

Inflection Point

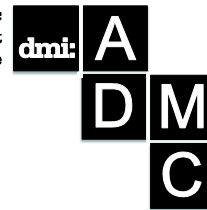
DESIGN RESEARCH MEETS DESIGN PRACTICE

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Beyond the bottom line: redefining the value of design in SME formation

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For SMEs to operate in the complex and globalised economic landscape of today engaging with innovation can sustain competitive advantage. Within Design Management, design is being increasingly posited as a strategic resource to facilitate the absorption of new design resources and leverage design knowledge in ways that support SMEs through such economic pressures.

Evidencing the relationship between design and economic performance is complex, leading to extensive current research and industry efforts to show how design adds economic value. Despite the value of such efforts, it is important to recognise that innovation means different things to different organizations, especially for start-ups and SMEs. Within the rising tide of design-led innovation, there is a gap being explored in how design can effectively capture and evaluate its contribution within the complex and diverse situations of business development it engages.

In seeking to address this gap, this paper presents findings from research undertaken within Design in Action (DiA), an AHRC-funded knowledge exchange hub. Presenting DiA as a single case study, the paper offers methodical reflection on five case example start-up businesses funded by DiA in order to explore the value that design-led innovation approaches offered in their formation.

Keywords: SME formation; design-led innovation; knowledge exchange

Introduction

In recent years the strategic and innovative aspects of design have been emphasized in discourses around SME differentiation from competitors. With a backdrop of globalization and rapid communications advances, it has been argued (Brown, 2009; Verganti, 2009; Lockwood, 2010) that it is no longer enough for design to focus on cost efficiencies. Facing unprecedented levels of business and technological intricacy, design brings a set of principles and core skills that can help SMEs deal with complexity and bring empathy (Kolko, 2015). As a result, design is being increasingly posited as a strategic approach to support SMEs through economic pressures (Acklin, Cruickshank & Evans, 2013).

The paper draws on data captured from the Design in Action (DiA) knowledge exchange hub, which is one of four UK hubs funded by the Arts and Humanities Research Council, drawing together six universities and art and design institutions across Scotland. The key focus of DiA was investigating design as a strategy for business growth in Scotland and the chosen approach was the Chiasma method, which was a design-led, sandpit-style event for open innovation (Kearney and McHattie, 2014). Chiasma gathered collaborators from a range of business, design, and academic backgrounds to develop commercial ideas from which a selection was awarded funding and support from DiA to prototype and take the ideas to market.

The research for this paper is grounded within the complex context of the design-led start-up developments funded and supported through this programme. Following a brief scope of context around the potential value of design in SME formation, DiA is presented as a single case study, with five case examples of funded companies. Methodical reflection is offered in a thematic analysis, which identifies four key ways in which design added value to the funded companies during their formation stages.

Scope of Context

Challenges of supporting SMEs

SMEs (Small and Medium-sized Enterprises) are hugely important to the UK economy constituting 99.9% of private sector businesses in 2015, making a considerable contribution of 60% to job creation (BIS, 2015), as well as playing a key role in growth by driving competition and stimulating innovation. There is argued to be an established empirical relationship between innovation and firm growth (BIS, 2013). In a rapidly changing, globalized and highly competitive marketplace, small growth orientated firms have been shown to be a crucial contributor to sustainable economic development (Mason and Brown, 2010). SMEs have also been regarded as an important contributor to sustainable economic and employment recovery (Clifton, Keast, Pickernell, and Senior, 2010).

Despite the associated benefits of SMEs they face considerable barriers to growth and sustainability and these have been identified as particularly acute for smaller businesses, as they have fewer resources available to overcome them (BIS, 2013). In fact, many SMEs exit the market in their first few years, and of those who survive many remain small (BIS, 2013). It is widely accepted that there is not a standard model for business development and SME growth is complex and typically episodic (BIS, 2013). Despite the recognition of knowledge as a driving factor of business sustainability and growth, SMEs have traditionally found it difficult to access new knowledge. This is related both to the availability of knowledge and to the ability to absorb new knowledge (Fogg and Peers 2012). A lack of absorptive capacity – the ‘ability to recognise the value of new external knowledge, assimilate it and apply it to commercial ends’ (Cohen and Levinthal, 1990) – is a common problem for SMEs, related to shortages of time and resources.

SMEs operating in the complex and globalized economic landscape of today must engage with innovation to seek competitive advantage, but there is a paucity of evidence around the best approaches for this process. Lacking the economies of scale and scope to innovate in-house, small - businesses must engage in risky open innovation processes. There is a key challenge for public policy in promoting the enhancement of the innovative capabilities and capacities of SMEs. The innovation deficit in the UK is thought to be linked to low levels of investment in research and development (R&D) and has resulted in a widening gap between the UK and its G7 peers (The Economist, 2015). Whilst asserting that dynamic

innovative-driven regions are crucial for future prosperity, it has been argued that innovation and entrepreneurship policies should better attune to local economic specificities (Mason, Brown, Hart, and Anyadike-Danes, 2015; Ross, Adams and Crossan, 2015). One approach for ameliorating the innovation challenges faced by SMEs, has been to emphasize the role of universities with increasing encouragement for them to become strategic actors in the knowledge economy (Deiaco, Hughes & McKelvey, 2012). Unsurprisingly, developing fruitful exchanges of knowledge between universities and industry is complex (BIS, 2015) and art and design disciplines have been somewhat neglected by formalized knowledge exchange (KE) programmes (Comunian, Gilmore, & Jacobi, 2013; Crossick, 2006; Davenport, 2013). Part of the genesis for DiA recognized that design could add critical value within KE processes aimed at SME formation and the paper now turns to examine how this role for design has been articulated.

Value of Design for SME Formation

Design Management positions design as a strategic resource for organizations and argues for the leveraging of 'design knowledge to achieve competitive advantage' (Acklin, Cruickshank and Evans, 2013:6). In order to help articulate the ways in which design can add value to organizations, models have been developed such as De Mozota's *four powers of design*, which channels design towards providing competitive advantage (De Mozota, 2006:45); or Acklin's Design Management Absorption Model (DMAM), which aims to address the limited adoption of design within SMEs (Acklin, 2013). Design continues to undergo a perpetual struggle to define itself (Press and Cooper, 2003), and it is important to recognise that innovation means different things to different organizations. While the design industry goes to great lengths to demonstrate the value design can provide for innovation in businesses (see, in the UK for example, Cox, (2005); Design Council And DBA (2005); Design Council (2008a; 2008b; 2015), the emphasis is still on design distinguishing its approaches, knowledge and values from those of management.

Establishing a *culture of innovation* is acknowledged across design and management literature as a powerful and sophisticated agent of innovating ways of working (Alvesson, 2005; Malone, 2004; Brown, 2009; Neumeier, 2009; Martin, 2009; Kelley, 2005 and others). This is associated with exploiting the distributed creativity and knowledge as 'one of the most critical capabilities of successful businesses.' (Malone, 2004:153).

The focus of this paper is on how DiA-funded businesses revealed how design can innovate ways of working during SME formation. Having introduced the context of the use of design-led innovation techniques within KE between HEIs and industry with the goal of business formation, the methodology adopted within this paper is now set out.

Methodology

This paper presents DiA as a case study for design-led SME formation across its chosen economic sectors (Wellbeing, Food, Rural, ICT and Sport). The case study is then supported by five case examples of start-ups funded and subsequently supported by DiA, which have demonstrated some element of strategic design process, or indeed its absence (Please see Fig. 1).

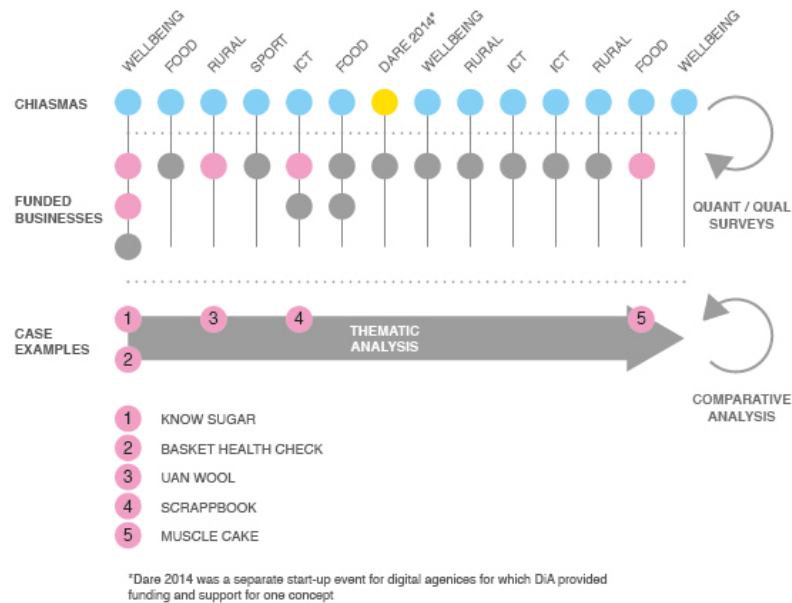


Figure 1 Methodology for Analysing Value of Design within Design in Action

A case study approach is applied to DiA, as it can deal with multiple causation and complexity (Bell, 2005) and can help critically evaluate design practice for “universal ideas to be extracted” (Breslin and Buchanan, 2008, p.38). For the purposes of this paper, case studies are understood as a key method of empirical inquiry that ‘investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident’ (Yin, 2009:18). The context of business formation within DiA, a novel, design-led network of support, was highly complex, specialized and uncertain, aligning assiduously

with Yin's conditions for case study research. Five funded SMEs are deployed in this paper as subsequent 'case examples' on which a thematic analysis is carried out to derive empirical insights on their effective development. This follows the argument drawn by Yee (2010) that such examples can help to find underlying principles of the phenomenon being explored.

In terms of the data sources for the DiA case study both quantitative and qualitative data accumulated through surveys and project management records collected throughout the project is used to inform an overview of the events, businesses and networks that developed. The purpose of the deployment of this data is to provide contextual information about the overarching project from which the five case example startups are drawn.

Case Example Selection

The five case examples were selected according to their coverage of the five economic sectors, their depth of engagement with DiA, design and its researchers, as well as their representation of the variable situational complexities encountered across all the funded projects. The methods of data collection across the case examples have varied slightly in approach so are therefore presented here alongside their individual reasons for selection:

Know Sugar represents one of the most design-led and innovative service concepts to be funded by DiA and comes from the first wellbeing-focused Chiasma. As one of the first funded businesses, it had one of the authors assigned as PhD researcher to follow their development through semi-structured interviews and observation, which, on occasion, stemmed from actual participation in activities as a recognised design contributor to proceedings.

Basket Health Check represents a comparator business concept funded by DiA, due to its lack of design-led development. It also comes from the first wellbeing-focused Chiasma, forming an interesting contrast with *Know Sugar*. It was also assigned with one of the authors as PhD researcher to follow their development, although this was limited to interviews and observations.

UAN Wool represents a business idea brought from outside the Chiasma process, yet from a lead entity who had experienced the first rural-focused Chiasma. This case draws from data gathered from a reflective interview, mediated through visual mapping, towards the latter stages of the business's ongoing development.

ScrAPPbook represents a non-profit, digital business concept funded by DiA and comes from the first ICT-focused Chiasma. This will also draw from data gathered from a reflective interview, mediated through visual mapping, towards the latter stages of the business's ongoing development.

Muscle Cake represents the last funded, product/service business funded by DiA and comes from the last food-focused Chiasma, but also incorporates the sport sector. This also draws from data gathered from a reflective interview, mediated through visual mapping, but also includes observation from participation in activities as a recognised design contributor to proceedings.

A multi-method analysis was applied with the general data collected across DiA, and the data collected within case examples. This begins with thematic analysis across the case examples to provide emergent themes regarding the value of design to business formation. Thematic analysis is particularly useful for researchers as it is a flexible method well suited to large data sets and allows categories to emerge from the data collected (Creswell, 1994; Miles and Huberman, 1994). Our comparative reflections on the value of design observed across the funded businesses allow us to identify potential key contributions of design-led innovation in SME formation.

DiA Case Study

The central focus of Design in Action at the outset in 2012 was to demonstrate the value of design in economic growth and innovation for SMEs in Scotland. Several key phases have been identified as part of the *DiA Knowledge Exchange Process Model*: scoping; interpretation, ideation; formation and evolution. As already touched upon, the key 'creative space' provided by DiA was the Chiasma, a 2-3 day residential sandpit-style innovation event, led by a sectoral call developed during the *scoping* phase, which identified critical sectoral-specific challenges. These key challenges were then focused and framed and appropriate design tools created during the *interpretation* phase. At the Chiasma event multi-disciplinary teams, from business, design, and academia, were brought together to support the *ideation* phase allowing ideas to be tested and validated. During the *formation* stage that began during Chiasma and continued afterwards, participants assembled teams around ideas aimed at addressing particular societal issues and developed pitches for presentation before deciding whether to apply for up to £20,000 funding to prototype and take the idea to market. If funded the businesses were supported in further knowledge development via DiA networks during an ongoing *evolution* phase when the product or service was launched into market.

In terms of the key outputs from DiA, 18 projects have been funded from across the five sectors – food, sport, rural, ICT and wellbeing. This constituted approximately 40% of the projects that applied for funding. In terms of direct job creation related to DiA, in total 107 jobs have been created linked to the project itself and the funded projects. In terms of the nature of these posts 49 of them are Full-time and 50 are Part-time with a further 6 time-limited. 76 have been created by the funded projects, 29 roles at DiA and 2 jobs at the V&A in Design-led business support.

The true long-term impact of DiA – the ripple effects, spillovers and multipliers are difficult to capture and impossible to quantify at this stage. Causal attribution remains complex. There is a tendency within KE impact reporting to give greater emphasis to the direct economic and this is, of course, linked to incentivization from funding calculations for HEIs. A recent survey of DiA networks (n.146, August 2015) found that project participants reported softer wider benefits related to their participation in DiA and acknowledged an important and growing role for design in their projects. A significant proportion (52%) of respondents reported that design was integral to their work and a further 35% reported that design had a significant role to play.

In the other start-ups I worked on before, they didn't invest in design as it was seen as a luxury, something that was nice to have but that you didn't need to have. I now realize that it's a must-have (Chiasma participant, Funded project)

A significant proportion (57%) of those who had participated in DiA reported that this had given them opportunities to work collaboratively and 51% reported that their participation had given them opportunities to coproduce knowledge.

It is very much a collaboration with three different organizations with three very different perspectives on the world...Its really healthy. (Chiasma Participant, Funded project).

The survey respondents were very much advocates of the role of design in providing a competitive advantage and as a differentiating force. 91% of respondents agreed or strongly agreed that design is important to keep ahead of competitors. In addition, 75% of respondents agreed or strongly agreed that there is a positive link between investment in design and profitability.

Up until that point I hadn't done anything involving design and now everything is all about that completely. If you get it right, it can add a ton of value to what you're doing and it separates you from your competitors. It adds to the experience and adds real value (Chiasma participant, Funded project).

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This section has offered a brief introduction to some of the broader ways in which design contributed to business formation and innovation in both tangible and more qualitative ways within DiA. The next explores in more detail the five case example businesses developed during DiA to interrogate these themes more closely.

Case examples: Five funded businesses

The case examples are presented here descriptively, providing introductions to their origins within DiA and the constitution of core members. Thereafter a key summary narrative is provided around the role of design in their development, derived from the interviews and observations collected.

Know Sugar

The first case example follows the Know Sugar team, who secured funding from the very first Chiasma delivered by Design in Action (DiA) under the theme of Type 2 Diabetes in Glasgow, February 2013. Know Sugar's development was followed between February 2013 and August 2014. Know Sugar constituted four members from the Chiasma: the lead entity was a service designer and co-director of a service design agency in Glasgow; a design thinking consultant; an innovation development company director; and a textile design graduate in the process of setting up her own business. A fifth member joined from the lead entity's service design agency after funding was awarded.



Figure 2 'Know Sugar Prototype Shop' Source: Design in Action.

Key Narrative

Being a designer-dominated team led to them developing a highly innovative, multi-platform concept for the initial Chiasma and funding application, which they grounded in existing models and public engagement. The early, exploratory research conducted across the group asked empathic and experiential questions with potential end-users, as well as exposing the existing attitudes of relevant organizations and trends.

These early insights were translated effectively into a service blueprint model focused on behaviour change that persisted as the key reference for developing each element of the business concept. Their focus on sugar was seen as problematic by dieticians and clinicians, who felt a balanced diet was the key message, but the effectiveness of such a focused conversation with their identified end users empowered them to continue against such prevailing attitudes.

The variety and complexity of activities that constituted the Know Sugar prototype (see fig. 2) – encouraging visitors to engage with each station of the prototype, as well as positioning volunteers, with little to no experience of diabetes or sugar, as representing a service to ‘know sugar’ – showed a dexterous handling of complex matters and the mediating role of the designed interactions within the prototype. This chimes with emphasis in recent Participatory Design approaches (Binder, T., De Michelis, G., Ehn, P., Jacucci, G., Linde, P. and Wagner, I., 2011), around the role of *design Things* or socio-material assemblies, which can support ways to embed design in ongoing and complex negotiations rather than a single project task. In this case, the roles that delivered each aspect of the prototype were distributed beyond the core team across multiple design disciplines, such as an architect, a product designer, and a digital developer. The methods of data capture at the prototype tried to cover footfall, visitor responses to each station and an exit survey, all to evidence the interest and potential for their concept. However, the process lacked clear and focused questions to support concept validation, exposing the potential for an academic role to evidence.

Basket Health Check

The second case example follows Basket Health Check, who also secured funding from the very first Chiasma delivered by Design in Action (DiA) under the theme of *Type 2 Diabetes* in Glasgow, February 2013. Basket Health Check's development was followed between February 2013 and December 2013, when the business folded due to failing to negotiate further funding from DiA. Basket Health Check constituted three members: a management consultant as lead entity; a Product Design Engineer and co-director of a design agency; and a Bio-Medical Engineering academic with research expertise in diabetes and business development. A fourth member joined from the product design engineer's agency after initial funding was awarded.



Figure 3 'Basket Health Check Receipt Mock Up', Source: Design in Action.

Key Narrative

From believing in a strong concept at the Chiasma, the team felt they lacked an interaction or service designer with experience of the deliverable

concept. The original funding application asked to run market research and prototype development concurrently, but DiA only awarded initial funding under the agreement that market research was conducted before prototype development.

This led to the management consultant, as lead entity, restricting the early design role to producing visuals as he and the academic led market research. They saw the idea as already formed following the Chiasma, while the design members wanted more scope to explore the idea, even managing to add a crucial API feature through initial mock-ups. The team produced a report from the initial market research, which proposed the potential business model and further work towards prototype development.

DiA once again held back funding until they had identified an industry partner, which the team argued wasn't possible before it was IP protectable, which ultimately ended the business formation early. The lack of scope for creative development, a lack of confidence in the design roles experience in the context, and servitude to traditional business modelling, all proved terminal barriers to its development.

UAN Wool

The third case example follows UAN Wool, who secured funding from the third Chiasma delivered by Design in Action (DiA) under the theme of *Made in Scotland* in Pitlochry, June 2013. UAN Wool's development has been ongoing from June 2013 to February 2016, when data collection ended. UAN Wool constitutes one member: a Business Advisor as lead entity, who wanted to diversify her 650-acre farm and sheep. Design entities would be provided through support from DiA after funding was awarded.



*Figure 4 UAN Wool Launch Stand at Royal Highland Show in Edinburgh June 2015,
Source: Design in Action*

Key Narrative

The initial idea was brought separately from the Chiasma, but an application for funding did emerge following the lead entity's experience within the Chiasma. DiA awarded the funding alongside assigning a design researcher to support the business, who brought in a service/textile designer and a graphics designer to help develop the concept and its focus around Scottish-based, woolen bedding.

Early development was committed to establishing the branding and story through focus groups, as well as a circular economic business model. Research also developed gradually around the qualities of different Scottish wools, their applications for bedding and the best different blends for achieving the best results. This combined with gradual research into treatments and existing evidence for the wool blends, towards receiving an UK allergy certification.

The lead entity was committed to establishing a zero waste business model, proven for allergies, and reclaiming the forgotten qualities of Scottish wool. This commitment led to her resisting advice to push the idea to market sooner, as this was seen as betraying the initial concept and interest of the lead entity in such a business. The design potential was seen in developing the story of a premium product that needed to capture the positive stories associated with her business plan, and validate a very selective and pragmatic growth with proven, like-minded partners.

ScrAPPbook

The fourth case example follows ScrAPPbook, who secured funding from the fifth Chiasma delivered by Design in Action (DiA) under the theme of *Beyond Mobile* in Edinburgh, February 2014. ScrAPPbook's development has been ongoing from February 2014 to January 2016, when data collection ended. ScrAPPbook constitutes three members: a heritage consultant as lead entity, a business advisor, and a creative innovation academic. Design entities would be provided through support from DiA after funding was awarded.

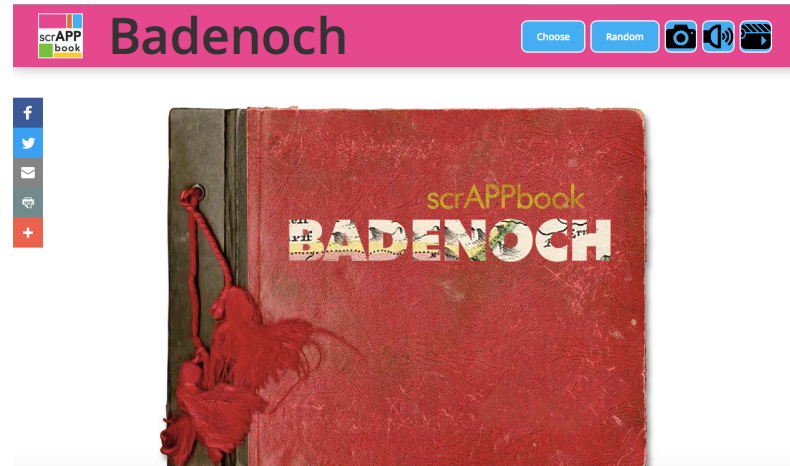


Figure 5 ScrAPPbook Prototype Site for Badenoch, Source: Design in Action

Key Narrative

The business emerged as a non-profit concept for community development and identity, immediately standing at odds to DiA's focus on economic growth, which was a common feature of concepts presented at Chiasma. The lead entity personifies the business development, while the other two members were expressed as mentors and bringing network opportunities.

The initial design development focused on branding and initial structure, which clarified the concept for the team as a process for a site rather than simply a digital product, where all who live or visit the site are afforded opportunities to share their experiences digitally. The greatest moment of clarity for the lead entity came in delivering a role-play demonstration of the

concept at a museum, capturing the interest of a high-profile design partner, pending further investment.

Design's potential was communicated around performing and capturing case studies through strategic development according to client needs: creatively articulating a brief; enrolling local creatives to support curative moderation; and profiling partners who may use the case studies for further interests, such as academic papers. Here the development of networks, through DiA, allowed tacit knowledge spillovers (Bakhshi, McVittie and Simmie, 2008) to develop which were very important as they presented the lead entity with ideas and knowledge she would have been otherwise been unlikely to access.

Muscle Cake

The fifth case example follows Muscle Cake, who secured funding from the twelfth Chiasma delivered by Design in Action (DiA) under the theme of *Food Futures* in Dunblane, October 2015. Muscle Cake's development has been ongoing until March 2016, when data collection ended. Muscle Cake constitutes three members, with one joining once funding was awarded: an entrepreneur as lead entity, who came to the Chiasma with the product concept joining another entrepreneur with a similar concept; and a third entrepreneur who joined during the funding application. Design contribution was provided through support from DiA after funding was awarded.



Figure 6 Muscle Cake Prototype Delivery Packaging for Focus Groups, Source: Muscle Cake

Key Narrative

The timeframe for business development was shaped to be as fast as possible to allow all members full time commitment following funding, leading to more traditional business development that, nonetheless, did grapple with key design questions. The design contribution came from both a brand design agency and DiA itself, supporting the consumer engagement and market research.

The leading strategy was to build a community of ambassadors around the concept, even before product development, to build a strong expert community to quickly sense-check and validate the concept. Product development was a natural, protein-rich recipe explored with food scientists to position against the lesser quality tasting existing products. This developed parallel with a consumer testing workshop, allowing for limited participatory iteration other than in its quality and presentation. Brand elements were presented alongside the product to prove the concept with a priority target, 'beachhead' market and test its wider appeal to health-aware consumers.

An awareness of the brand values emerged around representing a positive, non-intimidating association between athletes, health awareness and protein-rich treating, while validating a market interest in the product itself. The product and subscription-based business model also flagged up critical points of tension threatening the viability and sustainability of the concept, leading towards a more market-sensitive approach to learning how to adapt quickly upon launch. This echoes findings from the Cox Report outlined more than ten years ago, that design "shapes ideas to become practical and attractive propositions for users or customers" (HM Treasury, 2005: 2).

Discussion

The above case examples offer insight into the nuanced and complex situations encountered by the funded businesses within DiA's portfolio during their formation, as well as the influence of design in their evolution. While the key narratives highlight the ebbs and flows of new business formation they also emphasize how the use of design brought value to these processes. This section presents four themes, which are drawn from the analysis of the five case examples.

Meaning-Driven Differentiation

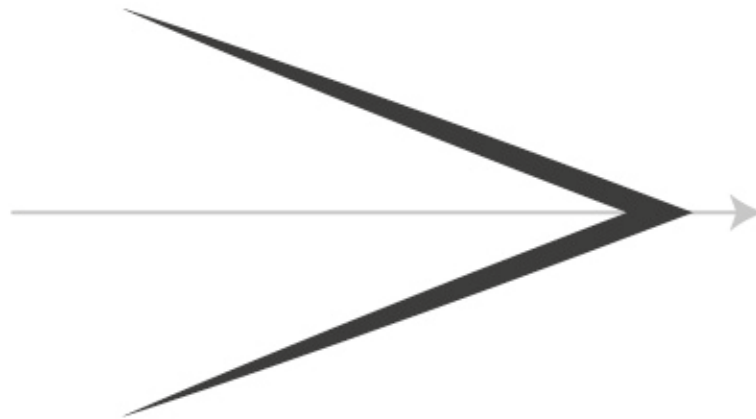


Figure 7 Progressive diagram of the business differentiation

One of the strongest themes that emerged across the analysis was the value of design in understanding the complex situational concerns for each business. This seemed to relate directly to the development of intellectual property (IP), as the concept often needed refinement through iterative representations and discussion. In Know Sugar, the role of designers was paramount in the service concept development as they developed a conversation around sugar and diet through a behaviour change model and user engagement. Basket Health Check were unable to allow for creative *differentiation* and suffered for an under-developed concept they felt no sense of ownership for. For Muscle Cake they prioritized engaging their Ambassadors before developing the product to maximize the viability of the service taking hold. For ScrAPPbook and UAN Wool, they developed a strong

ethos for their businesses through design engagement, which empowered them to resist traditional business models. 'Design as a differentiator' for competitive advantage (De Mozota, 2006) was not the driving force, but design as a differentiator for *meaningful* validation.

I've realized that design is a much more complex thing... it's part of the business planning. There is a huge difference between [business and design], but it depends what aspects need support. In the business planning side it's the nice fluffy stuff that is ignored. They don't think of using design as part of the core values. (UAN Wool, lead entity).

The findings here chime with the emphasis Norman and Verganti (2014) place on meaning-driven innovation in design research. The notion, supported by Krippendorf (2006), is that people construct and coordinate meanings by assuming a mutual understanding. As highlighted earlier, designers can employ this 'second-order understanding' if the *design Thing* (Binder et al 2011), constituted by all the representations, models, research methods and prototypes employed in the business development of the case examples, is to be useful, usable and understandable.

Network-Driven Enrolment



Figure 8 Progressive diagram of network enrolment

Another strong theme across the case examples was the effect of each team's exposure to wider disciplinary networks, and the opportunities for innovation this provided. In actor-network theory, *enrolment* refers to the process in network-building in which people or things are made relevant to the development of a sociotechnical entity (a business), their role defined and their interests and identities orientated to suit (Latour, 2005). UAN Wool's lead entity expressed how her own networks would never have allowed for such design involvement, which became so prominent in exposing multiple avenues of added value. Know Sugar showed great proficiency in engaging large audiences of people and *enrolling* volunteers, however felt keen tensions in the overlapping design roles, and a lack of academic knowledge in their research design. Muscle Cake showed strong strategic thinking by assembling a network of ambassadors for the concept, before then learning rapidly through design-supported market research. ScrAPPbook's lead entity expressed an immense value to having to work in teams she would not have engaged previously, and the financial value this has given her to explore monetization.

Even if the business doesn't work, the core team is what I will take away. If only you could quantify what the relationships that are built mean to the participants, not just focusing on the products. (ScrAPPbook, lead entity)

Whilst it is impossible to measure and quantify the value of this information sharing, such tacit knowledge spillovers are important for SMEs because at little or no cost, they can absorb new ideas and knowledge they would be unlikely to otherwise afford (Bakhshi et al, 2008).

In order to enhance the flow of information between individuals and firms and encourage 'collective learning', networks are important (Antcliff, Saudry and Stuart, 2005) and this highlights the importance of relational rather than purely transactional exchanges in SME formation.

Context-driven Business Modeling



Figure 9 Progressive diagram of emergent business model

An expectedly prominent theme in data collection was the process of developing business models. However, what might not have been expected was how innovative the business modeling would need to be. For Know Sugar, the inter-development of the service blueprint and each distinct element as a flowing, meaningful conversation was prioritized over foregrounding the monetization. It was often presented as a non-profit, community-based service that would learn its monetary potential as it went forward.

It was utterly design-led! Fundamentally what we recognized is the need for policy change in terms of having a positive policy about diabetes rather than a wishy-washy no policy that didn't want to interfere with the food industry... ...It was getting the public to start articulating their concerns in the area and that's where design comes in trying to engage with the public. (Know Sugar, lead entity).

This echoes ScrAPPbook learning that it could only develop the concept case by case, balancing an effective digital platform with authentic, community-based engagement. UAN Wool and Muscle Cake would lean on more traditional business models (luxury food and drink and subscription models respectively), but learnt they would need to appropriate them in

uniquely qualitative ways, as their concepts simply did not exist in their current form.

There is a high degree of uncertainty about why some firms grow and others do not (Mason and Brown, 2010) and existing research regarding SME formation suggest that there is considerable uncertainty with regard to overcoming barriers to development. The context-driven modeling found within DiA challenges some of the traditions of management where modeling is a key method to simplify the complex phenomenon of organizational behaviour. This tends to place a high priority on “key elements that are seen to offer a good representation of the real world”, “the ways these elements interact with each other” and “the outputs produced by these interactions” (Hayes, 2002:71). Design represents more an expertise in the process of modeling (New and Kimble, 2012), which allows emergent, innovative models to be iteratively and creatively represented.

Values-driven Narrative

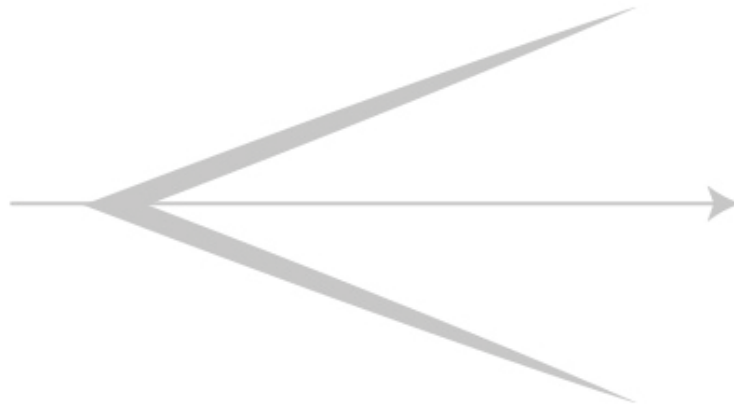


Figure 10 Progressive diagram of expanding narrative

The case examples also used design expertise to capture narratives with input from expert networks and users. Know Sugar showed deft handling of complex materials and subject matter, engaging heavily in a network of policy, powerful industries and health expertise, yet retaining a growing effectiveness in using sugar to engage in changing people's diet habits. Both UAN Wool and ScrAPPbook utilized user feedback to construct early narratives representing their values and unique propositions: UAN Wool articulating the virtues of Scottish wool with healthy sleep; and ScrAPPbook, engaging methods of capturing case studies to instill ownership for whichever community may be using the concept. Muscle Cake proved sensitive to developing a narrative to develop core values that would empower individuals, of which their product was only a part:

We're really looking to find added value through an empowering narrative. (Muscle Cake, partners)

The empathetic aspects of design are emphasized in a "people first" approach to innovation (Serrat, 2010: 2). This openness to engaging with user research and human-centred design can help uncover unarticulated and emergent user needs and, in turn, strengthen a value-driven narrative as was found in many of the case examples. The growing importance of

narrative and design for business is elegantly emphasised by Trocchianesi, Pinardi and De Marco (2011):

Design “qualifies” itself - in a more and more sophisticated way – as a builder of meaning and value, an innovator of shape and functions and an expert of the mise-en-scene. [...] In an era when the perception of a brand, the purchase of a good or the cultural fruition have to turn into memorable events not to get lost, the narrative dimension becomes an essential design driver. (Trocchianesi et al 2011: 67)

Conclusions

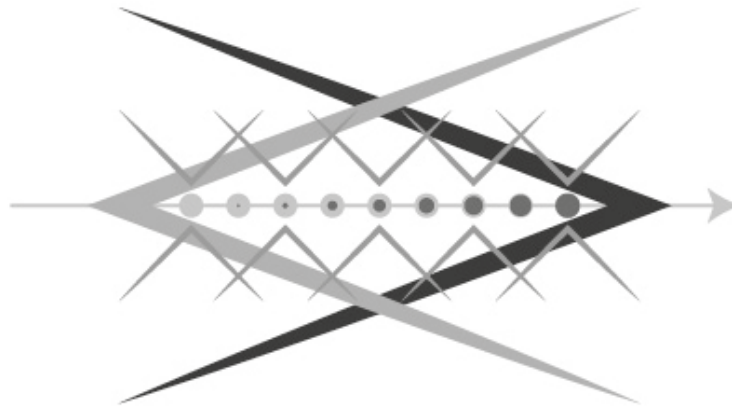


Figure 11 Overlaid progressive diagram of the four presented themes

In this paper we have acknowledged the important role of a vibrant and sustainable SME sector whilst noting some of the challenges faced in their formation and growth. We have examined some of the posited benefits of design-led innovation for the development of SMEs chiefly within the context of KE interventions between HEIs and industry. A case study of AHRC-funded KE hub DiA has been presented with a focus on five key case example businesses funded as part of the project. A thematic analysis was carried out resulting in the identification of four key themes, which, we believe, demonstrate the qualitative value of a design-led approach. These key contributions of design were: meaning-driven differentiation; network-driven enrolment; context-driven business modelling and values-driven narrative.

In emphasizing these more qualitatively identifiable values of design, we concur with Lockwood, Smith and McAra-McWilliam (2012) who recognize “the importance of non-economic goals [...] the need to understand the social goals like creativity, personal satisfaction and freedom” in how we begin to support innovation (Lockwood et al, 2012:749). We argue that meanings and context are fundamental in a design-approach, which takes account of values, ethics and responsibility. Whilst this is commonly identified and theorized in design approaches within social innovation, it is

often neglected in relation to the development of SMEs. We posit that the examples we have outlined illustrate the use of design in ways that can be transformative for company development and sustainability.

The findings show how DiA gave participants opportunities to work collaboratively and co-produce knowledge, allowing collective learning to take place during the process of their business formation. The authors recommend future research that develops and engages these identified processes for design evaluation, as well as their consideration for the future support of SME formation and innovation. This echoes the findings of The Dowling Review, which emphasized the importance of relational rather than purely transactional exchanges. Instead of measuring the value of exchange purely in financial terms and short-term gain, the development of more complex and intangible social contracts and cultures of reciprocity are crucial for innovation. There is broad acknowledgement of the role of relationships to effective KE and innovation, but this has not always correlated with interventions that support long-term partnerships. We concur with the view that, 'there is more to be done to help existing efforts evolve from short-term, project-based collaborations to longer-term partnerships focused on use-inspired research' (BIS, 2015: 5).

This paper has acknowledged further that, whilst evidencing the relationship between design and economic performance is complex, the findings are an example of how in more qualitative ways design has the potential to effectively capture and evaluate its contribution within the complex and diverse situations it engages.

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