

LEADING INNOVATION THROUGH DESIGN

2012 INTERNATIONAL DESIGN MANAGEMENT RESEARCH CONFERENCE
AUGUST 8-9 2012 - BOSTON, MA. USA

Author Name(s) (2013). Paper Title. XX – XX

WORK-WELL: CREATING A CULTURE OF INNOVATION THROUGH DESIGN

Joseph LOCKWOOD^a, Madeline SMITH^b and Irene McARA-McWILLIAM^c

^aThe Glasgow School of Art; ^bEKOS Ltd; ^cThe Glasgow School of Art

Abstract

'Creating Cultures of Innovation' is a unique design intervention project that works with Scottish businesses to explore how to apply design approaches to transform in-house innovation capacity, boost employees' use of skills, increasing motivation and productivity and providing creative leadership to support collective solution generation. Our research was developed from the findings of the Cox Review (2007) which defined '*Design... that which links creativity and innovation.*' Therefore, our hypothesis was could design act as a vehicle enhance and embed innovative capability in SMEs. This paper is a case study of our work with a Scottish company and our collaboration to understand how we might build the capacity for *sustainable innovation*, where creativity is permanently embedded in flexible, multi-disciplinary teams.

We will discuss key findings exploring and explaining the methodology, approach and give a general insight into how this case study furthers our understanding of how organisations build up resources for innovation. Integral to this is an understanding of how we make effective use of established knowledge, insights and expertise, and liberate (or at least tap into) knowledge, skills and competences that reside within firms. (Paton & Karunaratne, 2009)

Key Words: Creativity, culture, innovation

INTRODUCTION

Design Innovation

Innovation, the successful implementation of new ideas, is an important driver of economic growth. Successful innovation creates customer value through new products, services and processes, giving rise to new markets and economic growth, as well as contributing to higher productivity, lower costs, increased profits and employment. The central role of innovation in creating future prosperity and quality of life is widely acknowledged and accepted. The OECD Innovation Strategy (2010) highlights that innovation drives long-term economic growth, and states that:

Innovation ...has long been viewed as central to economic performance and social welfare and empirical evidence has confirmed the link between innovation and growth. This means that all governments must understand the importance of innovation, and develop policies to strengthen its efforts and outcomes

^a Joseph Lockwood: Centre for Design Innovation | The Glasgow School of Art
Horizon Scotland | Forres IV36 2AB | Scotland
e-mail: j.lockwood@gsa.ac.uk

Copyright © in each paper on this conference proceedings is the property of the author(s). Permission is granted to reproduce copies of these works for purposes relevant to the above conference, provided that the author(s), source and copyright notice are included on each copy. For other uses, including extended quotation, please contact the author(s).

Innovation is at the heart of European and UK economic development policy, and is a major focus for investment across the UK. In addition to its growing importance and profile, innovation theory and policy has also evolved in line with developing thinking about the scope and nature of innovation in a modern economy. The linear model of innovation through science, R&D and technology development has been augmented through the exploration of open innovation models, the importance of the creative economy and interdisciplinary approaches. NESTA were at the forefront of exploring, and bringing to a wider policy audience, these ideas in the UK. Their publications (Harris & Nightingale, 2006 & Harris & Halkett, 2007) and the resulting discussion highlighted that the traditional view of innovation as a pipeline process based around commercialising scientific or technological invention needed to be supplemented by a broader understanding that innovation is not necessarily linear and reaches far beyond the production of products, involving a diverse range of actors and inputs with different perspectives.

Innovation often comes from looking sideways, to seek ideas in adjacent fields or disciplines, which when abducted into your own domain might yield new insight or combination. This process of combination often relies on people who span different cultures and disciplines and spaces where ideas and people mingle ... Creativity comes from interaction and dialogue between different ideas not just from diversity alone.
(Leadbetter, 2006)

Increasingly therefore innovation is viewed as not merely the domain of the specialist researcher, but an area where everyone has the potential to contribute. Consistent with a broader definition of innovation our work explores its multiple-drivers, social, cultural, organisational as well as technological. Explicitly, within the work of cultures of innovation, we seek to investigate the interface between employee engagement and a capacity for sustainable innovation.

Organising work for innovation...

'To be creative people have to think differently. To be innovative people have to behave differently.' (Vonn Stamm, 2008: 3)

While we see a growing recognition for a broader understanding of innovation, this is not as yet necessarily reflected in our organisational structures, and their innovation strategies, which are the outcome of complex interrelationships many of which can be traced back to influences forged during the industrial revolution. They are characterised by centralized hierarchies, with power coming from the top and delegated down and work organised through a structure of command and control. (Malone, 2004) However, the digital revolution is disrupting and rendering the traditional models for organising work as inadequate to address today's challenge. The 21st innovative organisation not only has to produce a flow of innovative products and services; but also is actively cognisant that they must innovate who they are and how they do things to adapt and learn for survival in an unpredictable environment. As Christensen (2003) says the challenge for companies is to rebuild ships while still at sea. Therefore, it is vital to develop an understanding of how organisations build up resources for innovation and integral to this is an understanding of how we make effective use of knowledge, insights and expertise, and liberate (or at least tap into) knowledge, skills and competences that reside within firms (Paton et al, 2009). To do so firms must loosen reliance on 'Taylorist' principles of organising work and behave dynamically; Malone (2004) proposes a management style, from one which controls to one which cultivates the organization. By this he means to discover and encourage its positive potential and purposely that of its people. We are beginning to see forms of organising work that favour a more decentralised (Malone, 2004) approach which enables interactions between those with diverse experiences and competencies which are arguably more creative when it comes to generating new ideas, while those that delegate problem solving to a wide range of employees may be more successful at turning ideas into new products and processes. For example, the OECD's 2010 report on innovative workplaces found that

in nations where work is organised to support high levels of employee discretion in solving complex problems, the evidence shows that firms tend to be more active in terms of innovations developed through their own house creative efforts.

The need to rethink how we organize work for innovation is led by a technological disruption however; technology only enables change if wedded to people's need and desires. We see growing recognition of the importance of non-economic goals (Malone, 2004:34) and the need to understand the social goals like

creativity, personal satisfaction and freedom in how we begin to reorganize for innovation, to do this we must become mindful of the social fabric[†] of the organisation and recognise culture as a powerful and sophisticated agent (Alvesson, 2005). Furthermore, to unlock creative potential we should take a situational rather than a dispositional view of leadership in order to enable a field of 'creative leadership, by igniting the collective creativity of the organization from the bottom up' (Radjou, Prabhu, Kaipa, Ahuja, 2010). In fact the need to 'take advantage of people's true intelligence and creativity becomes one of the most critical capabilities of successful businesses.' (Malone, 2004:153). Therefore, our research seeks to understand 'a culture of innovation' as a complex adaptive system that have a large numbers of components... that interact and adapt or learn (Holland,2006) in this case we are interested in the components that are the human with all its behavioural vagaries, as we seek to understand what are the methods that could unlock the creative capability and collective wisdom of the group. For as Stacey (2005) suggests, 'innovation is pursued as the novelty that emerges from conversations collaborations in dynamic, non-linear, networked communities.'

Our research was developed from the findings of the Cox Review (2007) which defined 'Design..., that which links creativity and innovation.' Therefore, the hypothesis we were looking to investigate was could design act as a vehicle to unlock existing skills and knowledge to enhance and embed innovative capability in SMEs.

The Small to Medium Enterprise (SME) & Innovation

As stated earlier, successful innovation gives rise to new markets and economic growth, as well as contributing to higher productivity, lower costs, increased profits and employment. These outcomes are critical to sustainable economic development, which is exaggerated in the current economic crisis. Our work is focused on exploring stimulating innovation in a Scottish context and in particular but not exclusively with SMEs. SMEs are a major force behind Europe's economy, constituting more than 99% of all enterprises in the European Union; they provide around 65 million jobs and make an important contribution to entrepreneurship and innovation (European Commission, 2007). While it is recognized that economic growth is dependent on innovation, SMEs in Scotland are often not as innovation active compared to their US and European counterparts and find increased barriers to implementing successful innovation strategies (including information failures, not understanding the benefits, or how to approach the process and being unsure where to get that information). In addition, the SME is significantly more resource constrained than their MNC counterparts. As such they are often more risk averse, being unwilling to invest in innovation activity unless they are sure of the returns.

Cultures of Innovation is a partnership with the Institute of Directors, in order to stimulate demand for innovation we needed be part of 'networked communities' to engage in conversations and build trusted connections. The IOD provided such a respected "business" network.

However the Cultures of Innovation Programme is not a standard innovation programme. We were also exploring and using the engagement with the companies as a fruitful area of Action Research. This was presented as a co-production approach, where design innovation would allow the company to experiment, rapidly test and prototype new innovations. Although the process was structured, there was explicitly not a fixed roadmap of how the workshops would progress. The companies engaged in the programme therefore needed to be able to engage on this exploratory level. The selection criteria were based on identifying the 'curious', that is those who were open to the risks associated with innovation. How those participating described this process:

'Initially we met to decide if there was a potential for marriage. Sometimes the concept of installing innovation can be too radical for some more professional businesses. Similarly, bringing tools and techniques from academia into the real world is not without stress and strain. Our two-way learn-as-you-go attitude was vital in developing the open nature of the program.' Company participant

[†] Social Fabric is here described as levels of trust, shared norms and values, interpersonal obligations and expectations and the shared representations, interpretations and systems of meaning embodied in shared codes, languages and narratives. Kay, N

CREATING CULTURES OF INNOVATION – A CASE STORY

Scott & Fyfe (S&F) are a long established textile manufacturing company. Originally focused on jute manufacture, the company today produces highly technical material in multiple processes. The company had identified the need for an improved new product development process to meet the increasing demands of customers and address the issue of shorter product life cycles. The previous 4-5 stage NPI process was largely reactive, responding to customer enquiries. The CEO, a relatively recent appointment, was interested in exploring ways of initiating new ideas in what was a traditional, family owned manufacturing culture. Consistent with Silverman's (2005) view of qualitative research we worked with a small case, sacrificing scope for detail to provide proof of concept for the hypothesis that design thinking and methodologies could help improve the performance of SME's through building better cultures of innovation. The research solely utilised qualitative approaches and tools to gather 'stories of change', capturing the behavioural changes within the companies involved. Qualitative methods are consistent with our understanding of innovation as a social-cultural phenomenon. *'Qualitative researchers stress ... the intimate relationship between the researcher and what is studied, and the situational constraints that shape inquiry. They seek answers to questions that stress how social experience is created and given meaning.'* (Denzin & Lincoln, 2000:8) The research explored the parallels between learning in the workplace and design methods; they are both a cycle in which experience is translated into concepts, which in turn are used as guides in the choice of new experiences (Kolb, 2004). By using the design methods and approaches as our research tool we tested the creation of a 'learning space' to use content (a strategic objective) pertinent to the partner organisation and apply learning activities (use of capabilities) relevant to the organisation and as such its performance. As such design was the vehicle to help unlock these capabilities within the organisation. The 'learning space' was constructed through the design of a series of bespoke, integrated design innovation workshops for a cross-functional team encompassing a 'diagonal slice' of the workforce. In these workshops design-led activities were employed to facilitate team and individual learning. The workshops would be a 'dry-run' to familiarise participants with a different way of doing things, followed by its application workplace to real business issues. In addition they were encouraged to engage wider than the workshop group to 'ripple' the effect out into the organisation. Data was collected through participant observation and self-reporting during and between the workshop series and the business was asked to create its own internal measures to evaluate progress. In addition, purposeful sampling of participants before, during and after the series was carried out, this work is ongoing as part of a longitudinal study.

Selecting participants for the intervention

Just as we had sought to find the curious at firm level so we sought the curious at individual level. We wished to encourage participants to look 'sideways' (Leadbetter, 2006) to stimulate new combinations and collaboration. Therefore, we asked for a cross-section based on different departments, length of service, gender, place in the hierarchy. In addition, we asked for characteristics such as open, passionate, willing, good communicator.

One of the key learning's to come from the pilot was the importance of selecting the right group at this stage. These individuals need to be motivated, curious and also credible within the rest of the organisation. A 12 member, multidisciplinary team was established taken from a 'diagonal slice' of the company, across all business functions and different levels of staff and management (although not the CEO). A call to action was formulated:

"To grow and secure the business as a centre for excellence in Tayport by creating cross-functional teams which share experience and contribute to how we commercialize NPI."

This sentence was communicated by the CEO to the team of 12 and formed the rational for the Cultures of Innovation initiative.

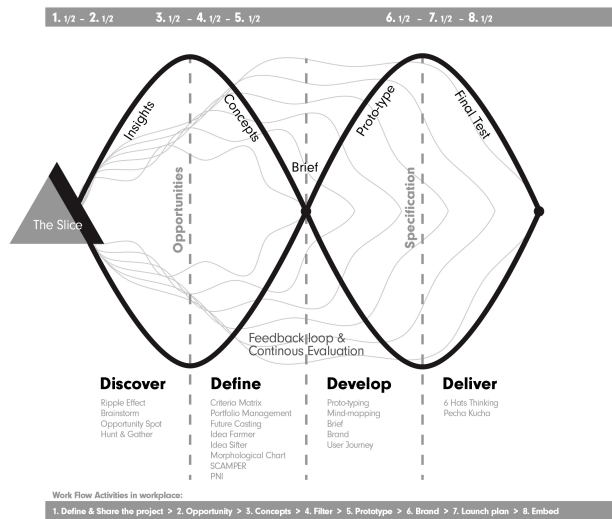
DISCUSSION

Design as the vehicle

Over a period of 8months at intervals of once a month the team underwent a series of workshops with the GSA design team (figure 1), always off-site to enable the team to focus on the task in hand and not be drawn back into day-to-day operational activity. As part of these workshops they were introduced to design thinking approaches (examples shown in figure 1), and allowed to test them in non-work environments, before applying

them more directly onto work related issues, as the *quick wins* and the *slow boils*. They would present progress back at the following workshop. The team were incentivised and allocated time by the organisation for these tasks. During this process we experiment with how to enable a journey in thinking differently and then behaving differently, it is an inclusive and iterative process and we as researchers are learning in this process about what does and does not work. To illustrate some of the experiences over the 8month period we discuss three examples of activities and the subsequent outcomes in the next section.

Cultures of Innovation: Scott & Fyfe's Journey



Unknown
Formatted: Font:10 pt

Figure 1. The Design Intervention programme as carried out with Scott & Fyfe. Overlaid on the Design Council Double Diamond model of the design process

Stimulating new conversations in the organisation

As Stacey (2005) suggests, 'innovation is pursued as the novelty that emerges from conversations collaborations in dynamic, non-linear, networked communities.' Therefore, an opening and ongoing for the team is to create a collective identity and to shape feedback loops in the organisation to engage and communicate with the wider organisation through out the journey, and tap into grass-root activity we call this *the ripple effect*. The name created by the team was NOW, New Opportunities Within, and the NOW team identified a development space alongside the shop floor to enable prototyping of new product ideas, and to make the work of the team more visible and accessible to the whole company including, importantly, the shop floor. Delivering *the ripple effect* was not unchallenging for the team particularly the shop-floor staff. However, the evidence suggests the ripple is effective, with methods being shared with broader group than the original 12, e.g. through self-initiated peer-to-peer learning and in day-to-day operations e.g. shop-floor workers who have a wealth of knowledge of materials and production are contributing, including outside of work, in development projects. In addition, 'cultures of innovation' at Scott & Fyfe is called the NOW process. The *ripple effect* has contributed to a more distributed leadership model with insights and actions on business improvement coming from across the company,

'Innovation is a bumpy road, as you work through this process more and more people gain an opportunity to use the voice they have always had, but never used. As a result more people need to be listened to and

responded to. This increase in the dialogue, leads to in hard honest debate... dialogue is the fuel for our fire'
Company participant

Significantly, an unforeseen outcome of the process was Scott & Fyfe's decision to convert the old Jute mill, which sits at the centre of their factory into an open studio for project-based working.

Encouraging learning from prototyping

Business is uncomfortable with failure, however successful innovation relies on experimenting and learning from failure, if your organization can adopt the concept of '*intelligent failure*' (Sitkin, 1992), it will become more agile, better at risk taking, and more adept at organizational learning. To nudge this thinking we facilitate a design workshop called *the marble run*. The purpose is to encourage a prototyping mind-set allowing the team to begin to learn how to fail fast without wasting time, money or resource. We set the teams the challenge of building 3 versions of a marble run; which become increasingly difficult, are time constrained, and we celebrate the greatest failure. Our aim is to illustrate, prototyping can take many forms allowing you to create variations of an idea to test before further development without wasting any expense or time but delivering great insights.

"We used to see the failure to complete or develop a product as a bad thing, even if it was not commercially viable, we just couldn't fail! Through our collaboration with GSA we have learnt that it is better to realize faster that a product does not warrant continuation, allowing us to divert resource to another product that has a better chance of success. Failure is not negative as long as it is recognised quickly. Learning from 'fast failure' helps evaluate potential solutions before processing the final product, therefore have a better chance of developing faster and more successfully. We do not waste time and resource on projects with low success rates. "
Company participant

Fostering greater collaboration and new combinations

As to be expected business function and information silos prove to be a constant stumbling block for the team, with inherent tensions between sales, production and development. However, the fundamental building blocks of an *innovation system*, involve the connections between the components that ensure the flow of information necessary for innovation to take place (Metcalfe, 2007) how do we start to break down barriers and increase connections. We introduce simple visual tools such as mind mapping, as a way to make thought processes explicit, encourage collaboration and reveal hidden knowledge. In addition, we introduce de Bono's 6 Hat thinking (1999), as a way of encouraging the team to carefully think together and to be conscious of different contributions and perspectives. Over the course of the programme, the team use both methods to change the perception and dynamic of these tensions. For example, there is a long-standing problem with machine time for sampling, production runs the machines and are reluctant to stop production to test development products. The team decide that they need to get the two sides together, also evidence of the ripple approach, and facilitate a solution-focused discussion on how to satisfy the needs of production and development. Several discussions and many mind-maps later production and development are working cross-functionally to deliver goods on time and space to experiment with new products. A similar approach is taken by the team to address the silos that exist between sales and development; where there is not a tradition of sharing knowledge and insights with colleagues resulting in missed opportunities, limited market focus and misunderstanding customer needs. Cross-functional working, learning from prototyping and distributed leadership have currently contributed to 50 new products ideas and 10 new products in development.

"We have shop floor operators who have set up their own innovation blogs, completed market assessments to select our new French distribution and designed a marketing campaign for a key market segment. Such is the power of Embedded Innovation." CEO Scott & Fyfe

THE LEGACY

'Significantly, the intervention has left a legacy of on-going development activity, with the innovation team at ... becoming permanently embedded within its everyday practice.' SKOPE Evaluation

It would be foolhardy when looking at 'culture' to think that we can isolate the changes at Scott & Fyfe just to their participation in cultures of innovation, as we have stated ourselves organisation are complex and dynamic system that involves multiple interactions and components. At the time of our collaboration with S&F there were multiple interactions at play that shaped the transformation of business, this is as it should be. However,

table 1 illustrates there has been a considerable shift in how S&F describe themselves and the approaches they take to organising work towards a culture of innovation.

Table 1: Observations and reflections on the characteristics of the organisation during the process.

<p><u>Who we were:</u> Reliant on customer enquiry No market insights Information silos, not shared No 'stop' button Ad hoc & unfocused development Top down leadership</p>	<p><u>Who we are becoming:</u> Insight gathering Opportunity spotting Cross functional activity Learning from prototyping failures Strategic development Distributed leadership</p>
---	---

Crucially, the NOW approach has led to a redesign of working practices across the company. Prior to this S&F had a traditional, hierarchical and function based organisational structure as illustrated in figure 2.

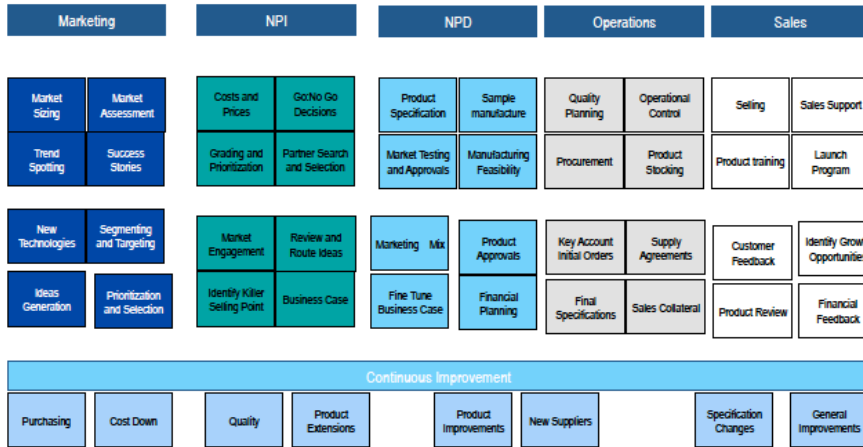


Figure. 2. Scott & Fyfe organizational structure before, traditional hierarchy & functional silos.

There are now four 'Pods' (figure 3) operating as separate and independent business units, responsible for making profit, dealing with its own budget and coming up with new business. They are supported by an ideas generation process, called the 'Innovation Cloud' which uses many of the NOW tools to generate new ideas; these are then taken forward by existing or new Pods as appropriate. The overall process is overseen by an Innovation Executive who ensure that the Pods are all on track and identify and tackle any problems. In addition support functions finance, technical and sourcing work across all the Pods and deliver services as required. S&F new structure can be seen as decentralised, a network of components and interactions.

As such the company has redesigned its operating structure to reflect the change in its way of working. This suggests the change is truly embedded, and provide evidence that this is more likely to be a sustained and not a temporary change.

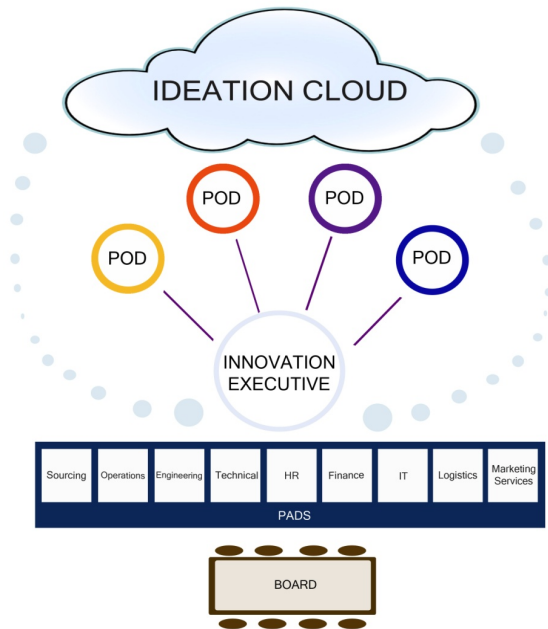


Figure 3. S&F organisational structure post intervention, decentralised with project based business units

“Before, Scott & Fyfe was like an old Bentley on a journey to somewhere new and exciting it had never been before. With reputation and success in the past, the only problem was we hadn’t had a service for a while, we kept running out of fuel and we would take the wrong turning and direction at times. Having had a service, a full tank of fuel and a built in Sat Nav we are now on the journey with a clear direction ahead. We also have breakdown recovery with supportive tools to help us on our way.” Company participant

It is worth noting that the journey itself was not always easy. There were challenges as new ways of thinking were developed, challenging conventional models and ways of working within the organisation. In addition, even when the group was collectively agreed on a course of action, selling it and convincing the rest of the organisation was a challenge, including the CEO. The innovation journey is not linear; it is often random, iterative with periods of extreme uncertainty. Participants describe ‘light-bulb moments’, or moments of clarity, when the applicability of the learning suddenly makes sense and becomes relevant to the work context. Other such moments highlighted a realisation of the role that they themselves had in developing and maintaining a certain culture, or way of working, and thus the role that they now realised they had to play in the change process. One of the key elements in changing behaviours in the programme was exposure and awareness of a different way of working. The design thinking approach builds in time to experiment and prototype rather than a rush to action, which was the modus operandi for many SMEs. Taking time to explore, research and test potential solutions, and the concept of ‘fail faster’ were highlighted as key learning moments. The design process also encouraged the teams to think about the whole process and the impact of a decision upstream and downstream rather than just the immediate impact. By testing and trying new tools in a safe environment, away from the immediate pressures of the workplace, confidence was built which allowed the creative, solution-focused mindset to deliver some inventive results. This differed to the problem-focused attitude that was the norm, where every challenge is immediately raised as a barrier to success. The case prototyped the methods and techniques of design innovation and has proved successful; with Scott & Fyfe successfully developing and implementing a new approach to new product innovation. This includes a redesign of working practices across the company. This has, in effect, changed the company approach to innovation to fully integrate design innovation as core to their business. The CEO described this as ‘embedded Innovation’. This radical change in structure, demonstrates a fundamental understanding that the organisation must not only innovate products but also itself; perhaps Scott & Fyfe are learning how to do ‘to rebuild ships while still at sea’ (Christensen, 2003) through design.

"We couldn't unlock the door to innovations, as we didn't know where it was. Now we have identified the door and we have the key." Company participant

CONCLUSIONS

What is a culture of Innovation: *'It's a freedom of thought, freedom of speech and freedom of action. It's imagining tomorrow and making it happen today, safe in the knowledge that we are dynamic, empowered and flexible to adapt, once the future unfolds. In essence we were shooting for an oxymoron organized right-brain thinking.'* CEO S&F

We set out to investigate could design act as a vehicle enhance and embed innovative capability in SMEs. Our method was founded on an understanding of innovation, as non-linear concept which recognises the importance of creative, interdisciplinary approaches and that it is actions are wider than just new products or services. In this context, we took a view of culture as a sophisticated agent, that businesses must recognise in order to enable greater innovation. Design was our vehicle for this journey and our findings make a valuable contribution to the wider innovation debate and in particular to understanding how we stimulate collective creativity, to foster a culture of innovation. We trialled these methods with two other companies, whilst it is prudent to be clear of the limitations of the study and recognise this was a developmental pilot project, we can also draw substantive observations and recommendations. In particular, its contribution in furthering our understanding of the role of employee engagement to innovation and how we might go about shaping both a practice and policy landscape that has a more holistic understanding of how to stimulate sustainable innovation capacity.

Our work highlights that in formulating an understanding of how we transform in house innovation capacity, the experience of the individual is critical. Their behaviour will in term inform the collaborations, interactions and conversations that form the wider behaviour of the organisation. Our findings show that participants have gained confidence to contribute and share ideas, notably as highlighted in this case study they are more comfortable taking risks within an appropriate context and embrace change where necessary. This is supported by improved conditions for collaboration and effective communication; through mixing hierarchies and disciplines the widest possible use of skills within the participants was drawn out. To effectively use the skills of all employees exposing them to different perspectives and environments challenges silos and self-limiting thinking, which has lead to better decision making and engaging in collective problem solving, with a corresponding reduction of perceived barriers between workplace 'silos'. These findings are consistent with more decentralised or discretionary working practices and recognise the importance of the non-economic motivations. Crucially, they reveal the development of a better awareness of their own skills and the capabilities of others, which are contributing, to a culture of continuous learning and career development. In fact, many of the team members have now expanded roles, exploiting the wider capabilities uncovered during the process. Significantly, for the businesses this is leading to greater organisational ambition, thinking more creatively about potential new products, services and markets coupled with greater market awareness, which allows for more effective opportunity spotting. Critically, what we see is more engaged and involved employees who are enthusiastic about the business performance and are motivated to contribute to its success. This highlights the role of distributed leadership, while the traditional concept of a company leader is recognised as important in initial engagement and for on going support. Vital are leaders across the organisation that engage, catalyse change and embed practice; decentralised ways of working are about *'... the participation of people in the making of decisions that matter to them ... roughly the same thing as freedom.'* (Malone, 2004:5).

Importantly, we found that businesses still demonstrated a product-focused approach, revealing often a lack of user focus in the innovation approach. Bringing design thinking skills to the teams helped move the focus externally, improving innovation strategies and potential changes in products and services. The design process also encouraged the teams to think about the whole process and the impact of a decision upstream and downstream rather than just the direct change. A common barrier to innovation is fear of failure. Using design techniques to test and prototype in a safe environment, before taking forward to the workplace allowed the teams to be more experimental and radical in their thinking. This helped them move from a problem-focused attitude that was the norm in the workplace, to a solution-focused mindset to deliver some inventive results.

Although, this was only the initial pilot it has been viewed as a success, not least by those companies engaged in the process in addition it provides us with rich case study evidence to formulate methods and conditions that are mindful of the social-economic nature of organisations in reorganizing for innovation. In addition, it begins

to explore how organisation can become actively cognisant that they must innovate who they are and how they do things to adapt and learn for survival in an unpredictable environment. Consistent with our understanding of a culture of innovation as complex adaptive systems; we see this work as about understanding and establishing conditions in which components can interact, adapt and learn; seeding an ecosystem which can self learn and feed further improvements rather than a generic programme with one-off delivery. A further stage is now underway involving a larger group of companies to increasingly test the hypothesis. In addition the approach is also being used in other ways, for example to work with groups of organisations in particular sectors in Scotland to develop new collective innovative cluster interventions.

Acknowledgements

The NOW Team, Scott & Fyfe. Scottish Funding Council, The Institute of Directors

WORD COUNT 5,108

REFERENCES

- Alvesson, A. (2002). *Understanding Organizational Culture*. London: Sage Publications.
- Ancona, D. Bresman, H. Kaeufer, K. (2002). *The Comparative Advantage of X-Teams*. MIT Sloan Management Review. Spring. Vol. 43. No.3
- De Bono, E. (1999) *Six Thinking Hats*. London. Penguin
- Christensen, C. (2003). *Innovators Solution*. Cambridge, MA: Harvard University Press.
- Brynjolfsson, E. McAfee, A (2012) *Race Against the Machine*. How the Digital Revolution is Accelerating Innovation Driving Productivity, and Irreversibly Transforming Employment and the Economy. Research Brief, The MIT Centre for Digital Business.
- Cox, G.(2007). *Cox Review of Creativity in Business*. Building on the UKs Strengths. London: HM Treasury
- Csikszentmihalyi, M. (1999) in R. Sternberg (ed.) *Handbook of Creativity*. Cambridge: Cambridge University Press
- Dames, Robson, Smith, & Tumulty (2008, September) *Beyond Open Innovation: Leveraging Social Capital*; Proceedings of FITCE Congress, London, 21-24 Sept 2008.
- Davis, T (2000) *Innovation & Growth: A Global Perspective*. London: PriceWaterhouseCoopers
- Denzin, N & Lincoln, Y (2000) *Handbook of Qualitative Research* London: Sage Publications
- Dodgson, M. Gann, D & Salter, A. (2005) *Think, Play, Do*. Technology, Innovation and Organisation. Oxford: Oxford University Press.
- Dyer, JH. Gregersen, HB. Christensen, CM. (2009) *Harvard Business Review*. Cambridge. December, 2009.
- Edmondson, C. (2011). *Strategies for Learning from Failure*. *Harvard Business Review*. April, 2011. Vol. P. 51
- European Commission European Commission (2007): "SME Definition".
http://ec.europa.eu/enterprise/enterprise_policy/sme_definition/index_en.htm
- Griffin, D & Stacey, R (2005) *Complexity and the Experience of Leading Organisations*. Abingdon: Routledge
- Harris & Halkett (2007) *Hidden Innovation*. London: NESTA
- Harris & Nightingale et al (2006) *The Innovation Gap*. London: NESTA
- Holland, John H.; (2006). "Studying Complex Adaptive Systems." *Journal of Systems Science and Complexity* **19** (1): 1-8.
- IBM (2006). *Expanding the Innovation Horizon*, Global CEO Study.
- IBM (2010) *Capitalizing on Complexity*. Insights from Global Chief Executive Study
- Isaaksen, S & Tidd, J. (2006) *Meeting the Innovation Challenge*. Leadership for Transformation and Growth. Chichester. Wiley
- Kolb, D 'Management and the learning process' In: 'How Organisations Learn.' Starkey, K. (1996). London: Thomson.
- Leadbeater, C. (2006, November). *The Ten habits of Mass Innovation*. Provocation 01. London: NESTA
- Malone, T. (2004). *The Future of Work*. Cambridge, MA. Harvard University Press.
- Malone, T. Laubacher, R & Dellarocas, C. (2010) *Harnessing Crowds: Mapping the Genome of Collective Intelligence*. Boston: MIT Sloan Management Review. Working Paper 4731-09
- Metcalfe, S. (2007). '*Innovation systems, innovation policy and restless capitalism*'.
- In F. Malerba & S. Brusoni (Eds.), *Perspectives on innovation* (pp. 441-454). Cambridge: Cambridge University Press.

- OECD (Organisation for Co-operation and Economic Development). (2010) *Innovation Strategy: Getting a Head start on Tomorrow*. Paris: OECD
- OECD (Organisation for Co-operation and Economic Development). (2010), *Innovative Workplaces: Making Better Use of Skills Within Organisations*. Centre for Educational Research and Innovation. Paris: OECD
- Ostrom, E (2009) 'What is Social Capital' in Bartkus, V O. *Social capital: reaching out, reaching in*. Cheltenham. Edward Elgar Publishing.
- Paton, R & Karunaratne, N (2009) Innovation and Engagement: The Honda Case. *Information and Knowledge Management Systems (VINE)*, 39 (4). pp. 280-297. ISSN 0305-5728
- Pentland, A. (2010) The Signal is Human. *American Scientist*. Volume 98.
- Radjou, N. Prabhu, J. Kaipa, P & Ahuja, S. (2010, May). 'How to Ignite Creative Leadership In Your Organization. *Harvard Business Review*. Retrieved May 19, 2010.
http://blogs.hbr.org/cs/2010/05/how_to_ignite_creative_leaders.html
- Silverman, D (2005) *Doing Qualitative Research*. Second Edition. London. Sage.
- Sitkin, S. (1992) *Research in Organizational Behavior* article titled "Learning Through Failure: The Strategy of Small Losses."
- Vonn Stamm, B. (2008) *Managing Innovation, Design and Creativity*. Chichester. Wiley