Designing creative frameworks: design thinking as an engine for new facilitation approaches

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Abstract: This paper documents implications and opportunities for the design profession offered by the rise of the knowledge society and digital economies. Within this we show the value of applied design thinking in the creation and delivery of business development and facilitation. Two case studies document the design and delivery of contrasting consultancy projects where the design of problem-solving frameworks (rather than conventional facilitation of events) resulted in new understanding and business development. These approaches were underpinned by a common conceptual model that describes our philosophical underpinning for the application of design thinking across disciplines both within and beyond traditional areas of professional design engagement. Finally, we discuss the implication for design practice of using design thinking as a mode of interdisciplinary interaction and cocreation of problem-solving approaches between designers and others (rather than an activity just for designers) which represents a step beyond conventional participatory design approaches.

Keywords: DCFs; designing creative frameworks; ImaginationLabs; applied design thinking; interdisciplinary creativity; problem-solving approaches; cocreation.

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1   Introduction

This paper discusses the design profession in the context on ongoing (predominantly) western governmental and international contexts and the need for a reassessment of the role of the design professional. We undertake this through an examination of the history of problem-solving research and practice with a particular emphasis on the relationship of this to business, design practice and facilitation.

These areas inform two case studies that describe the creation of design thinking frameworks for business development looking particularly at high technology and new media contexts (one case study with Dare Digital one of the UK's top digital design agencies and the other with Mott MacDonald, a technology infrastructure consultancy working with Walsall primary care trust (PCT) in this instance). These case studies are underpinned by a common conceptual model describing the rational and practice of using design processes in the creation of business development strategies in an increasingly interdisciplinary context.

Finally, in presenting this model and the case studies we discuss approaches to design that we argue go beyond conventional participatory design approaches and extend the role of designer beyond traditional boundaries.

2   Context

Globalisation is creating tremendous opportunities as well as challenges for the design industry (Cox, 2005). As an industry, design faces challenges that are often be at odds with potential opportunities. For example, addressing the business challenges of intensified global competition must be reconciled with pressure on natural resources and the threat of climate change (Design Council, 2008), while the rapid pace of technological advance is changing the way that the industry operates with distributed teams and cocreated solutions becoming the norm. The traditional boundaries of design are blurring, as are the roles it is increasingly called upon to undertake.

There is a growing recognition that through the effective integration of design – linking creativity and innovation, and shaping ideas to become practical and attractive propositions for users or customers (Cox, 2005) – companies are more likely to be innovative, become more competitive, increase their profits and boost their performance.

Global economies are moving fast to build design into their business base (Design Council, 2007) as well as utilising designerly approaches in their business landscape. The competitive threat posed by emerging economies, such as Brazil, Russia, India and China

collective do not just challenge low value, labour intensive activities, but increasingly the high technology, high value and high skilled sectors, in which indigenous capabilities in design skills are required. China has opened a staggering 400 specialist design schools in the last two decades and has estimated 200,000 industrial design students compared with 4,000 in the USA (Design Council, 2007). India, Singapore and New Zealand have invested in design in the form of centres of excellence and national design centres. This presents established 'design centres' with a challenging context in which to operate.

The UK design industry, representing 62,000 designers – spread across product, service, branding, graphic, fashion, interior and craft sectors, with a £3 billion annual turnover (British Design Innovation, 2007) – is facing growing competition from the global market for design and creative services (Cox, 2005). The UK design industry predominately comprises of small, young businesses that each employ a handful of designers. Many of these businesses focus upon the here and now and commentators are concerned by the lack of long-term perspective (Design Council, 2005). Although the roots of the modern design profession can be traced back to the Renascence (Julier, 2000), in many ways it is still a fledgling industry when compared to many other professions. This is reflected in its business structures, composition and demographics. Over 60% of designers are under 40, 60% of design agencies employ 5 people or less, over 75% of design agencies have an annual turnover of less than £100,000 and over half of design business owners do not know what will happen to their business after they leave (Design Council, 2005).

Although the mindset of the design businesses facing international competition is proactive and positive, and many believe that the UK design industry is big, successful and optimistic, a recent survey (British Design Innovation, 2007) reveals an opposite picture of the industry, with a 30% fall in turnover over the past five years and a 15% fall in employees over the last two years, signifying a significant shrinkage in the size of the industry.

In a climate of intensified competition, design organisations are seeking to develop new income streams to augment the threat to traditional areas of activity (Brown, 2008). As a potential solution for the future of the design industry, many promote the concept of design thinking (Owen, 2006), a term given to the introduction of design methods and culture into fields beyond traditional design, such as business innovation. Characterised by empathy, integrative thinking, optimism, experimentation, collaboration and visualisation, design thinking can capitalise upon the world shift from industrial manufacturing to knowledge work and service delivery. The increasing use of designerly approaches, designers are no longer being 'asked to make an already developed idea more attractive to consumers, organisations are asking them to create ideas that better meet consumers desires and needs' (Brown, 2008). Brown claims that the former role is tactical and results in limited value creation; the latter is strategic, interdisciplinary and leads to dramatic new forms of value. This application of design thinking across disciplines is a fundamental characteristic of design thinking. The 'promiscuous' nature of the design profession is evident throughout its history, explicitly it is evident in Jencks' linking of the way the design group Archigram applied the strategy of 'clip on' not only just to their building plans but also to their underlying philosophy because they 'clip-on (steal) ideas from every possible source' (Jencks, 1971). This is not a pejorative description, as Peter Cook says 'design can and must extend its territories, devouring from others if necessary' (Cook, 1996).

This spread of design thinking into other areas is especially noticeable in the world of business (Verganti, 2006) where design thinking has been closely linked to innovation processes (Utterback, 2007; Wylant, 2008). Design thinking is now being cited as an attitude rather than an activity where it extends far beyond the traditional design 'picket fence' into an interdisciplinary landscape where it is able to mediate this attitudinal change. This is part of a critically important discussion about the move from a material to a knowledge-based economy, specifically in the UK, the Department of Trade and Industry (DTI, 2005) reinforce the importance of innovation in terms of value added and to economic advantage in the UK, stimulating higher productivity and sustainable profitability. This also leads to the concept of innovation encompassing more than the generation and use of new technology, extending this to the idea of the knowledge-based economy (DTI, 2005).

3   Creative facilitation context: creativity techniques

There is an increasing emphasis on maximising creativity, mental capital and problem-solving in business, especially in western economies with a shrinking manufacturing and raw materials base. 'In order to manage human intellect, managers must enhance their staff's problem-solving abilities and encourage them to share information' (Quinn et al., 1998).

While this really started to be a key issue in the last ten years or so, the roots of this move can be drawn back to a specific publication in the 1950s. Alex Osbourne was a partner in the advertising agency when he wrote *Wake up Your Mind 101 Ways to Develop Creativeness* (Osbourne, 1952). Many of the key concepts are not only in creativity and facilitation techniques in business, but also design education can, be traced back to Osbourne's primer for the corporate world and the commercial/academic community of research that developed around this. In 1952, Osbourne detailed techniques such as brainstorming and started the development of an approach called creative problem-solving (CPS) concentrated in a research group in Buffalo State College. The result has been a series of iterations in six major phases of CPS including Osbourne–Parnes five-stage CPS model (v2.2) (Parnes et al., 1977). While this may not be immediately familiar, underpinned by ongoing empirical research this introduced the idea of phases of convergent and divergent thinking in the creative process that is common currency in design process discussions. Later iterations of CPS stresses a careful balance of convergent/divergent or imagination and judgement (Treffinger, 1982). The latest iterations of CPS promote a constructionist educational perspective incorporating an adaptive, user-centred 'meta-components' approach (Selby et al., 2004). This is non-linear process of understanding challenges, generating ideas, planning and preparing for action.

While CPS resonates either directly or indirectly through much published writing in this area, there are many other creativity models and frameworks, some are similarly underpinned by research, e.g. TRIZ (Orloff, 2006), Prince2 (Bentley, 2005) or more informal descriptive publications for business such as those produced by the design company IDEO (Kelley and Littman, 2004, 2005). Design relates well to these approaches and can act as a primer for much of these activities.

Operating within these frameworks there are a multitude of CPS techniques. The most familiar of these would be de Bono's lateral thinking approaches (de Bono et al., 1990), but there are many more. The innovation company Mycoted provides a free online resource of over 400 techniques divided into categories, such as idea generation, problem definition and idea selection (Mycoted, 2009).

There are advantages and disadvantages to these techniques and approaches but for a company looking to engage more effectively with problem-solving and creativity there are two interrelated problems. While large companies, such as Toyota, Xerox-Fijitsu and Rolls Royce, have a vibrant, constantly improving problem-solving process and research to underpin this (Burt, 2003), most companies do not have this resource. The result is a lack of experience that means companies do not necessarily have experience with a broad range of techniques making adoption or selection of approaches somewhat hit and miss (McFadzean and Nelson, 1998). This is not to say that smaller companies are less innovative or creative but rather that they are less well placed to reflect on or consciously improve their creative processes.

The role of the facilitator has developed to help ameliorate this bring experience in problem-solving techniques and working with groups towards an agreed end. Our research group, ImginationLancaster at Lancaster University, reasoned that with a century or more institutional experience in problem-solving, innovation and working with diverse groups that design thinking has the potential to contribute to this area.

Facilitation has been described in terms of maximising 'process gains' and minimising dysfunctional behaviour (process losses) as part of a series of actions to move a group towards an agreed aim or goal (Mejias, 2007; Nelson and McFadzean, 1998). In design terms, this is a conventional user-focused approach with the facilitator taking the position of a neutral guiding hand keeping (usually small groups) on track and moving smoothly towards their goal. In this context, the facilitator is willing to walk upon uncertain ground – both uncertain for the facilitator and facilitated alike. It is this rejection of 'process gains' and the utilisation of visualisation techniques that distinguishes a design-based approach from facilitation and management consultancy approaches.

We are proposing (and presenting here some case studies) that take an alternate approach in which we explicitly design problem-solving approaches and sessions. We think this has emergent implications for both the design profession by going beyond user-centred design to engaging with citizens and for facilitation and CPS in business.

4 Designing creative frameworks: case studies

This section presents two case studies that detail our approach to designing problem-solving approaches that engage participants through collaborative, practice-based, interactive events or ImaginationLabs. ImaginationLabs are events that provide fresh perspectives on real-world business issues and develop innovative directions that are grounded in rigorous, leading edge research.

Case studies present two ImaginationLabs that addressed wholly differing areas of concern but were underpinned by a shared methodology of designing CPS frameworks that participants are able to inhabit:

- *Mott MacDonald* is a management, engineering and development consultancy serving the public and private sectors worldwide. They operate in 120 countries with 14,500 staff working in all sectors from transport, energy, buildings, water and the environment to health and education, industry and communications (www.mottmac.com).

- *Dare Digital* is an award winning interactive marketing agency which was founded on the core belief that strong ideas lead to better business results, which employ 220 employees and have clients including Sony, Vodaphone and Barclays (www.daredigital.com).

ImaginationLabs are bespoke and developed in collaboration with participants. Our approach is to develop agendas in partnership with participants that not only address what they want, but also what they need. Utilising experience in workshop facilitation, design thinking is employed to challenge norms and enable participants to feel comfortable upon uncertain ground.

In advance of ImaginationLabs, discussion typically takes place to identify the priorities and expectations of stakeholders. This is an iterative process involving debate and compromise particularly in terms of the scope and remit of each event and will result in agreed goals. Through the use of design thinking techniques, facilitators then undertake a development process that mirrors a typical design process to address agreed goals. In this context, the development of an ImaginationLab shares numerous characteristics with the design process and broadly follows the following four-stage process. Each of the stages consists of a series of iterative loops where exploration and testing of ideas can happen:

- *Discover*: here potential strategies for achieving the overall goals of the ImaginationLab are explored in an open and exploratory manner. A divergent process where multiple options are considered and evaluated against the practicalities and resource implications.

- *Define*: establish critical parameters (such as number of participant's including facilitators, event duration and timing, venue requirements, etc.) and confirm with commissioning organisation.

- *Develop*: here we enter into an iterative loop where facilitation approaches are refined through prototyping and testing. Although a preferred approach is established in this phase, it is common for changes to occur up until the end of the phase.

- *Deliver*: materials (prompts, exemplars, proformas, examples, etc.) are created and finalised for use in the ImaginationLab. Facilitator notes are created to support the ImaginationLab. An agenda for the ImaginationLab is confirmed and distributed in advance.

Although the above process describes the conception and development of the ImaginationLab, the development of each event carefully responds to participant characteristics, such as group dynamics or personal agendas, and is conceived with flexibility and the ability to adapt the agenda 'on the fly' as required. A number of

eventualities will have been considered during the development process but experience has shown that facilitators need to be willing to adapt the schedule, focus and potentially outcomes during the delivery of these events.

This process recognises the role (and sometimes the necessity) of dysfunctional behaviour, non-linear approaches and shifting goals. We also try and engage with participants before, during and after the 'ImaginationLabs' in a more collaborative, cocreating approach than conventional facilitation, working with groups to create a framework for action that is specific to them and created by them (in collaboration with other actors). A pertinent analogy is that through working with organisations to create their own tools and techniques – we are not just giving organisations nets not fish – we are giving organisations the ability to make more and better nets themselves. This approach is reflected in both the case study and conceptual overview of our process, described in Table 1.

The participants from the ImaginationLabs (Mott MacDonald and Dare Digital) directly provided feedback to the workshops that enabled a first stage of evaluation to be undertaken. Mott MacDonald identified transferable approaches (such as the development of 'Personas' to humanise their stakeholders) that would be applicable to much of their business activity; the use of divergent and creative thinking techniques successfully 'challenging the norms' and often widely help assumptions and the benefit of team-based problem-solving to address complex challenges. Dare Digital identified the need to develop new systems of innovation as core to a sustainable future; that the event highlighted tensions between the various functions within the organisation (particularly, the 'techies' and the 'creatives') and that the event provided new and more junior staff to feel that they had a voice within the organisation. As these case studies have only been recently undertaken, further analysis and evaluation are planned in the future.

Table 1 Case study details

Organisation: Mott MacDonald	Dare Digital
Duration: One day	Duration: 3 hr
Aim: To explore how future developments in information communication technology can help communication of health issues to clients of Walsall PCT specifically pregnant teenagers and cardiac patients	*Aim*: to start the process of developing new innovation structures in the company that integrate technical and creative departments more productively
Participants: 5 academics, 5 post-graduate students, 6 Mott McDonald and 2 Walsall PCT	*Participants*: 2 academics, 25 Dare creative department, 10 Dare technical department and 4 Dare management
Location: Lancaster University	*Location*: Dare Digital (London)
Duration: 9:30 am to 4:00 pm	*Duration*: 4:00 am to 7:00 pm
Distinctive features	
Externally focused	*Internally focused*
• Effecting composition and activities of the lab	• There were only people from Dare at the presentation with an imagination researcher and a design visualiser
• Students, academics, third party consultants and clients contributed to the day workshop	• A broad range of the company hierarchy contributed from Board members to junior designer/technicians
• There was a proportionally small representation from the actual client	• There was minimal use of abstraction devices such as personas – most comment was addressing direct experience
• In activities groups started by creating personas of the stakeholders and addressing further ideas towards meeting the needs of these fictional people	• There was a degree of sensitivity about the content of the lab

Table 1   Case study details (continued)

Organisation: Mott MacDonald	Dare Digital
Duration: One day	Duration: 3 hr
Detached, objective consensual approach	*Challenging (Socratic) approach*
• We built on the culture of empathy and understanding brought by the main stakeholders and the predicted reserve felt by people coming together for the first time • The serious subject area, strong social worker component in the group and ultimately representing social groups not present in the lab (e.g. we chose not to have pregnant teens in our lab) required a more serious, reflective, respectful approach	• As a creative agency, a robust, open dialogue about ideas is the norm; we employed devices such as 'critique' familiar to the group • We encouraged free thinking and expression and genuine responses (one post-it labels the technical department as 'Idea Nazis') A lot of humour was employed by participants (and encouraged by us) to defuse personal attacks but still communicate the issues. This was built into the event through a 'caricature' exercise
Text communication using colour to add layers of meaning	*Non-textual communication*
We used post-its extensively in this event, all stakeholders we comfortable with using these in idea generation, also as each member had their own 'voice' we made barriers to contribution very low Contrasting colour post-its were used in the process to show phase changes, e.g. from 'bad' to 'good' ideas or from present to future applications of technology (see Figure 1)	We concentrated on non-textual presentation of information, not only through predominately verbal but also through illustrations and diagrams. Further, we used the visual languages employed by technical and creative departments as part of the diagnostic process by asking these two groups to caricature the other groups process visually (see Figure 2)
Direct challenging of assumptions	*Assumptions addressed implicitly*
We realised that the stakeholders are grounded in orthodoxy, and challenging this was not going to be a natural approach for participants. We developed a technique called 'bad ideas' that gave a strong structure where participants had to come up with the least appropriate responses then use these as a foil to develop new understanding of the assumptions they have. The intention is to translate bad ideas into good ideas	We encouraged the assessment of assumptions through the creation of an 'ideal' production process. The natural culture in the agency ensured that there were wildly divergent, non-conventional responses to this, articulated and discussed by the group (e.g. 'we should all vote on ideas to be presented in pitches to companies'). These effectively highlighted the assumptions made in the production process and the roles of creative and technical participants

Figure 1   Image from the Mott MacDonald ImaginationLab

Figure 2 Image from the Dare Digital ImaginationLab
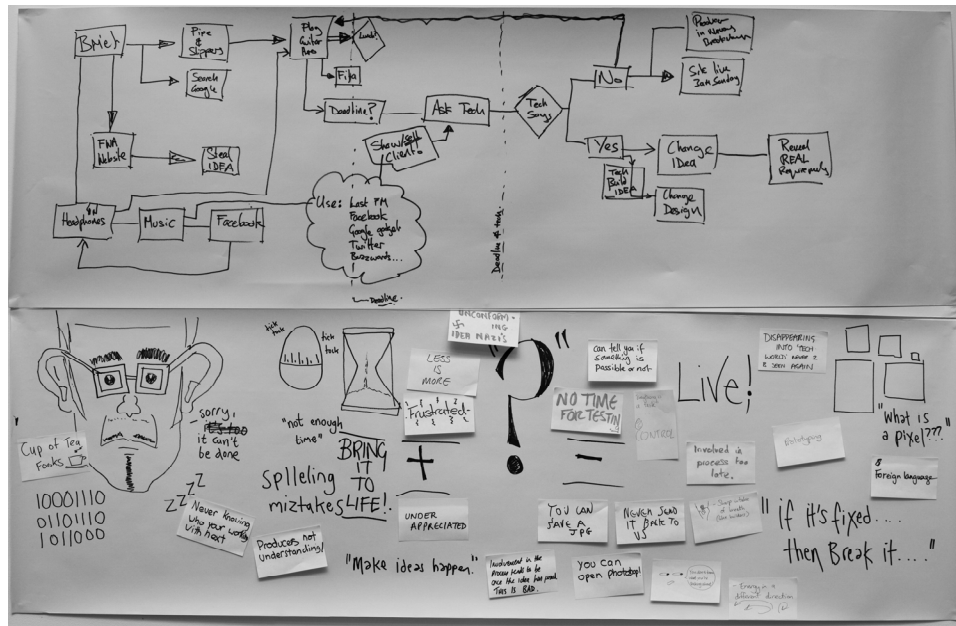
5 Designing creative frameworks: conceptual overview

Conceptual analysis of our approach reveals a number of key characteristic that underpin, and help to guide the development and implementation of, ImaginationLabs. In line with Archer (1963), Clarkson and Eckert (2005), Pugh (1990) and Lawson's (1997, 2004), observation that at an abstract level, there is a central core of generic stages that constitute a commonality between design processes, the development of the designing creative frameworks (DCFs) conceptual model revealed a series of iterative and interrelated activities. In line with Goel's (1995), observation that design development occurs in distinct phases, the DCF conceptual model has been divided into a number of phases, namely inputs; DCF; ImaginationLab and outputs.

- *Inputs*: this phase enables an understanding of the priorities and expectations of stakeholders as well as the scope and remit of the project. Close liaison with clients is required to be able to respond to specific project parameters. Overall goals are agreed.

- *DCF*: a four-stage process (discover, define, develop and deliver) utilises divergent and convergent approaches, in an iterative manner, to explore, develop, refine and manifest the facilitation approach.

- *ImaginationLab*: the implementation phase of the project through a participatory workshop. Even at this stage, there is often the need to be reactive to a variety of parameters, such as group dynamics or personal bias, to ensure the relevance and validity of the activities and that the overall project goals are being met.

- *Outputs*: the outcomes of the process can be varied and are appropriate to the goals of the project as set out in the inputs phase. As our approach can encompass a variety of project, this phase is not prescriptive and can be adapted to the audience and available resources.

The following details the DCF conceptual model (Figure 3).

The use of divergent and convergent thinking, undertaken in an iterative manner, is core to our approach. This approach resonates with Osbourne–Parnes CPS methodology (Parnes et al., 1977), particularly in terms of convergent and divergent phases of thinking in the creative process. As a key characteristic of design thinking, creating many options (diverging) and then narrowing them down into their options (converging) is clearly evident in our approach. For example, in the discover and define stage of the DCF phase, a process of breaking the problem (or issues) down into pieces, 'decomposing' them in an integrative manner, occurs before synthesising follows as reordering the pieces based upon dependencies, solving each sub-piece and finally knitting all the pieces back together is undertaken (Alexander, 1962; Dubberly, 2004). Banathy (1996) identifies the consideration of a number of inquiry boundaries as fundamental to the divergent approach in terms of establishing core values for the project. Additionally, making choices to create an image of the future system is central to the convergent aspect of this iterative process. The image of the future system is then used as an input to develop and deliver stages of the process. With connection to Banathys' dynamics of divergence and convergence (Banathy, 1996), our model illustrates the iterative nature of our approach in terms of the repetition of the divergence–convergence methodology. Through the develop and deliver stage of the DCF phase, facilitation approaches are developed, refined and iteratively through prototyping and testing. The develop stage employs divergent exploration of the problem space while the deliver stage requires a convergent mindset to ensure materials are available in a timely manner for the ImaginationLab. Iteration and compromise, aspects wholly evident in the design process, characterise the convergent approach of the develop and deliver stages of this phase.

The iterative nature of our approach has parallels with Kumar's (2003) innovation planning design process where 'modes of planning' are constituent (rather than steps) emphasising the iterative and interconnected nature of the process.

Figure 3   DCFs conceptual model
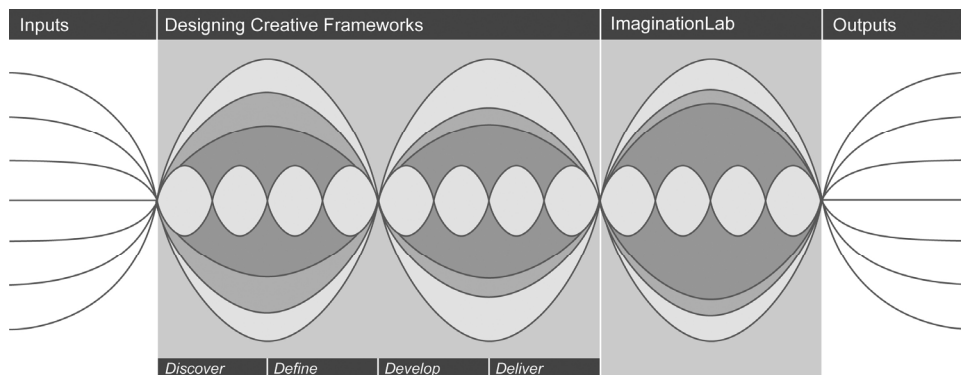
The DCF conceptual model is presented in a generic manner and its shape is applicable throughout all projects. What is important to note is that this model is morphed and stretched depending on the characteristics of each project. Each of the phases consists of a series of iterative loops where exploration and testing of approaches occurs. Emphasis is placed upon the flexibility of our approach which is responsive to the needs of clients, is able to adapt to a changing environment, accommodates group and personal dynamics, and is not dogmatic in its application.

The above description of the DCF process is not presented as a contentious take on the design process but intends to contextualise our approach in the arena of facilitation of the creative process. It synthesises conceptual approaches not only from both within design practice and research, but also importantly from beyond these traditional discipline boundaries. With the use of divergent and iterative thinking, it supports non-linear and nebulous investigation. It aims to enable organisations to develop and inhabit their own creative frameworks.

6 Discussion

These activities gain boarder significance when considered as part of a wider examination of the design industry and its relationship to business and culture. The notion of a western reliance on knowledge rather than manufacturing (or raw material) society is well accepted. This is often conflagrated with the highly overlapping, but subtly different notion of the digital economy. Both of these are key economic, cultural and research drivers, especially in Western economies.

This represents an opportunity for the design profession, the ability to apply creative thinking to solve problems is increasingly being valued in an expanding arena of activity. Clearly, designers are well placed to make a significant contribution in this respect. This represents a new 'meta-design' engagement that it sympathetic to advances through service design approaches but the design or problem-solving approaches and facilitation is a new application of design thinking.

Conversely, this breaking down of the barriers or demarcation of creative thinking is challenging traditional areas of professional design activity. This is evident both in practical and academic experience. Examples include, lead-user innovation, where the key site for product innovation is with a sub-group of users, not design or R&D departments (von Hippel, 2005) and mass creativity, a recognition that digital communication can enable the creation of new products and services without professional design and manufacture (Leadbeater, 2007). While open innovation is having a significant impact as conventional design and R&D offices are augmented and in some cases superseded by an open network of collaboration across disciplines (Chesbrough, 2006). Practically, open source is radically changing the software design industry an effect mirrored in web design industries with the advent of highly accessible, free and web creation tools (universal laptop rather than desktop publishing).

These factors and others represent a shifting economic and creative landscape that requires design as a discipline to adapt and reflect these changes. An engagement with facilitation and the development and communication of design thinking approaches as 'products' in their own right is an example of the value that design can bring to interdisciplinary, particularly within the context of applied creative thinking.

The challenge is to develop a rigorous evidence base and body of knowledge that develops and disseminates the advantages of design thinking in the creation of interdisciplinary modes of working.

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