Principle 3), there has been a shift in the mechanism by which the whole concept of optical fibre works. If this is true, then it represents exactly the sort of 1 + 1 >> 2 synergy we should be looking for with any use of the Inventive Principle provocations. That fact plus the order of magnitude improvement in performance the inventors claim made this a fairly easy choice for ‘Patent of the Month’ status.

©2012, DLMann, all rights reserved

Best of the Month – I Is An Other



At various points in history, mankind has an uncanny knack to head down what turns out to be a knowledge cul-de sac: a mistaken assumption that leads down a seemingly irretrievable path to nowhere. One of these mis-steps occurred, according to James Geary, author of our Best of the Month selection this month, when English philosopher Thomas Hobbes, back in the 17th Century declared that metaphor was an 'abomination' that ought to be swept from the English language. The 17th Century was a time of 'science' and the apparent imprecision of metaphor, when seen through scientific eyes, was viewed as a clear set of woolly and very un-pin-downable, deviations from scientific 'truth'. Hobbes was swiftly followed by others – George Berkeley, John Locke – who wrote at length about the evils of metaphor. Often inadvertently and somewhat paradoxically reverting to metaphor to re-enforce the arguments they were making.

According to Geary, we are still trying to recover from the metaphor-is-the-opposite-of-'scientific' myth. I Is An Other is a rather good step in righting the situation. Although on the face of it, it doesn't seem to add much to the state of the art in terms of the case for metaphor – there is a lot of in depth reference to the work of metaphor-research masters (Lakoff, Zaltman, Osborn et al) - this book turns out to be a clear example of 1 + 1 adding up to substantially more than 2. Indeed, if you're a person who's not familiar with Lakoff or Zaltman (shame on you – we've mentioned them in this part of the e-zine several times!), you'd be well advised to start with Geary in order to give yourself a bigger picture view of the metaphoric world.

Metaphor, Geary convincingly argues, rather than being a distraction actually lies at the very heart of truth, how we build all of our knowledge and – more important in our context here – how we invent and create new solutions (effective creativity is about finding new metaphors for familiar situations). It is also about how people receive and adopt new ideas, and as such lies at the heart of the world of marketers and anthropologists.

I Is An Other makes an excellent first step into our world of metaphor and 'reading between the lines' to understand the differences between what people say and what they do. It's very easy for someone to concoct a rational explanation for what they did or did not do; but it's very difficult for them to use metaphors that are inconsistent with what they are actually thinking. Metaphor extraction, in other words, sits right at the heart of our new (JupiterMu, etc) media scraping tools. We've already published several white papers on

©2012, DLMann, all rights reserved

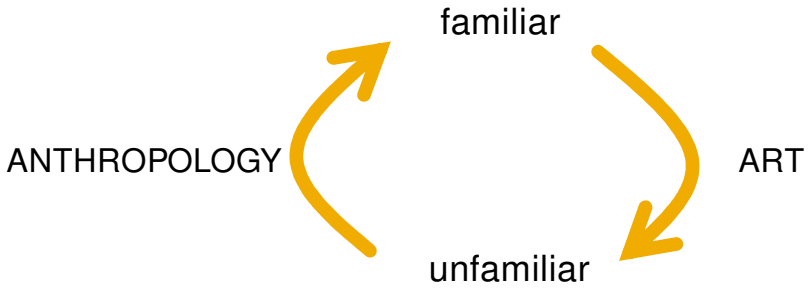
what we're doing. James Geary's I Is An Other has saved us a whole bunch of work in terms of describing *why* scraping for metaphor use is important. For that reason alone (you really do need to know this stuff no matter what walk of life you're walking), you should get hold of a copy of this book.

(Special prize for anyone that can tell us how many metaphors we used in writing this short review. Clue: Geary demonstrates we typically use about six metaphors a minute.)

©2012, DLMann, all rights reserved

Conference Report – Art & Anthropology

Art, it is often said, has much in common with innovation. That connection, plus the fact that all of our TrenDNA work has taken us right to the heart of anthropology made it a fairly easy decision to go and attend this one-day seminar at the Arnolfini in Bristol. Indeed, very early in the session the connection became re-enforced in a discussion about the apparent conflicts between art and anthropology:



Art is about making the familiar unfamiliar; and anthropology is the opposite. We might then extend this model to provide a degree of new insight into the world of innovation: where the creation part is akin to art – seeing the world through new eyes, and the execution part of the innovation story is about taking the unfamiliar and dragging it, in new form, back into the world of the familiar. If defined as 'successful step-change', innovation thus equates to Art + Anthropology. Or the resolution of the conflict between the two. Which, to take one more step forward is precisely the same as the Hero's Journey when we step from the 'normal world' into and then back out of the 'special world' – the special world here being the 'unfamiliar'.

Frankly, after that insight within the first half hour of the session, I could've listened to garbage for the rest of the time and still been happy with the investment of time I'd made. That said, like every conference everywhere these days, what followed was an intriguing blend of the sublime and the 'what time is coffee?'. The event had been conceived and planned by the University of Bristol to explore:

'…the increasingly common theme for artists to explore anthropological and ethnographic concerns in their practice. At the same time, artists themselves have become a subject for study by contemporary anthropologists. In this seminar, researchers working in and between both fields will come together to explore links, friction and potential in a celebration of cross-disciplinary exchange.'

©2012, DLMann, all rights reserved

SYSTEM ATIC INNOVAT ION

The presented papers comprised:

Lucia King , artist-filmmaker/ PhD researcher, SOAS, University of London
The ‘I' of authorship; non-fiction filmmaking on India's traditional cultures by ‘artist-filmmakers' vis-à-vis ‘anthropologists'.
www.luciaking.co.uk

Paul Jones, artist
Territorial Pissing and Other Borderline Acts: Performativity, Relationality and liminality.
http://www.axisweb.org/seCVPG.aspx?ARTISTID=14852
https://sites.google.com/site/archivepaulrjones/

Paolo Fortis, anthropologist, Honorary Research Fellow, Centre for Amerindian Studies, University of St Andrews
Perceptions and representations of military and colonial power among the Kuna.
http://st-andrews.academia.edu/PaoloFortis

6th Hour Productions with Daniela Cavalcante (Pontifícia Universidade Católica de São Paulo)
A Doll's Journey - working with Brazil's travesti community.
http://www.6thhourproductions.com/6TH_HOUR.html

Anthony Elliott, Prince Claus Foundation for Culture and Development
At the Crossroads of Culture and Development: Art as Ethnography in Civic Participation and Conflict Resolution Development Programmes.

If nothing else, you would be well advised to go and check out Paul Jones (sublime) work to get a terrific set of insights into how exactly art sets about making the familiar unfamiliar, and how it is supposed to take participants into a ‘special world’. Plus it’s also pretty funny.

Finally, although not officially connected to the Art & Anthropology event, the Arnolfini had conveniently scheduled a talk by multi-award winning architect Alison Brooks. Titled ‘Hybridism’ her fascinating 90 minute exposition on some of the projects completed by her company revealed a host of other insights regarding the art + anthropology, making-the-familiar-unfamiliar nature of architecture.

While you might have not liked all of the results coming out of Alison Brooks’ company, ABA, at least you could be assured that a lot of thought had gone into the process. Not only was the devil in the archetypal detail, at ABA, projects were all about making sure at least one set of rules was successfully challenged. A pretty good definition, in other words,

©2012, DLMann, all rights reserved

of ‘step-change’ architecture. At one point during the talk, it was suggested that architecture these days was 50% drawing and 50% the ability to write a good story for the client, in itself a pretty good meta rule-change. The reason ABA won more competitions than other architecture firms was put down to their ability to write a better story. Another strong parallel with the innovation world perhaps: the one with the best story wins.

All in all, then, a pretty good day out. A terrific reminder if one were needed that sometimes it’s a really good idea to step outside your own world and into the world of others. Even if you end up finding – as TRIZ/SI would no doubt have predicted – that they weren’t so different after all. The key it seems is seeing the same world through the metaphoric eyes of others.

©2012, DLMann, all rights reserved

Investments – Pregnancy Scanner

This month marks a first for our 'Investments' section in that it takes us a long way away from the traditional world of innovation 'high tech' into something much more akin to the world of smart use of resources and solving a set of real problems in the most effective, efficient manner possible.

The so-called 'developing world' has long been seen as a strong source of innovative ideas – necessity being the mother of invention, so go find it in the places where the needs are greatest. Africans are progressing in every sector as days pass by. Uganda is one of the countries in Africa who has recently won an honour in the Microsoft East and Southern Imagine cup competition. A group of students have again boosted the image of the continent. Three second year students of the department of Computing and Information Technology in Makerere University namely; Aaron Tushabe, Joshua Okello and Josiah Kavuma have invented a hand-held pregnacy scan-like machine they've now called WinSenga.

The machine, which consists of a funnel-like pinnard horn similar to the one used by midwives, can be used to scan a pregnant woman's womb or detect problems such as ectopic pregnancy or abnormal foetal heart beats. According to the team of students, "We called it WinSenga to relate to traditional birth attendants."

According to the inventors, they conceived the idea of inventing this device after their visit to one of the local hospitals in the country. In their words, "when you go to our hospitals, you find the midwife using the traditional pinard to listen to the baby's heartbeat. But they might not always hear anything or get enough details about the baby. We thought we could aid doctors to give the best services,"

"With this device, you can know how old the fetus is, whether it is underweight, its position and breathing pattern. Then decide on what precaution to take or the treatment to give," said Tushabe. "You can access the information anytime you log on because once you are done with diagnosis, it records automatically."

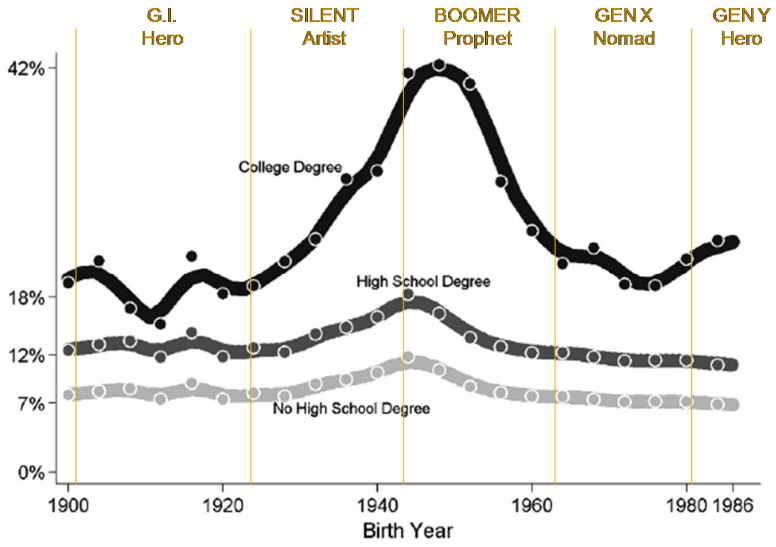
The great 'untapped' resource, in other words, is being able to codify the extensive knowledge of widwives into learning, genetic-algorithm-based pattern-recognition software. A disruptive idea that may well find a home in many other parts of the world: a version of 'appreciative inquiry' that many national healthcare initiatives have thus far failed to tap into.

A potentially huge transformation for Uganda and, hopefully, many other parts of the world too.

©2012, DLMann, all rights reserved

Generational Cycles – Protest!

Some generations protest more than others. Some have more reason to protest than others. Data would appear to suggest that the propensity to protest follows an approximately 80-80 year (or four-generation) cycle – with two generations prone to protest and two less so:

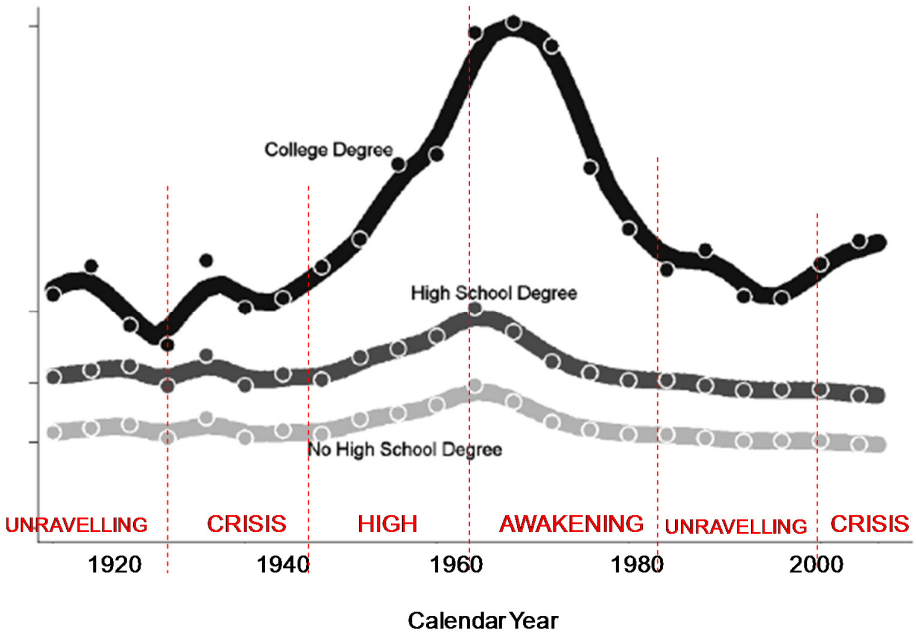


This data comes from a very nice paper entitled 'A Social Movement Generation: Cohort and Period Trends in Protest Attendance and Petition Signing (a copy of which can be found at http://www.unc.edu/~ncaren/publications/files/ASR395369_caren.pdf). As shown in the figure, it is also clear that the tendency to protest is closely correlated with the level of education.

It is also instructive to re-draw the picture in terms of calendar year rather than birth year. We can do this by simply shifting the birth year axis about 20 years to the right in recognition of the fact that it tends to be university students at the head of the protest charge:

©2012, DLMann, all rights reserved

SYSTEMATIC INNOVATION



In recent memory it is the Baby Boomer 'Prophets' that have the biggest reputation for being protesters. As shown in the above image, the 1960s riots came during the 'high' and 'awakening' turnings. In theory, these are the periods in the four-generation cycle where a lot of the re-thinking of the way society works occurs, firstly with the Silent 'Artist' generation who tend to think about what kind of society they want, and then, more emphatically by the Boomer, 'Prophets', determined to express their (narcissistic) feelings.

The Generation X 'Nomads' that arrived in the wake of the Prophets had a much lower propensity to protest. At least on a mass scale. The jump from Prophet to Nomad is one of the more profound of the generational shifts – pretty much everything that one generation does, the other tending to do the opposite.

So, the Boomers tended to get angry at the Nomads for their apparent apathy; 'society is unravelling and you're not doing anything about it'. The Nomads, conversely, look at the Boomer-lead protests and concluded that not only did they ultimately make no difference, but were more likely to have been counter-productive (many media commentators have recently concluded that the Vietnam war dragged on for as long as it did largely *because* of the student protests). Nomad protest thus tends to be on a much more personal level and therefore tends to become invisible. Plus, of course, although they came of age during an 'unravelling' period in history, it was also a time of relatively high growth and therefore prosperity for the majority. In other words, there wasn't that much worth protesting about.

Moving forward to today, what the pictures also show is that, now we're entering back into the middle of society's latest Crisis period, the number of protests will increase. And, moreover, will be triggered by the current Hero generation (to be taken to a higher level again, if the cycle progresses to plan, by the next generation of Artists, who will start coming of age in 2020). Parents of young children beware, the current 'suffocation' being inflicted on your offspring will soon come back to bite us all.

©2012, DLMann, all rights reserved

SYSTEM·ATIC INNOVAT·ION

Biology – Common Kingfisher

The Common Kingfisher hunts from a perch 1–2 m (3–6 ft) above the water, on a branch, post or riverbank, bill pointing down as it searches for prey. It bobs its head when food is detected to gauge the distance, and plunges steeply down to seize its prey usually no deeper than 25 cm (10 in) below the surface. The wings are opened under water and the bird rises beak-first from the surface and flies back to its perch. At the perch the fish is adjusted until it is held near its tail and beaten against the perch several times. Once dead, the fish is positioned lengthways and swallowed head-first.

A significant challenge for any diving bird is being able to spot and then capture potential prey beneath surface of the water. Two problems in particular contribute to this challenge: firstly the likelihood of surface glare caused by reflection, and secondly, the change in refraction between air and water. Here's what these two problems look like when mapped on to the Contradiction Matrix:

IMPROVING PARAMETERS YOU HAVE SELECTED:

Ability to Detect/Measure (49)

WORSENING PARAMETERS YOU HAVE SELECTED:

Length/Angle of Moving Object (3) and Illumination Intensity (23)

SUGGESTED INVENTIVE PRINCIPLES:

26, 28, 24, 3, 13, 5, 37, 2, 17, 16

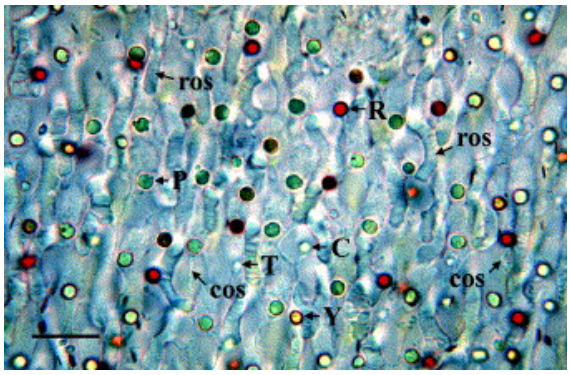
©2012, DLMann, all rights reserved

SYSTEM ATIC INNOVAT ION

The common kingfisher has long been recognised as having an uncanny ability to catch fish (a clue in the name, perhaps?), but it is only relatively recently that the bird's visual system has been sufficiently understood to work out how such a high level of accuracy has evolved.

Like many birds, the eyes of the common Kingfisher have two foveae (the fovea is the area of the retina the greatest density of light receptors), and a kingfisher is able to switch from the main central fovea to the auxiliary fovea when it enters water; a retinal streak of high receptor density which connects the two foveae allows the image to swing temporally as the bird drops onto the prey. The egg-shaped lens of the eye points towards the auxiliary fovea, enabling the bird to maintain visual acuity underwater. Because of the positions of the foveae, the kingfisher has monocular vision in air, and binocular vision in water. The underwater vision is not as a sharp as in air, but the ability to judge the distance of moving prey is more important than the sharpness of the image.

Regarding the glare problem, each cone cell of a bird's retina contains an oil droplet which contains several carotenoid pigments. These droplets enhance colour vision and reduce glare. The oil droplets come in a number of different colours:



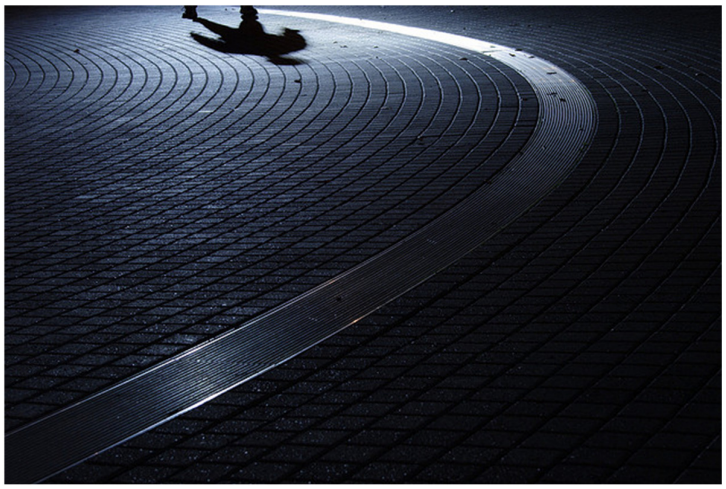
Aquatic kingfishers have high numbers of red pigments in their oil droplets; the reason red droplets predominate is not fully understood, but recently reported biomimetic applications of the kingfisher eye – as shown on the BBC series 'Miracles Of Nature' – seem to suggest that looking through what effectively becomes a red filter does an extremely good job of eliminating glare.

All in all, a pretty good illustration of Inventive Principles 3 (Local Quality) and 5 (Merging). Even better that the solution is now being adopted in service of human versions of the Kingfisher detection problem such as air-sea search and rescue and tracking the migration of whales. One of the still relatively rare cases of commercialized biomimetics.

©2012, DLMann, all rights reserved

Short Thort

"In the long run, men hit only what they aim at.
Therefore, they had better aim at something high."
Henry David Thoreau



"Peace of mind produces right values,
right values produce right thoughts.
Right thoughts produce right actions
and right actions produce work
which will be a material reflection for others to see
of the serenity at the center of it all."
Robert M. Pirsig

News

Hargraves Conference
It looks like we've been fortunate enough to speak at next year's Hargraves conference in Australia. We will also be doing an ICMM workshop during the conference week, which is the one beginning 11 March.

IIT
The frustration of postponements of planned workshops at IIT(B) in India finally looks to be over and we now have some official dates in April (week beginning 15th). This should mean an opportunity to harness together all of the other India workshops we've been discussing with clients into one trip. Although, that said, we already know that there will be at least one trip to India for Darrell before April. Details of the full itineraries on the website shortly.

Engineers Ireland
We have been invited to keynote at an Engineers Ireland event to be held in Dublin in February (27th). The one day event will be themed around 'Design & Innovation' and our subject will be 'Mindset'.

©2012, DLMann, all rights reserved

University Of Buckingham
We are pleased to announce that the new Lean MSc at the University of Buckingham is fully subscribed for its inaugural year. We will be teaching the 'innovation' modules through the programme, starting with an introduction session on 16 January.

Social Media Sense-Scraping
Our collaboration with IT company, Akumen, grows apace this month with the launch of a number of new services based around our jointly developed social media scraping, sense-making tools, JupiterMu, SaturnDelta and Mental Gears. Expect a series of white papers to be forthcoming on each specific tool in the coming weeks and months.

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

FMCG – Rembrandt's IP licensing study
Automotive – turnkey design-make project
Automotive – design study
Automotive – strategic workshop
Healthcare – Change Management Strategy/Design workshops
Aerospace – IT Infrastructure project design
Academia – Spin-Out proposal evaluation
Medical Devices -

©2012, DLMann, all rights reserved