

A Strategic Innovation Model - Part 1

Life, Love and Innovation



Do today's popular models of innovation limit innovation? We think so. This article seeks to help to fill the gap by providing a different perspective - perhaps in a slightly unusual way.

We start by using metaphorical parallels to draw out the limitations in current innovation models, and develop a non sequential, top level process model of innovation which in turn leads to a discussion of the implication for innovation managers and organisations. This is based upon a research programme with the university of Bath in the mid 2000's and observations and experience of consultancy innovation programmes with many companies and industries since - from automotive, to medical devices, FMCG to non-profit, jet engines to banking.

Existing models tend to see innovation as a pipeline flow, leading from creativity through idea management to implementation. We agree these are valid but suggest these are useful only at an **operational** level.

Here we offer a top level **strategic** innovation model, which puts existing approaches into context and highlights some areas where existing models could be actually limiting innovation. We hope it provokes some thought.



Life?

“How do you live life?”

How would you answer that question? Would you say “each morning, I wake up, eat breakfast, commute, do some work for my employer, talk to my co workers, eat, commute back home, have dinner with my family, enjoy some entertainment and then go to bed and at weekends its different”?

This way at looking at life is correct, but instinctively there is more to life than a series of sequential activities. This is obvious.

Or maybe we go scientific and think about life represented as biological processes - of breathing, sensing, reacting, moving, digesting, reproducing and so on. But still there is more to life than just biological

processes. Life is also about joy, about hope, pain, love, grief, pride, exhilaration, boredom, disappointment, feelings of turmoil, or feelings of peace.

And life is not something we do on our own, it is also about our relationships, our place in society, interactions with others and our place in others hearts. Why are we here in the first place? What is our purpose? What will be our legacy, our achievements? This complexity and richness cannot be reduced to a simple set of activities, or biological processes.

Life is not just a set of activities.

Love?

“How do you do love?”

Love is part of life and everyone experiences love. But how would you describe it? How do you “do” love? What is the process?

You may say “well, for me, love starts with buying some fashionable clothes, getting a good haircut and a flash car, going to some trendy places where I can meet someone I fancy, and then we get talking, and I buy some drinks and a meal, then start dating - and eventually we fall in love”

Whilst in some sense, this is true, we all know that love is far more than a sequential

set of activities. Far more than that. Love has different aspects - romantic love may be the first to spring to mind, but there is motherly, fatherly, brotherly love. Sometimes, it seems like we can love in one direction. We can love a person, top of the range car, or mobile phone without being loved back. But love is also something that exists between people - a couple being in love with each other or love within a family - which is far more complex than just an internal one way emotion.

Love is not just a set of activities.

Innovation?

“How do you do innovation?”

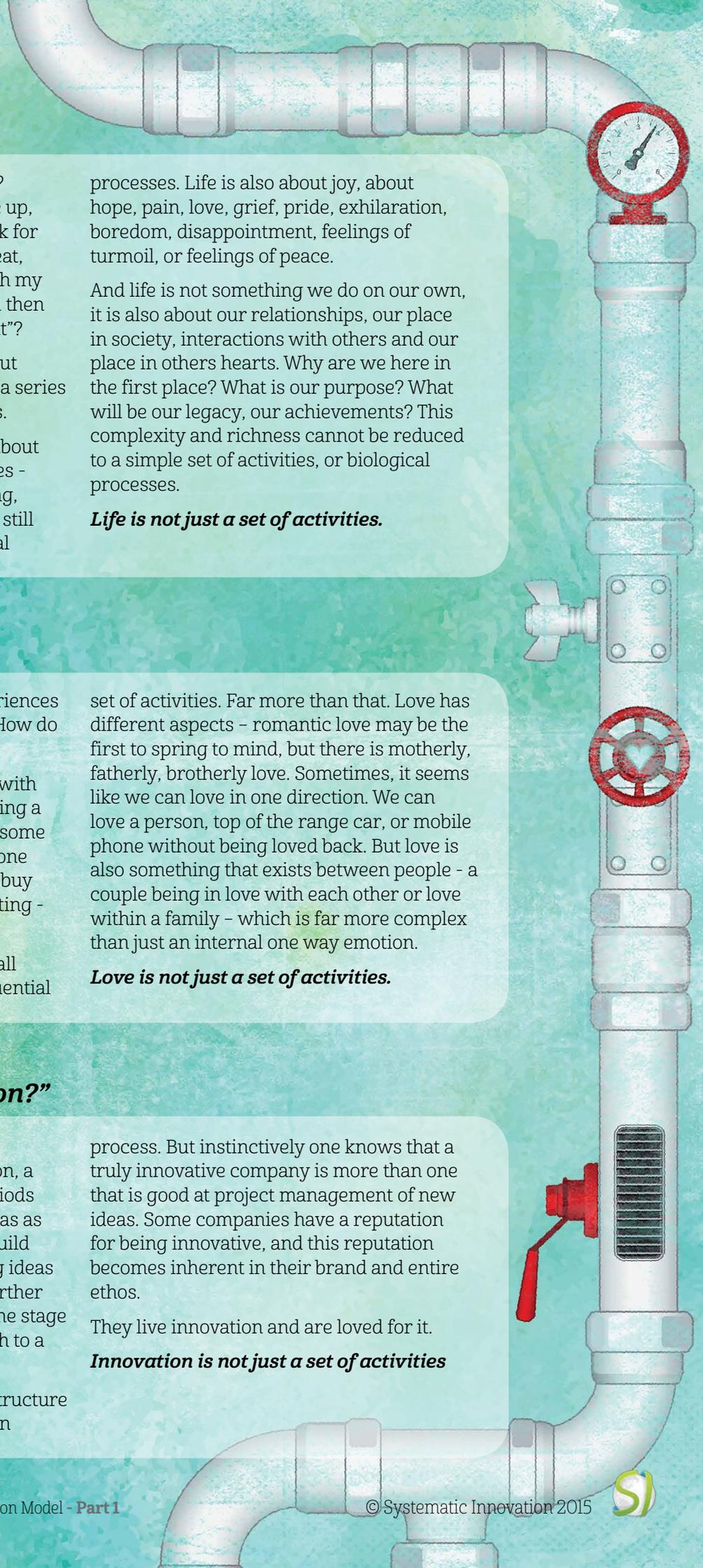
If you ask most managers about how innovation is done in their organisation, a typical answer may be - “we have periods of ideation, where we get as many ideas as we can, then we filter, combine and build on them to create a body of competing ideas that after screening go forward for further development. The best ones get past the stage gate filters set by strategy and through to a launch gateway and implementation”

Most companies have a procedure / structure for managing this step wise innovation

process. But instinctively one knows that a truly innovative company is more than one that is good at project management of new ideas. Some companies have a reputation for being innovative, and this reputation becomes inherent in their brand and entire ethos.

They live innovation and are loved for it.

Innovation is not just a set of activities



So what?

In this metaphorical experiment, we took life, and love, and in each case we made an internal construct or mental model of each - the “what” or noun. This in turn led to a narrow and limited description of “the how”, the verb.

Imagine being appointed CLO - Chief Life Officer, responsible for improving life performance. If your mental model is that life is just a set of activities - you are likely to approach the improvement challenge by simply looking to improve the effectiveness of those activities - i.e. a shorter commute, higher salary, more evening entertainment time, new hobby and maybe a better work / life balance ratio. As all of these things are easy to measure, it would be simple to report on and track progress, maybe even set some goals, targets to benchmark and bonus. You would then be able to report on your improvement. But although these kind of metrics are undoubtedly helpful and give an indication of life performance or satisfaction, they could actually be limiting, or even misleading. We might for instance prioritise a less fulfilling job role in favour of one with a shorter commute or higher salary. We know that life satisfaction is more than metrics such as salary or commute time, and this way of thinking is limiting.

The central question of this article is whether we do the same thing with innovation. By having a limited mental model of “the what”, do we limit our understanding of “the how?”

As a Chief Innovation Officer CIO - your brief is almost certainly to “improve innovation performance”. So, if we only think of innovation as a sequential set of idea management activities, do we then limit ourselves by managing innovation only as a sequential set of idea management activities?

In our experience, the answer is “mostly, yes”. It is what we see organisations doing all the time, looking for more ideas, better ideas, better filters, more efficient teams, better inter departmental interfaces, more patents per person, better consumer insight, faster ideation, higher success ratios, faster implementation and so on. All of these aspects are good, essential even, but they are mostly about the activities at an operational level.

Instinctively we know that innovation is something far deeper than this. We know that innovative companies have a legacy, an impact on society, something about them. It is like they have a life. But the sequential, ideation centric mental model of innovation tends to stop us seeing it that way. Why? Maybe because we only manage what we measure, and what we measure is

based on what is easy to measure, and the metrics we choose are based on a model, and that model is limited.

The problem then? We need a better, or at least different innovation model.



A better Innovation Model

A world leading automotive component manufacturer was considering the use of TRIZ¹, and set up a research programme with the university of Bath. The research question was in effect - does the introduction of TRIZ improve innovation? The approach was to measure innovation performance before and after implementation of TRIZ.

1 TRIZ Teoriya Resheniya Izobretatelskikh Zadach, literally: “theory of the resolution of invention-related tasks” or “the theory of inventive problem solving”

Genrich Altshuller (1926-1998)

In keeping with the companies Six Sigma practice of Define, Measure, Analyse, Implement, Control (DMAIC), it was required to define innovation, and how it happened as a process in order to study and measure it. At the same time, PhD student Tom Howard was completing a thesis on the creative design / innovation process and had conducted a very thorough literature review of the subject. In summary, this review suggested that the vast majority of models break innovation into :

- 1. Define your problem / needs**
- 2. Think up some ideas (ideally as many, and as creative as you can)**
- 3. Choose the best one (or combination thereof)**
- 4. Implement**

Often, represented as a funnel:

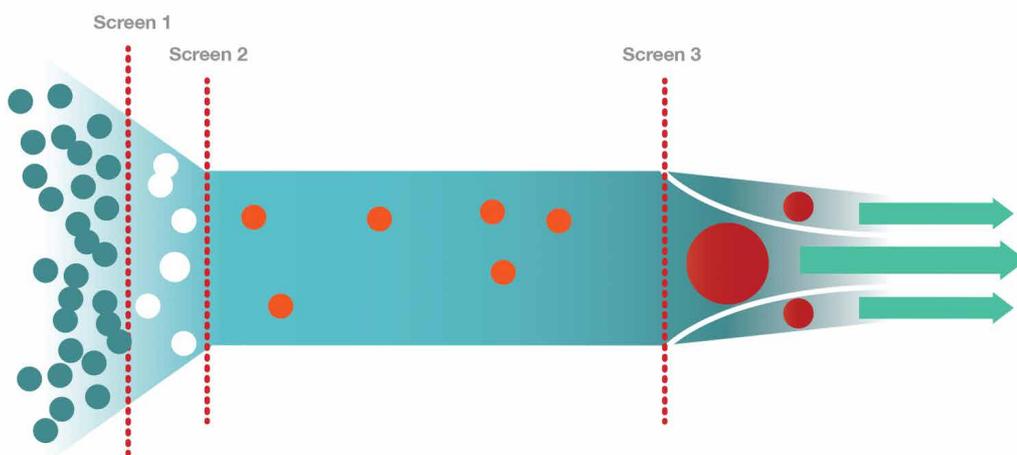


Figure 1 - Innovation Funnel (ifm.eng.cam.uk)

The double diamond model developed by the UK design council is also well used.

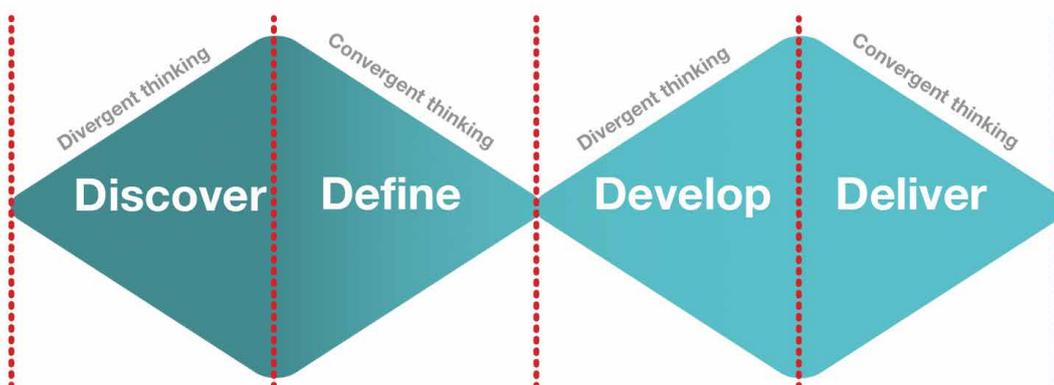


Figure 2 - Double diamond model - Design Council UK

The message is that in general, the worlds mental models represent innovation as a sequential set of activities. Because the TRIZ methodology is focused on the thinking processes of inventive problem solving - the how - prevailing models seemed lacking and this is where the quest for something better began. We needed a suitable non sequential model and as this appeared missing in literature, we needed to develop our own. We decided to use the slightly obscure Integration Definition for Function Modeling - IDEF0 which is non-sequential, and has the added advantage of being hierarchical so we could explore to any level of detail necessary.

(see www.IDEFO.com)

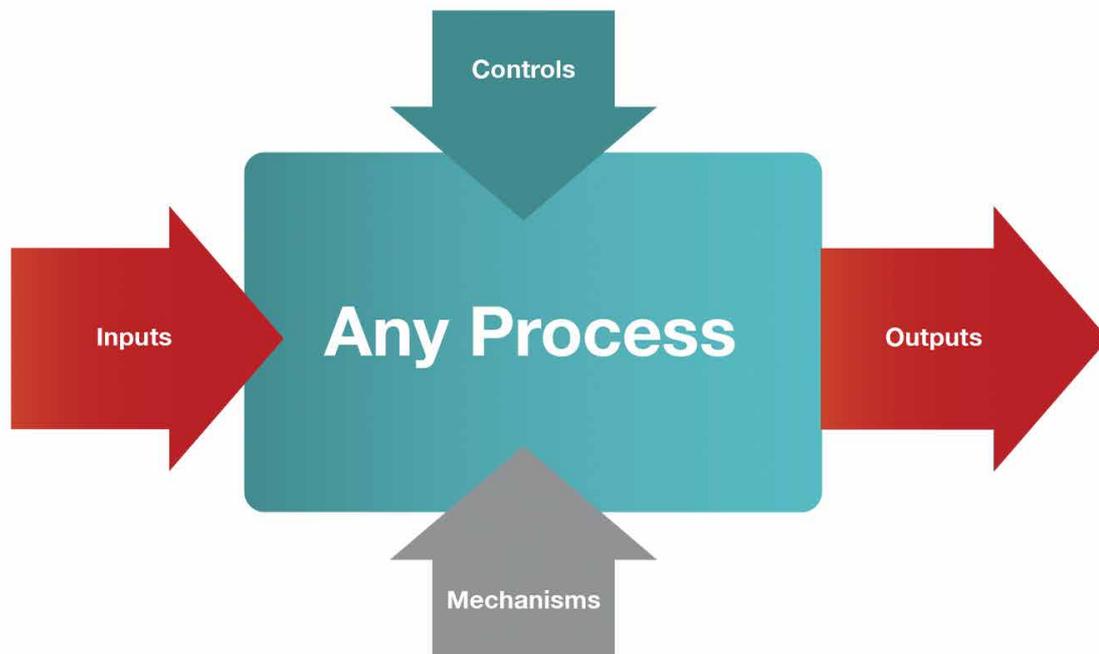


Figure 3 - Generic IDEF0 ICOM box and arrows Inputs Any Process Outputs

IDEFO suggests that any verb is a process and can be modelled in an extremely disciplined and structured manner. Despite being fuzzy and ill defined, Innovate is a verb and is therefore suitable for this approach, allowing us to apply the discipline and rigor of a structured system design tool to the woolly world of creativity and innovation.

The heart of IDEF0 is the ICOM box. A process has to have Inputs, Controls, Outputs and Mechanisms which are shown as arrows. Both the box and the arrows can be decomposed into sub system levels - sub processes, and sub arrows. For this article we will concentrate only on the top level.

The next part of this article takes you through the reasoning of how we applied the ICOM process definitions to innovation.

Inputs

IDEFO definition *Inputs are transformed or consumed by the function to produce outputs*

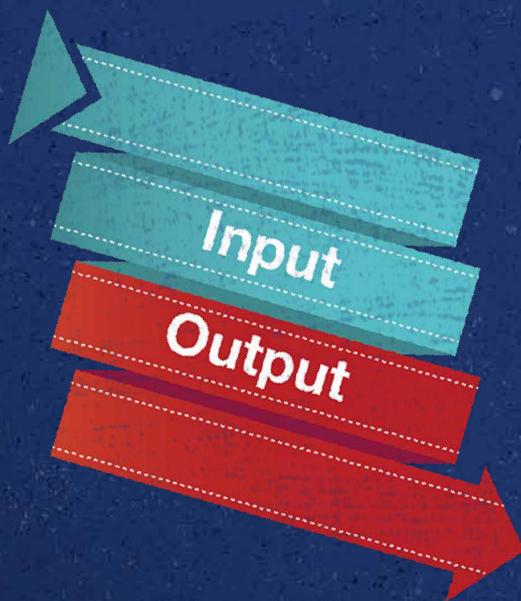
We know that money is consumed by the innovation process. If there is no money, there is no innovation. This is clearly an input.

We observed and interviewed the most innovative engineers in the business, and found that when faced with difficult design problems, they dip into their experience, or the company knowledge base to look for similar elements of previous work. Or they looked for resources outside the company that they could use or adapt to their situation.

When one looks at the patent database, you see that technology develops by building inventive steps – with one technology building upon the previous “state of the art”. When you write a patent, it is advisable to look to what is already out there to ensure you are going into new “white space” territory. There is a sense that you have to look backwards to move forwards.

As a solution finder, you can only base your thinking on the information that is available to you. Some knowledge is always hidden, and that hidden or unavailable knowledge therefore cannot be an input.

The conclusion was that the second input to innovation is available knowledge, including IP.



Outputs

IDEFO Definition *the data or objects produced by the function*

One would perhaps expect that the primary output of innovation would be the finished, implemented new products or services themselves, in the market place. But let us consider a service innovation, such as a novel insurance product. Deployment of that new service simply requires deployment of a new set of encoded instructions to sales, administration and support teams. Although some physical things happen in ‘real life’ – such as phone calls and posting of new contracts, the “innovation” is encoded in the companies documentation and operating instructions. It is this new knowledge base that results in the new service innovation. When you see an impressive physical product innovation, such as a 747 jet aircraft, one sees the physical object itself, but in a wider sense, that object is the embodiment of a myriad of ideas and decisions encoded in Boeing and its suppliers design and manufacturing information systems. It is that new knowledge base that results in the outcome of a new plane.

So we concluded that the objects themselves would be captured in the IDEFO model at a lower hierarchical level. We decided that one output must be the new knowledge and of course the IP resulting from innovation.

Many studies emphasise the link between innovation and economic growth, and therefore, if innovation is being done well, we expect that the input money, is turned into more money, or added value. The term value is important, because this helps to give a sense of the intangible outcome of innovation. It isn't all about money.

Originally, the research was based around a for-profit, automotive component manufacturer, and so the emphasis on the money is understandable. But looking at this again in 2015, and having been involved in innovation in non profit organisations, the overarching term that makes the most sense is “impact”. If you are a non profit organization, you are looking to make the maximum impact on the needs you are addressing, and this equally applies to a money making enterprise too.

So the two outputs of innovation are new knowledge / IP and Impact / added value (£)



Mechanisms

IDEFO Definition *the means that support the execution of the function*

We identified three mechanism arrows. Firstly, people. Innovation does not happen without them. Secondly, people need infrastructure to work with and within. And thirdly, they need tools and methods to structure and organize activities and make them efficient.

Traditional funnel / pipeline type models fit into the mechanisms category. They are methodologies or tools that support the execution of the innovation process. They require infrastructure to support them, and people to conduct them. TRIZ fits here too, as do any other systematic methods or toolkits such as six thinking hats or six sigma.

Controls

IDEFO Definition *those things that specify the conditions required for the function to produce correct outputs*

We concluded that the innovator has to balance the “voices” of the customer and the voice of the system / technology – the laws of science. Often these voices are contradictory – with customers pushing performance expectations past the limits of existing product or system capabilities. These challenges are the drivers of new technologies and product families.

It is also clear that innovation has to satisfy the needs and objectives of the business itself - the strategic goals and direction that the organization would like to go, including fulfilling legislative or CSR (corporate social responsibility) requirements. This also includes strategic objectives – to outmanoeuvre a competitor, enter new markets, license rather than make, be a fast follower rather than first mover. Business should see innovation as the way of achieving its top level objectives.

The controls of innovation are the voices of the customer, the system/technology and the business.

And this allows us to draw the top IDEFO model of the innovation process

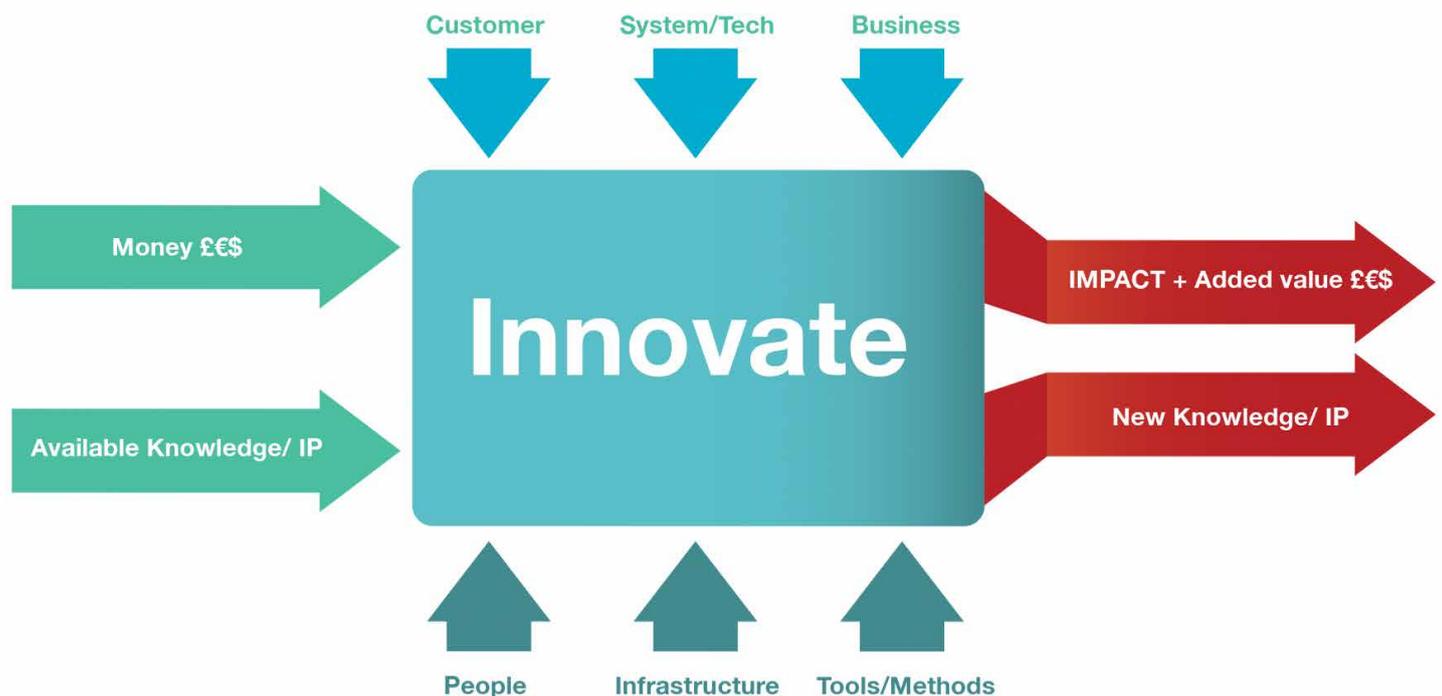


Figure 4 - IDEFO ICOM model of Innovation



So - What does this mean for me?

Essentially, it means we can take a helicopter view of the entire organization and see the arrows as strategic levers to be controlled and managed according to the specific needs of the business. This way of looking at the innovation process provides a different perspective which leads to some interesting insights.

If you want “out of the box” thinking, isn’t it best to work out what the box is?

The importance of knowledge.

As the primary input to the innovation process, knowledge and knowledge management should be given great weight. We also emphasise the word “available”, which suggests that as much useable knowledge as possible should be made available to innovation teams - it means uncovering hidden knowledge where possible and challenging the accepted wisdom.

Reflecting on real-world experience across many industries and organisations we find things lacking in this regard. Brainstorming workshops are viewed as the heart of the innovation ideation process. (step 2 of the step wise view on page 4), and the rules of brainstorming emphasise the need to have an open mind, no preconceptions and suspended judgment. This serves to downplay the importance of bringing previous work, or existing knowledge into the ideation environment - it is implied that it inhibits free thinking “outside of the box”. In order to give teams something more to go on than a blank whiteboard or set of post-

its, recent approaches use the addition of stimulus into creative sessions. These stimuli tend to be purposefully generic and not based upon specific industry context, to encourage free unconstrained thinking. We do understand that in order to create new things we need to be able to release our minds from the past, but we find that this most popular approach results in a lot of wasteful reinvention. There are better ways to achieve this outcome, which is exactly how we believe TRIZ should be used.

It is not uncommon for teams to have far better access to knowledge from outside of their organization - through on-line resources - than internal knowledge management systems, technical libraries or worst of all, file servers! This is seriously inhibiting innovation across many many companies. The challenge therefore is to find better tools/methods to handle available knowledge and better ways to be creative, without constraining thinking or drowning in data.



Balancing the Voices

The three controls / voices of innovation neatly fall into the generic professional disciplines. Marketing, technology and business. Our impression is that most businesses drive innovation through the marketing and/or technical / system routes. But if innovation activities are only driven by one of these teams, then there will be a natural tendency to over-emphasise one over the other, and risk achievement of the best overall outcome. The challenge here is to recognize the effect of over reliance on just one of the controls and put in place measures to get the right balance.

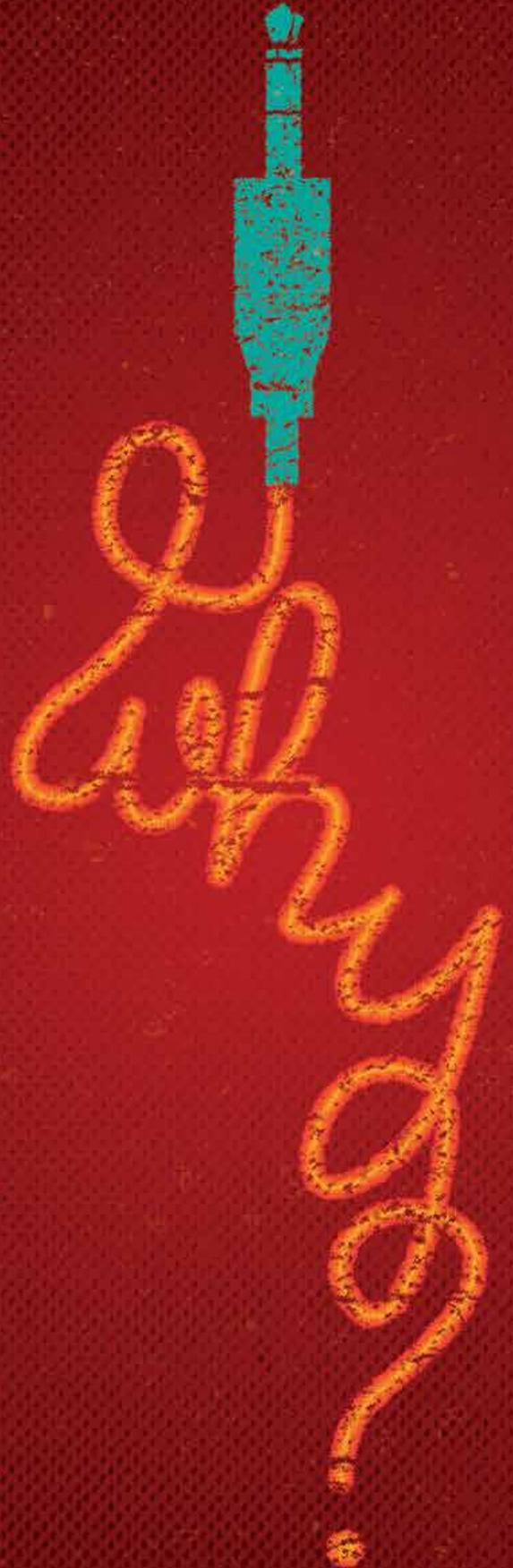
In practice, we observe that in common with academic disciplines, most companies reporting lines, physical spaces and working practices serve to emphasise the gaps between these controls/voices and are very difficult to bridge without significant reorganization. (often referred to as silos, we think of them as tribes). Even external consultancies and agencies tend to be categorized down marketing / consumer or technology lines. Very few offer both, or if they do are good at both.

However we think that sensible cross functional cooperation and project-based team working are achievable ways to get a better balance in most organisations.

A further observation is that companies tend to drive product or service development initiatives either through the consumer led or technology led routes – and they can be very loud voices. The voice of the business tends to be somewhat difficult to hear – concentrating instead on directing its loudest clearest messages towards business operational improvement.

TRIZ tells us that innovation occurs when we solve a contradiction, or conflict. These contradictions can often be addressed within the relevant organizational discipline / tribe. But what about when the conflict exists across departmental lines? For instance the emerging consumer need for relatively simple addition of 3.5mm aux jacks, or USB sockets in cars must have been known for a long time before they were very belatedly implemented in production. The reason is almost certainly because the requirement driven by the fast moving electronics industry spanned the departmental boundaries of car companies who were incapable of reacting quickly enough – with the resulting high frustration levels in iPod and mobile phone wielding teenagers around the world.

We wonder if innovation was seen as being driven and owned by the voice of the business, cross silo barriers would be easier to bridge and the consumer and technology voices may achieve a more natural balance.



Tools/methods – not that important?

Tools and methods such as Six Sigma, QFD, Brainstorming, Lean thinking, Kansei, Value Stream Mapping and even TRIZ are often promoted as being the solution to innovation problems. But it should be clear from the model, that without integration and balance with the rest of the arrows, tools and methods can only have limited impact. This is especially true if people are not led and managed well.

Implications for People

This view of innovation challenges business to increase knowledge through recruitment of people from outside their industry, to educate existing people to know more and encourage them to share information widely. We need to include people with deep knowledge of current technologies in ideation, but also get them to work well with the free thinkers normally associated with creativity and innovation.

We need to mix up marketing and technology – move people between. Form multi disciplinary project teams, and clearly share the strategic goals of the business, integrating these into the objectives of innovation programmes from the start.

We need to support teams with infrastructure that encourages all of these things, and especially, the use of effective IT systems that efficiently capture and enable sharing of knowledge both during and after innovation programmes are running.

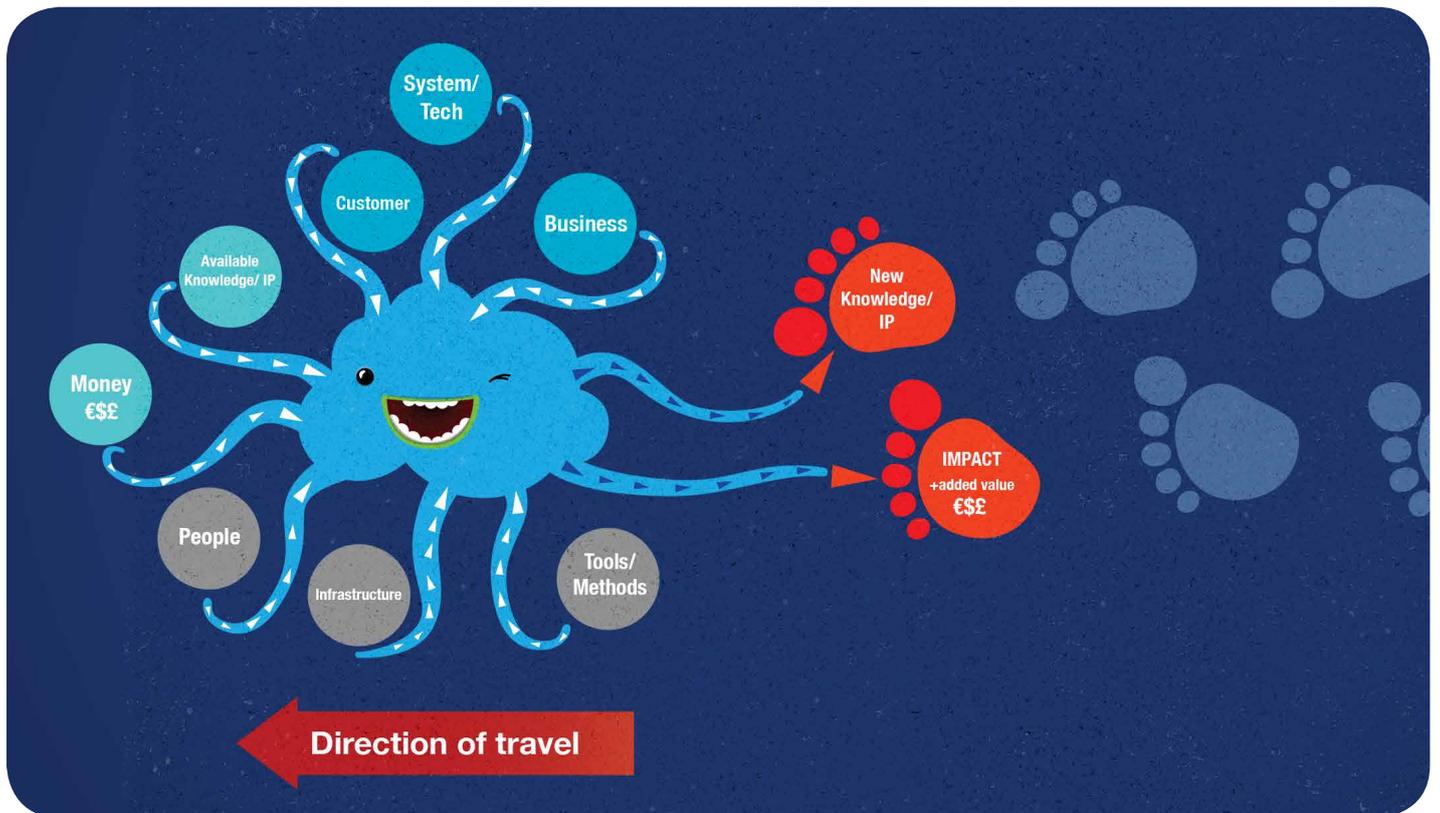
But do the metrics, incentives and targets given to managers and staff reward these behaviours and outcomes, or do they actually hinder them?

That is a big question, and is addressed in the life's work of Prof Theresa Amabile. Her team at Harvard cautions that extrinsic motivators (measures / targets / bonuses) are often accidental inhibitors of creativity and work performance.

When small, innovative companies are bought by large corporate multi nationals with vastly superior infrastructure, tools, methods, funding and marketing clout, their innovative spark is usually snuffed out. This represents a massive waste and loss of value, but also a massive opportunity if companies actually get innovation management right. There are valuable case studies in this area that reveal valuable clues as to the potential for large organisations to be far more innovative.



Measuring Innovation Impact



At systematic Innovation we find that almost without exception, anything needing to be measured has both tangible and intangible aspects. Usually, it is the intangible world that matters most, but the tangible that is easiest to measure. We will start with the easy one.

Tangibles

Imagine that innovation is like an organism living in an eco-system, feeding on knowledge and money, and reacting to and creating an impact on its environment through the changes it makes to what it knows and how it does things. Innovation is how the organism adapts, grows and survives. The important insight here is that strategic innovation is as much about the way you do business as the business that you do. It isn't just about the "innovation pipeline" of new product or service introduction, it also about the effectiveness of the operation of the business. We will look at this in more depth in part 2, but for now, the main point is that innovation and operation of the business are part of the same thing - despite the vast majority of companies being organised as if they were completely separate.

To measure tangible innovation performance then, one has to answer questions such as how much impact you have made on the bottom line, your competitors, your customers input costs and so forth. In healthcare, your desired impact could be reduced infection rates, reduced mortality, increased life expectancy. In non profit, it might be numbers of immunised children, number of water wells or counselling sessions completed.

Every organization will have a long list of tangible, measurable parameters of value that are relatively easily calculated or quantified in some way, often with ratios attached. But the primary measure of added value has to be profitability.

The amount and quality of new knowledge and IP can be measured, and valued. In today's big data driven world - these type of intangible outputs are almost considered tangible

In the early, metaphorical part of this article we considered innovation to be like a life well lived. In our imaginary role of chief life officer earlier, we defined life as sequential activities - an operational model. This then led us to a set of measures such as salary, commute time, work life balance ratio and so on. But these things don't really figure when we consider our legacy - "hey, they had such a great salary, or work life balance". People are remembered for the impact they had - serving a community, constructing exceptional buildings, entertaining people, serving a regiment, curing a disease, inventing a great product, writing a book and so forth.

Our companies also leave a similar legacy trail. We talk about a carbon footprint, we should also think about our innovation footprint, except that our innovation footprint should be as big and as deep as we can make it. Or in the words of Steve Jobs "To make a ding in the universe". This is a measure of power, or capability. A powerful animal makes a big impact and a deep footprint, or a big ding. A powerful innovator should do the same. Innovation capability can be thought of as innovation power.

The 100 Most Loved Companies: 1 to 25					
Rank	Company	Emotional Linking Index (0-100)	Rank	Company	Emotional Linking Index (0-100)
1	The Walt Disney Company	74.7	13	HENSHIEYS	72.0
2	YAHOO!	74.3	14	Coca-Cola	71.6
3	Google	74.2	15	DELL	71.0
4	SONY	74.1	16	SHARP	70.8
5	NESTLE	73.3	17	PEPSICO	70.6
6	Auchan	72.9	18	NIKE	70.6
7	WALMART	72.8	19	hp	70.5
8	WHOLE FOODS	72.7	20	COSTCO	70.5
9	LOWE'S	72.7	21	Target	70.4
10	Microsoft	72.5	22	amazon	70.4
11	Kellogg's	72.1	23	GENERAL MILLS	70.3
			24	THE HOME DEPOT	70.3
			25	IKRA	70.1

Intangibles

But there is also something intangible about someone's legacy - about how they were or are loved - (which is why we brought that up). It is not just what they did, but how they did it, what they were like, their personality. Companies are loved. Marketing and advertising have a lot to do with how well a company is loved, its branding. But consumers love brands built through consistent experience of great products / services, delivered to them in a great way. It is a whole company thing, and inherently linked to strategic innovation. There are many measures for how a brand is loved, and are often ranked in on-line articles - like "the top 100 most loved brands (and the most hated)" - mostly opinion surveys which are interesting but not very useful.

But maybe there is a simple way to think about this. When we lose someone we love, we miss them. And the more we love them the more we miss them. So perhaps to get an impression about how much we are loved we should ask "how much would our company be missed if we weren't here any more". Imagine a world without Disney, IBM or Unilever. If your company unlaunched all its products / services, un-invented its IP portfolio, destroyed all its documentation and wiped the memory of all of its staff and computers, what would be the impact to your industry and consumers / customers? How much would you be missed? What would be the impact? How could this be measured?

We also mentioned that love isn't just in one direction, it is something that is built between people. Maybe instead of only asking how much our customers love us, we should also ask how much we love our customers. If we really do care for them, we will want what is best for them, anticipate their needs, want to understand them and serve them in an engaging way, go the extra mile and have great experiences together. And if they love us back, we will reap the tangible rewards too.

So, as we usually find, intangibles are essential to understanding and measuring performance. Perhaps, an inability to measure and understand intangibles is the reason researchers and managers become fixated on the tangible, more measurable parameters.

Part 2 will expand on this area, and go deeper into the IDEFO second level, but for now this seems like enough to be thinking about and we hope it has given pause for thought.





*“I want to put
a ding in the
universe”*

Steve Jobs

In Conclusion

- **Innovation is not a pipe, or a funnel, it is a whole company verb / process at the strategic level.**
- **Do we conclude that all the typical sequential models of innovation are wrong? No, they can be extremely helpful. We just think that they are limited, and therefore limiting.**
- **The IDEF0 top level model allows us to grasp innovation as a whole, creating a canvas on which to place the elements to be coordinated and balanced, making the biggest impact.**
- **There is a significant opportunity for organisations to increase innovation impact by revisiting how they organise themselves, and improve innovation capability.**
- **There is an important intangible aspect to Innovation which is little understood, and offers great untapped potential for innovation managers.**



Paul Frobisher September 2015

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(This is not an exhaustive list - but some of the key influences on this work)

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