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Design Thinking for Social Innovation in Health Care

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Abstract

Design has a potential to envision alternative futures for health care through new forms of innovation. In this paper, we propose a strategic framework for fostering a culture of design thinking for social innovation in health care. Drawing upon the theory of design (and its thinking), in conjunction with global and national health care strategies, and policies, we critically reflect on two pedagogical approaches for enhancing the curriculum in design as a means of discussing the need for new thinking in health (namely Design Sprint and Product Design). Findings to date suggest that new mechanisms of knowledge acquisition, application and exploration are needed to address the complex challenges facing social and health care. Referring to the national health care strategies, connections are made with design thinking, social innovation, health and social care to facilitate a transition from applying design as a process to applying design as a strategy for cultural transformation.

Keywords: design thinking; health care; design sprint; social innovation; strategy

Introduction

This article presents three pedagogical approaches that demonstrate knowledge acquisition, application, exploration and exchange at the interface between design, health and social care at the University of Dundee. Using literature review and co-design projects, it reflects on the role of design sprints as disruptive and collaborative methods for addressing socially complex problems. The overall aim of this article is to propose a strategic framework and mindset for fostering a culture of design thinking for social innovation in health and social care. In doing so, we seek not only to connect design thinking, social innovation, healthcare and wellbeing but to propose a series of tentative steps for applying design as a strategy for transformation in a city-wide context.

Theoretical Framework

The theoretical backdrop is design, as it provides a philosophy and method that educates people to use a combination of different forms of reasoning to approach practical problems and problem solving. It also introduces design-specific activities for addressing complex problems to a wider audience, thereby connecting diverse forms of knowledge exchange within University environments and beyond.

Design can frame the understanding and development of a subject (organization or business) and its associated policies, products, resources and services, serving as an act of leadership in its strategic management (Coulson, 2016). It has a naturally entrepreneurial framework and lives at the intersection of constraint, possibility and contingency; analysing and synthesising different perspectives to offer solutions to indeterminate problems (Valentine, 2004; 2011). It is a culture of action. As a discipline, it is driven by its innate ability to create alternative futures (Buchanan, 2014). From a business and education perspective, there are four distinct ways in which design is currently being used: 1) as an

imaginative act; 2) a cognitive decision-making process; 3) a spirit that permeates an organization, it's culture; and 4) as a way of thinking and acting in the world (Buchanan, 2014).

In this paper, the aforementioned character and distinctive culture of professional design powers Design thinking; it is an attitude (Michlewski, 2015) as much as it is a philosophy and series of strategic tools and operational techniques (Cross, 2011; Fry, 2011; Kimbell, 2014; Martin, 2009). Based on craftsmanship, imagination, simplicity and technological ingenuity, Design thinking is an agent of change; a framework for training and learning to fully embrace uncertainty, ambiguity and complexity in an action orientated manner, where abstract thinking and practical making processes are held in equal measure and high regard. In doing so, it encourages individuals to reframe problem domains and 'seriously play' with ideas to create meaningful propositions, interventions, (Schrage, 2000) and evaluations throughout the process, thereby making a real difference in today's world. Design thinking is a cognitive style, a general theory of design, an organizational resource (Kimbell, 2011) and, a framework for social and cultural transitioning. It involves balancing 'analytical mastery and intuitive originality in a dynamic interplay' (Martin 2009, 6). This is quite opposite to the pervasive positivist world view in health sciences.

Design Thinking for Social Innovation

Design thinking for social innovation is a collaborative approach to solving complex problems where everyone (and not just the designer) designs (Manzini, 2015). In the 21st Century, the phenomenon of social innovation[1] has gathered considerable momentum. This can be attributed to the fact that 'existing structures and policies have found it impossible to crack some of the most pressing issues of our time' (Murray, Caulier-Grice and Mulgan, 2010: 3). A growing number of people are now breaking with routine and experimenting with new, more collaborative ways of working and producing. While social innovation is not new, what is new is the added dimension it is bringing to design, and vice versa. It is a middle-out, centrally connected approach to working on society's biggest challenges (ibid). Design for social innovation requires mindfulness - deep listening, observational and critical evaluation skills, physical and mental agility, humility, resilience and a collective rather than individual approach. It is an open-ended co-design process that relies on dynamic, interconnected communities of people.

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[1] "Social innovations are new solutions (products, services, models, markets, processes etc.) that simultaneously meet a social need (more effectively than existing solutions) and lead to new or improved capabilities and relationships and better use of assets and resources. In other words, social innovations are both good for society and enhance society's capacity to act" http://siresearch.eu/blog/defining-social-innovation

"Social innovation means developing new ideas, services and models to better address social issues. It invites input from public and private actors, including civil society, to improve social services". http://ec.europa.eu/social/main.jsp?catId=1022

Social Innovation is currently stimulating a much-needed cultural change, enabling communities to collectively question their usefulness and their connections with society. It is urging disciplines to critically look and listen to how they collaborate internally with their colleagues and externally with their partners, on both local and global levels. Today, environments and tools and values are rapidly changing. Society is witnessing a pace of change that will historically become recognised as being slow, despite people feeling that the current pace of change is (at times) intense. Through this, we are experiencing cultural change and in design, there is an exigency to understand what this is within the business of Design. As Ezio Manzini notes,

> "In the transition towards a networked and sustainable society, all design is (or should be) a design research activity and should promote sociotechnical experiments.
>
> This transition is a broad, complex *social learning process*, by which everything that belongs to the mainstream way of thinking and behaving in the old world will have to be reinvented: from everyday life to the very idea of well-being." (Manzini 2015, 53-54)

In this article, we seek in part, to better understand this cultural transitioning in design by situating it in the context of health and social care, and by developing new coalitions to talk, scope and seriously play with the issues. A prominent factor for consideration was the approach to learning and problem solving employed by people, as different disciplines and cultures can become barriers to successfully working together.

Public Healthcare and Wellbeing

Health and wellbeing are complex phenomena that require innovative approaches across a spectrum of services. Over the past decades, there has been a shift in public health towards focusing on the prevention of and health promotion geared towards non-communicable diseases and long-term conditions such as cancer, stroke, cardiovascular disease and diabetes (Maher, Ford and Unwin, 2012). Many of these conditions are also the result of lifestyle habits formed over the course of individuals lives but also between generations. Moreover, there has been substantial evidence that links health risk behaviours to socioeconomic and structural factors, such as income inequalities, education, living environment. The latter also indicates that addressing the challenges associated with these conditions cannot rely simply on individual behaviour change models but require a multi-layered systemic approach and may even necessitate health system redesign (Nishtar and Ralston, 2013).

There is also growing recognition that paternalistic, professionally driven deficit focused models of addressing health challenges are inadequate. In the 1970s Antonovsky formulated an alternative approach to promoting health, emphasising the 'meaning-focused' conditions for salutogenesis

(Antonovsky, 1996) on a continuum of health, rather than a dichotomy between good and poor health. He also opposed simplistic disease causation and classification (Lindström and Ericsson, 2006). The salutogenetic approach is also reflected in many recent public health frameworks, beginning with the Ottawa Charter of 1986: 'Health promotion is the process which enables people to gain control over their health determinants in order to improve their health and thereby be able to live an active and productive life' (WHO, 1986). The Charter views people as active agents rather than just 'victims' of disease. It shifts agency from professional groups to populations and recognises that people hold individual and as community's collective assets that can be harnessed to create health promoting environments.[2]

In addition, at the turn of the Millennium, focus shifted away from absolute 'health' towards the conditions for health and wellbeing. Some of the work initially focused on what maximises 'happiness' in populations (LSE happiness index) but more recently, it has seen a greater focus on conditions that help individuals and communities flourish. Seligman (2011) and Keyes (2002) have examined the key components for human flourishing. Seligman summarises these using the acronym PERMA, which reflects 'positive emotions' (P), 'engagement' (E), 'positive relationships' (R) 'meaning' (M) and 'achievement' (A). He contends that people live overall flourishing lives if these components are mostly pointing towards a positive balance. The question is, how can we achieve this? With locating public health in local authorities, rather than purely in the health service a shift has occurred in how health and health care responsibilities are being viewed. Similarly, with the integration of health and social care there is a practical response to addressing the multiple levels of promoting health in a more systemic fashion.

Healthcare and Wellbeing's Traditional Linear Approach to Problem Solving
The tradition in healthcare is an evidence-based practice paradigm (EBP) with linear hierarchies of scientific evidence. Today it is not fit for purpose to adequately reflect the complexities involved in what constitutes health and illness. Evidence-based medicine (EBM), a term promoted by David Sackett and his colleagues in the 1990s is defined as "the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients' (Sackett et al 1996, 71).

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[2] This shift has been reflected in Scottish public health over the past decade as well (Glasgow Centre for Population Health, 2011). The 'AfterNow' Project, directed by Professor Phil Hanlon with many Scottish collaborators has examined the impact of modern living on health and wellbeing. Methodologically, the AfterNow Project moves away from reductionist epidemiological techniques and draws on a range contextually sensitive narrative approaches. Its intention is to make complexity visible and to move away from individual health behavior change towards an analysis of and modification of environmental, cultural and economic factors in population health and wellbeing (Hanlon & Carlisle, 2012).

Much of the research evidence generated under highly controlled conditions lacks in ecological validity or representativeness of the population. Children, older people, ethnic and linguistic minorities, people with disabilities are systematically underrepresented in health-related research. Moreover, research rarely focuses on the complexities as they present themselves for most people. For example, it is more likely that people over 65 manage more than one health condition, take more than one set of medicines or find it difficult to meet the requirements of a strict research protocol due to conflicting life events and activities.

Evidence-based medicine has produced standards and enhanced comparability of research findings but it has done this at the expense of ignoring the contextual complexities and variations for most health-related outcomes. Children, older people, people with disabilities, people whose first language is not the one predominantly spoken by the investigators, people with mental health conditions, people living in rural areas, homeless people, people with limited literacy skills have been systematically excluded from health-related research repeatedly. The result is 'sanitised samples' with little semblance or representativeness of the population at large constitute the basis for many effective studies of interventions.

Much of clinical intervention research is based on reductionist forms of inquiry that seek to limit and control factors that may influence outcomes. Outcomes are mostly defined in narrow terms and the variables that are assumed to change these outcomes are restricted to the careful selection of a few based on a narrowly conceived theory or statistical considerations. Recent years have seen an expansion and greater acceptance of qualitative ethnographic and phenomenological research and mixed method approaches in applied health services research, which have complemented the quantitative methods of inquiry. Skepticism, however, remains. Holistic, context-sensitive and system-focused research are still the exception. And, moreover, user-centredness - while advocated in health policy statements - is still rare in clinical research, as is the use of a more holistic approach to both research as well as service design (Gabbay and LeMay, 2011). In short, appropriate responses to complex problems require that clinical intervention research embrace ambiguity, heterogeneity and experiential difference, thus the need for more design thinking.

Health sciences need to recognize that creative, effective and appropriate mechanisms of knowledge integration and mobilization are needed to deliver solutions to complex problems. And most critically, the sharing of forms of 'knowledge' needs to involve the service user or beneficiary. Person-centredness has been recently evoked in how health sciences ought to deliver health care but it is linked to a concept with much longer tradition in the field of design where it is understood as user-centredness.

With changes and challenges in healthcare and wellbeing, a leaning towards more inclusion of patient centred care and a move away from (an over) reliance on linear models of problems solving, there is opportunity to consider design as a model for innovation in healthcare and wellbeing, especially social innovation. Before looking at the examples of social innovation as a connecting framework for better knowledge exchange (between different forms of research inquiry and disparate networks in a City and across a University), it is important to acknowledge the role of national health and social care strategies, as policy also guides how progress is made in partnership development.

Current and Future Scottish Health and Social Care Strategies
The current global and national health and social care models of service provision are usually based on a "top down" structure, where decision making is regularly carried out by politicians, managers and senior care workers, often without direct and meaning full input from service users. These models of service provision are also very "silo" like in structure, and therefore, result in financial and service provision inefficiencies. However, silo structures and fragmented working are now being challenged.

The Scottish government document - A National Clinical Strategy for Scotland 2015 - published in February 2016 outlined the need for transformational change in NHS Scotland to meet people's health and social care needs by 2020 and beyond. This strategy outlines key areas of quality, patient safety, clinical effectiveness and person-centred care, guided by evidence where available. It recognises the central importance of the role of the individual people using services, their carers and their communities in providing support. The National Clinical Strategy is managed by Healthcare Improvement Scotland (HIS) and aims to improve population health and wellbeing, as well as the individual's experience and outcome of illness. The National strategy proposes future services that will be based around supporting people, rather than single disease pathways, with a solid foundation of integrated health and social care services based on new models of community-based provision.

This National Clinical Strategy is set against the backdrop of a revolutionary set of proposals made recently by the Scottish Chief Medical Officer (CMO), Catherine Calderwood's report, titled "Realistic Medicine" (Scottish Government's Chief Medical Officer's Annual Report 2014-15). The CMO's report focuses on six key areas. These include: (1) a more personalised approach to care; (2) creating a style of shared decision making; (3) a challenge to reduce unnecessary variation in practice and clinical outcomes; (4) a challenge to reduce harm and waste created by current over investigation and overtreatment of patients; (5) ways to manage risk better; and (6) a challenge for healthcare workers to become improvers and innovators.

Tayside, in which the City of Dundee sits, has recently formed the first Academic Health Science Centre in Scotland (AHSC), based on a globally adopted concept for delivering healthcare improvement.

AHSC's share the tripartite mission of undertaking high quality research, educating health professionals and achieving high standards of clinical care. AHSC also aim to connect NHS and academic organisations, local authorities, the third sector and industry, and are the catalysts that create the right conditions to facilitate change across whole health and social care economies, with a clear focus on improving outcomes for patients. The 'Academic Health Science Partnership in Tayside' (AHSP) is a partnership formed between NHS Tayside and the University of Dundee (UOD) and has an outward facing principle of engagement with staff, patients and external organisations. AHSP is developing themes of Design and Innovation in Healthcare and Digital Healthcare Technologies in a Community Setting. The AHSP framework has nurtured and mobilised a series of new Healthcare Design Thinking related activity in Tayside. For example, we have introduced healthcare education events based on *Service Design* where the focus is on learning from and together with patients with head and neck cancer.[3]

Education As A Context For Design Thinking For Social Innovation In Health Care

Designing 'Design Sprints'

The act of designing a design sprint is presented as a form of design thinking and a way of facilitating how education might inspire and mobilize an alternative method for identifying and solving complex healthcare and wellbeing problems[4]. Here, health care issues are presented as social and cultural challenges rather than medical ones, where people's behaviours and mind-sets are explored through design thinking. There are [to date], 15 components or activities to our DESIGN SPRINT: 1. knowledge transfer; 2. individual creativity (fuelled by knowledge transfer of facts and imagination); 3. brainstorming; 4. energizers; 5. collaborative knowledge exchange; 6. ideation; 7. ethnographic interviewing; 8. En masse feed forward sessions with open reflective conversations; 9. prototyping; 10. exposition (of the emerging design processes and sharing of key insights); 11. take down and tidy up (as it can be a very messy activity); 12. Pecha kutcha; 13. teamwork, 14. assessment and, 15. celebration. (Figure 1).

[INSERT FIGURE 1 HERE]

Figure 1: visual symbols of the 15 components to this Design Sprint which (to date) have been identified as the constituent parts. They are activities created and strategically placed throughout each stage of process, in relation to the subject being explored and the focus of

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[3] Breaking from healthcare tradition, the introduction of service design training workshops has invited patients to contribute their experience and share education as equal partners with a team of healthcare professionals. They uncovered a range of unmet needs experienced by patients, not previously identified by doctors and nurses. The value of service design identified thus far, is it can allow junior and senior medical and clerical staff to explore their own hospital environment through the eyes of a service user. Techniques such as persona's, service safari's, service journeys and future-forecasting have helped to begin reconsidering service redesign in terms of administration, hospital entrance and surgical ward.

[4] The Design Sprint was explored as framework for introducing design thinking, social innovation and healthcare in level two undergraduate design education (within in a traditional Art School based educational system for Design and Craft students, namely jewellery, textile, interior and environmental design).

investigation.[5]

Five DESIGN SPRINTS (each of a 5-day duration and managed over the course of one working week) were conducted with large interdisciplinary groups of novice designers (with 75 participants in each). Participant awareness is raised from multiple perspectives and expertise in relation to the subject and focus of the Design Sprint e.g. mental health, ageing population, breast cancer. With breast cancer for example, direct expertise from the perspective of a plastic surgeon, a breast cancer patient in remission, a counsellor, designers, ethnographers and scientists were co-designed into the process). The DESIGN SPRINT was iteratively developed after each event and, with input from each group of 75 participants and critical conversations with six healthcare experts. The DESIGN SPRINT sought to nurture an understanding of design for innovation and develop skills in design research using methods and techniques that place people's individual needs at the heart of both the problem finding and problem-solving process. It explored the ways in which design affects the world, positively or adversely, and challenged people's current understanding of the value and values of contemporary design.

The five days in this DESIGN SPRINT were each dedicated to a phase of problem identification and problem solving, and the whole experience was designed to nurture both theoretical and practical knowledge of agile management, design thinking, empathy, resilience and teamwork. It was a purposefully intensive way of collaborative working for concept development.

[INSERT FIGURE 2 HERE]

Figure 2: A visualization of this Design Sprint as a 5-step concept development practice. It is an inherently creative process (symbolised by squiggly, messy ball of activity) yet the underpinning purpose is simply to engage in an iterative process of learning and ideation (symbolised by a looping process). Day 1 is concerned with *Understanding*: problem finding and the development of teamwork. Day 2 is with *Diverging*: continued investigation into problem understanding through prototyping and the development of knowledge driven decision making. Day 3 is *Converging*: problem articulation through prototyping and an understanding of human-centred design with ethnographic interviewing. Day 4 is *Refining* the concept through testing and, developing the ability to communicate concept-driven innovation. Day five is concerned with *Communication*: knowledge sharing and the value of the DESIGN SPRINT as a method for achieving new forms of innovation. Through physical engagement in this Design Sprint, an understanding of both the theory and practice of design thinking, prototyping, agile management, research techniques, critical thinking, empathy and resilience are developed.

[INSERT FIGURE 3 HERE]

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[5] There are operational issues attached to the constituent parts of this Design Sprint, which point to deeper understanding of the underlying conditions for its success, the importance of, and approach to facilitation, as well as the training of novice facilitators. To address these topics fully would require more space than is available here and more importantly, it would draw attention away from a key issue for this paper, which is positioning design thinking as a strategic framework for social and cultural transition.

Figure 3: A visual overview this DESIGN SPRINT: a designed knowledge exchange process for social innovation. It was iteratively developed through the delivery of five DESIGN SPRINTs (2013-2016). It seeks to communicates an intensive concept development journey, sharing its dynamic nature while offering insight into how visualization is used to nurture innovation and guide participants during a process which is filled with ambiguity and uncertainty. What is difficult to discern from this visual is where and when the diverse range of expertise was included. In practice, each day focused on one new knowledge perspective as well as one phase of the concept development design process– for example with breast cancer, that could be the knowledge and experience of a plastic surgeon, or a cancer patient in remission, an ethnographer or designer (It was included at the beginning of each session and peppered throughout conversations when facilitating each team's work).

An integral aspect of the iterative development of a Design Sprint as a knowledge exchange process for product, service and social innovation, was user engagement and feedback. Evaluation of the design was conducted with participants, daily and on completion of its delivery. Data was collected via a Likert scale survey, gathering detail about the design from individual participant's perspectives. Participant feedback averaged 67% over the five DESIGN SPRINTS and indicated participants enjoyed the intensive learning experience and knowledge exchange process, with the majority 'very happy' (39%), and the remaining selecting 'happy' (30%) or 'loved it' (26%) with only 4% indicating they were unsure. This data enabled immediate reaction to the experience, its design and outcome(s), and helped ascertain the degree to which the sequence, diversity and volume of activities supported the overall objectives of knowledge exchange and design for innovation via a DESIGN SPRINT. The data also enabled a review of how individual participants felt about a specific day because the survey was divided into daily segments with each day having an easily identified part one and part two. In addition, each of part of each day had identifiable activities upon which the participants were commenting. From this, Day 2 was deemed the most challenging by 68%, Days 3 and 4 were deemed a turning point by 80% and Day 5 was a revelation and an inspiration despite being an intensely focused end to the process by 90% in that the quantity and quality of design work that was created surpassed participant's expectation in so far as being given a new methodology, a new subject and form of professional practice to learn. The result of these findings are a framework whereby (i) a minimum of 3 qualified and experienced facilitators support large groups (of 75+ individuals that create 12 teams of 6-7 individuals) for the duration of the entire event as this offers consistency and consolidates confidence among the teams, (ii) the inclusion of a minimum of 4 perspectives or knowledge basis on a subject to ensure a problem is viewed from multiple perspectives thereby enabling a more fully understood and a focus for concept development can be collectively identified, (iii) the physical demonstration of prototyping by facilitators during team working is incorporated as often as possible, both as a way of teaching and learning the concept development design process but also as a way of testing how aspects of a concept can be developed together, and how different ideas can be experienced by different people impacted by social innovation, (iv) the environment in which a Design Sprint is held is mindfully designed and set up prior to its deliver whereby close attention to detail is paid towards the amount of natural light, the volume of space for people to move freely during the event, the provision of materials to support prototyping (large and small scale), adequate internet provision, the quality of audio and digital

technology to present information, the form and quality of the teaching and learning content (i.e. the knowledge being shared), adequate space and time for social conversations and interactions and last but no means least (v) the inclusion of food at strategic points (both morning and afternoon) to facilitate the social dimension of everyday as well as the whole concept development process.

Embedding the 'Social' in Product Design Education

'Social Digital' is one of four academic groupings within Duncan of Jordanstone College of Art and Design at the University of Dundee comprising of two programmes: Product Design and Digital Interaction Design. They share a unique learning philosophy that focuses on design thinking and making processes to allow students to develop socially relevant design responses in a world where digital technologies are changing our lives. Staff and students often work closely with stakeholders in the community and projects are largely driven from insights gathered using a range of people-centred design methods. The pedagogy introduces students to historical or contemporary agendas through designed object(s) as a way of critically inquiring into societal, technological or design issues. It promotes active learning and collaboration through engaging with and understanding people, and an approach to designing with digital technologies through playful thinking and making. The outcomes are typically highly resolved 'experienced' prototypes that aid the communication of the design idea with the proposition anchored within a rich societal context.

An increasing number of students in their final undergraduate (honours) year focus on designing for ageing populations, people with disabilities (particularly cognitive, physical and communicative) and general healthcare services. Here we present one project where a student has used design thinking to address a social issue through a product innovation (in the form of a toolkit), drawing upon participatory and co-design methodologies to make a positive contribution to people's everyday lives within a health and social care context.

As an intermediary between healthcare professionals and patients and their carers our students must co-design with both stakeholders, bringing their respective expertise, experience and needs, to create a novel solution. A "user-sensitive inclusive manner" (Lim and Newell, 2016 p.164), involves deep listening, observation and design-based activities such as empathy and journey mapping to understand the context and idiosyncrasies of individuals. Besides creating personalised novel solutions another benefit of involving stakeholders in the design process is that it enables people to explore with ideas and feel that they are "active agents" and have a control over their own health determinants.

Unfold (Student Project, 2015)

'Unfold' was an undergraduate honours degree year project based around social health issues. The focus was dementia and its carers because of the student's personal experience with a family member suffering from dementia and their relation to the carer. The brief was to find how design might allow carers to share experiences and feel empowered, thereby facilitating personal growth and building upon individual resilience.

The student's design process engaged with carers and clinical and social care experts to broaden their personal understanding of dementia and the experience of other carers, and about expert's experiences of working with carers and the challenges they face. Conducting a series of workshop with carers and experts and creating empathy and journey maps (before diagnosis, the diagnosis and post-diagnosis) with them, enabled an understanding of the issues and experiences faced by carers. This subsequently led to the concept Unfold, a toolkit to aid local carers in sharing their experiences of caring for someone with dementia. The toolkit consisted of a journal to record their experiences, contacts of local support (Figure 4) and access to an online platform where they can share their experiences by sharing thoughts on their journey, asking questions and providing support to other local carers (Figure 5).

[INSERT FIGURE 4 HERE]

Figure 5: Unfold is a codesigned toolkit to aid local carers in sharing their experiences of caring for someone with dementia. One aspect of the toolkit was the inclusion of clear communication of the contact details of local support

[INSERT FIGURE 5 HERE]

Figure 6: An app was designed as part of Unfold, as a means of offering support to Other Local Carers

Throughout the development phase of 'Unfold', the post-diagnostic support group and dementia advisors was invited to engage with feedback. The product design was approached with care and detail, for example, sourcing appropriate material for the journal cover with the right weight and texture of paper to bind with it. Sensitivity to tone of voice of the questions used in the journal and online platform to prompt a carer to share their experiences. With the completion of the final prototype, support groups and advisors were invited to test and evaluate it, from which positive feedback was given.

Design: Communication, Education and Healthcare

There is growing evidence in the literature that participatory co-design methods are used to improve health and other public-sector practices. Experience-based Co-Design (EBCD) in particular has drawn attention from health and design professionals alike. The approach involves a six-stage process over a

9-12-month period during which staff, patients and carers reflect on experiences with a health care service and which triggers a systematic data collection and improvement process (Donetto, Pierri, Tsianakas Donetto and Robert, 2015). Tsianakas and Robert (2014) reviewed ongoing and planned EBCD projects and identified more than 80 projects in a broad range of clinical areas (e.g. emergency services, cancer care, drug and alcohol treatment, paediatric services and mental health) at the time of publication. However, thus far empirical publications resulting from those projects are limited and at least in the UK the notion of what is understood by co-design varies greatly (Donetto et al, 2015). As Greenhalgh (2017) points out a challenge for EBCD exists in terms of how this process of shared experiences that leads to service redesign recommendations can be connected with robust systematic research evidence.

Another recent example of applying design thinking, especially the Design Sprint approach in public health can be found in the study by Vechakul, Shrimali and Sandhu (2015) which focused on reducing health inequities in the form of infant mortality rates in three US cities. The so-called Best Babies Zone (BBZ) multi-year, multi-site initiative involved a 12-week pilot Design sprint with 14 professionals of nine organisations in Oakland, California. The project aimed to address the social determinants or social and economic conditions that drive health inequities at the neighbourhood level. The Design sprint involved neighbourhood walks, interviews, brainstorming sessions, prototyping and group planning discussions. One outcome was the East Oakland innovators programme in which local community residents learned to apply Human Centred Design principles and strategies to create neighbourhood level solutions for the challenges that they identified. The latter was critical to devolve power and ownership from professional experts to the local community.

Design is a proposition for change, an invention maker and-or a management process for new products, services, systems and experiences. In the first project described above, design thinking was combined with the method of a Sprint to create a Design Sprint. It draws on the theory of a Sprint which overturns traditional hierarchical management structures and draws on improvisational change model of Orlinkowski and Hofman (1997 cited in Wastell, Kawaelk and Willetts, 2001). In combining design thinking with agile management and teamwork, the research sought to understand how to harness the optimum energy of a diverse group of people who have just met each other to work on a subject previously uninvestigated by them, and mobilize this to create meaningful solutions. In this Design Sprint model, strong emphasis was placed on innovation through participation, learning and knowledge management, failing fast and failing often through prototyping and multiple reflective group conversations. It is drawing on design method theories (Arnheim, 1969; Cross, 1999; Valentine, 2013) and how professional design companies are framing this relatively new way of working (such as IDEO, Frog, UsCreate, and LiveWork).

Our Design Sprint is presented as a practical example of, 1) Design thinking as a framework for mobilizing people to empathetically conceive of alternative models of interdisciplinary teamwork, as well as, 2) offering people who are new to Design and-or Design thinking, a way of learning about design as a strategy for change. Our Design Sprint is also developed through Design thinking, specifically its iterative manner, direct engagement with the people who use it to garner feedback on its performance and relevance, and its emphasis on generating insight(s) rather than solving problems (although the process may result in problems being solved, it is not the primary activity).

In the two design projects cited in this paper, while operationally different they are, in principle, the same; they manage *concept development* with groups of people, with varying expertise, knowledge and personalities is driven by a concern for the transformation in new, ambitious collaborative practices and their associated creative process(es). It is influenced by a concern for the impact of change and what this may mean for future ways of working. What does the designer of the future look like? What sort of skills development will design need in a range of occupations and contexts? And, if global issues such as Health Equality, Mental Health, Refugees, AMR, Poverty require a paradigmatic change in how we think, what can design attitude, skills and knowledge bring to new interdisciplinary ways of workings, and areas not normally labelled "design"? What does the future health and social care profession look like? What is a legacy of design thinking for social innovation in healthcare? How should we collaborate and codesign our future for the global challenges within health and social care?

Closing Thoughts

In this article, we have explored design thinking as a strategy for social innovation; used the City of Dundee as an illustration of the problems of health care; described how the educational context is being used to address how we can achieve a sustainable transformation by embedding design thinking into health and social care, and embedding global health and social challenges into design. We have championed diversity and sought to present an approach where collaboration and knowledge exchange can happen at different levels of intensity, with various actors or stakeholders and, for different social problems and purposes. We can see that on one level design can be a service provider in health and social care settings. For design to move beyond this and be used as an integrator to increase, not only knowledge acquisition, exploration and exchange, internally and externally, but to imagine new futures for healthcare, then design as a strategy for social transformation must foster this relationship moving forward.

We ask: What's the promise in 10 years? The tensions and challenges that exists in this space, that we have identified, need to be addressed. They include power, hierarchy, language, tradition and mindset. The region of Tayside, Scotland currently has collaboration between healthcare and design, bringing

together science, art, design, computing, engineering and technologies to provide for a unique infrastructure and co-design expertise to build on and interpret the Scottish "National Clinical strategy" and particularly the CMO's 'Realistic Medicine' proposals. It is suggested that all six key areas (in the National Clinical strategy) can be supported and developed by and through design (its thinking and methodologies such as a Design Sprint) in the following ways:

1. **A more personalised approach to care** - drawing on inclusive design methodologies such as user-centered design and participatory design. Design can offer healthcare and wellbeing a means with which to learn how to personalise care and develop better support in a community setting.
2. **Creating a style of shared decision making** – moving to a style of shared decision making that is based on a balance of quantitative evidence based medicine and qualitative quality of life principles. Design can play an important role in bringing people together to share their knowledge and experience to create a common vision.
3. **A challenge to reduce unnecessary variation in practice and clinical outcomes** – drawing on patient's personal experience and journeys through healthcare systems. Design as a strategy for service innovation can allow people from different knowledge domains the opportunity to experience and reflect on possible variation in practice as well as the management and interpretation of quantitative and qualitative patient data.
4. **A challenge to reduce harm and waste created by current over-investigation and overtreatment of patients** – there is potential for introducing the concept of design for sustainability into healthcare to reduce costs. The iterative manner that methods, such as user centered engagement, empathy and user experience mapping could be useful in helping to develop an in-depth understanding of patient's needs through to implementation and evaluation of the impacts of change.
5. **Ways to manage risk better** – design can be viewed as a systems integrator, with scaled linking at all levels, leading to improved communication methodologies, particularly in areas of patient disability or where language and cultural barriers may exist.
6. **A challenge for healthcare workers to become improvers and innovators** – adopting design as a philosophy for working together to learn together and co-create in new ways, thereby empowering people and transforming lives.

References

Antonovsky, A. 1996. The salutogenic model as a theory to guide health promotion. *Health Promotion International 11*(1), 11-18.

Arnheim, R. 1969. *Visual Thinking*. Berkeley, Los Angeles and London: University of California Press.

Brown, T. 2005. Strategy by Design, *Fast Company*, 95, pp. 52-54.

Bruce, F-S. and Baxter, S-H. 2013. The imaginative use of fictional bio-prototypes. In Valentine, L. (Ed.) *Prototype: Design & Craft in the 21st Century.* London: Berg Publishers.

Buchanan, R. 2014. Keynote Address: Leading Design: Managing the Challenge of Innovation, *19th DMI: Academic Design Management Conference,* London 2–4 September 2014.

Cross, N. 1999. Natural Intelligence in Design. *Design Studies*, 20, 1. pp25-39

Cross, N. 2011. *Design Thinking: understanding how designers think and work*. Oxford; New York: Berg Publishers.

Coulson, S. 2016. *Residencies with Residence: a case for pragmatism in design-led concept development*. Unpublished Doctoral Thesis, University of Dundee.

Donetto, S, Pierri, P, Tsianakas, V and Robert, G. 2015. Experience-based Co-Design and Healthcare Improvement: Realizing Participatory Design in the Public Health Sector. *The Design Journal*, 18(2), 227-228

Donetto S, Tsianakas, V, and Robert, G. 2014. Using Experience-based Co-design (EBCD) to Improve the Quality of Healthcare: Mapping Where We Are Now and Establishing Future Directions. London: King's College London. https://www.kcl.ac.uk/nursing/research/nnru/publications/reports/ebcd-where-are-we-now-report.pdf (accessed 24/07/2017)

Fry, T. 2011. *Design as Politics*. Oxford; New York: Berg Publishers.

Gabbay, J and LeMay, A. 2011. *Practice-Based Evidence for Healthcare. Clinical Mindlines*. Abingdon: Routledge.

Glasgow Centre for Population Health (GCPH) 2011. *Briefing Paper. Asset based approaches for health improvement: redressing the balance*. http://www.gcph.co.uk/assets/0000/2627/GCPH_Briefing_Paper_CS9web.pdf

Groah, S, Libin, A, Lauderdale, M, Kroll, T, DeJong G and Hsieh, J. 2009. Beyond the Evidence-Based Practice Paradigm to Achieve Best Practice in Rehabilitation Medicine: A Clinical Review. *Physical Medicine & Rehabilitation,*1(10), 941-950.

Greenhalgh, T. 2018. *How to implement evidence-based healthcare*. Oxford: Wiley-Blackwell.

Hanlon, P and Carlisle, S. 2012. *AfterNow. What next for a health Scotland*? Argyll: Argyll Publishing.

Kimbell, L. 2011. Rethinking Design Thinking: Part 1. *Design and Culture*, Volume 3, Issue 3, pp 285-306.

Kimbell, L. 2014. *The Service Innovation Handbook: action orientated creative thinking toolkit for service organizations*. Amsterdam: BIS Publishers.

Keyes, CLM. 2002. The Mental Health Continuum: From Languishing to Flourishing in Life. *Journal of Health and Social Research, 43*, 207-222.

Lim, C.S.C. and Newell, A.F. 2016 User-Sensitive Inclusive Design For Technology in Everyday Life. In Kwon, S. (Ed.) *Gerontechnology: Research, Practice and Principles in the Field of Technology and Aging.* New York: Springer

Lindström, B and Eriksson, M. 2006. Contextualizing salutogenesis and Antonovsky in public health development. *Health Promot Int. 21*(3):238-44.

Maher D, Ford N, Unwin N. 2012. Priorities for developing countries in the global response to non-communicable diseases. *Globalisation and Health, 8*: 14 DOI: 10.1186/1744-8603-8-14

Martin, R. 2009. *Design of Business: Why Design Thinking is the Next Competitive Advantage.* Boston: Harvard Business School Press.

Michlewski, K. 2015. *Design Attitude*. Surray, UK: Gower Publishing

Murray, R. Caulier-Grice, J. and Mulgan, G. 2010. *The Open Book of Social Innovation*. UK: Nesta and The Young Foundation

Manzini, E. 2015. *Design, When Everyone Designs: an introduction to design for social innovation*. Cambridge, Massachusetts; London, England: The MIT Press

Manzini, E. 2016. Design Culture and Dialogic Design. *Design Issues*. Volume 32, Number 1 Wibter 2016. Pp 52-59.

Nishtar, S and Ralston, J. (2013). Can human resources for health in the context of noncommunicable disease control be a lever for health system changes? *Bulletin of the World Health Organization;91*:895-896. doi: http://dx.doi.org/10.2471/BLT.13.118711

Orlinkowski and Hofman (1997) cited in Wastell, D, Kawaelk, P and Willetts, M. (2001) Designing Alignment And Improvising Change: Experiences In The Public Sector Using The Sprint Methodology. *The 9th European Conference on Information Systems* Bled, Slovenia, June 27-29, 2001 http://aisel.aisnet.org/cgi/viewcontent.cgi?article=1121&context=ecis2001 Accessed 9 November 2015.

Sackett, DL, Rosenberg WM, Gray JA, Haynes RB, Richardson, WS. 1996. Evidence based medicine: what it is and what it isn't. *BMJ 13*;312(7023):71-2.

Scottish Government (2016). The Chief Medical Officer Annual Report 2014 -2015 explores the challenges that face doctors today. http://www.gov.scot/Publications/2016/01/3745/0

Seligman, M. 2011. *Flourish: A Visionary New Understanding of Happiness and Well-Being*. New York: Simon & Schuster.

Schrage, M-D. (2000) *Serious Play: How the World's Best Companies Simulate to Innovate.* Boston: Harvard Business School Press.

Valentine, L. 2011. Craft as a Form of Mindful Inquiry, in *The Design Journal*, Volume 14, Issue 3, pp 283-306.

Valentine, L. [Ed.] (2013). *Prototype: Design and craft in the twenty-first century*. London; New York; New Delhi; Sydney: Bloomsbury.

Vechakul J, Patel Shrimali B and Sandhu, J. 2015. Human-Centred Design as an Approach for Placed-Based Innovation in Public Health: A Case Study from Oakland, California. *Maternal and Child Health Journal*, 19, 2552-2559.

WHO (1986). The Ottawa Charter for Health Promotion. http://www.who.int/healthpromotion/conferences/previous/ottawa/en/