

Problem framing expertise in public and social innovation

Abstract: Public and social sector organisations are increasingly adopting innovation as a way to address complex societal problem situations. Design is one of the practices that has been acknowledged to contribute to public and social innovation. However, to generate impact, this design practice needs to be adapted to this new context. This study investigates the practices of five public and social innovation agencies and how they have adapted design to address complex societal problem situations. The study specifically zooms in on the core practice of problem framing. Through a case study of one project within each of the five innovation agencies, non-linear patterns were identified of how multiple frames evolved within each of the case studies through co-evolution of the problem and solution space. The study furthermore shows how the practice is adapted to complex societal problem situations by the way the framing is driven by systemic design principles, the way it pursues multiple solutions and problem frames, and the various research and thinking methods which align with the complex nature of societal problems. I argue that such practices require high-level expertise, and that capability building in public and social innovation should consider these emerging practices and levels of expertise.

Keywords: social innovation, complexity, design practice, framing, design expertise

Introduction

Public and social institutions have a mandate to invest scarce resources to deliver value for the public and for society. They therefore play a key role in addressing the societal problem situations¹ the world is facing. The

¹ In this paper I adopt the term ‘complex problem situations’ to recognize that problems in complex systems are interconnected.

nature of these problems has been described as being complex, interconnected, and dynamic², which requires a new approach and practice³ that is commonly referred to as public and social innovation⁴.

When innovating in complex contexts, traditional reductionist and determinist approaches, as currently favoured in public and social institutions, are unlikely to have the intended effect. These approaches reduce problem situations to smaller problems, that can then each be solved using inductive and deductive ‘evidence-based’ approaches, and which can subsequently be synthesised to create an overall solution to the problem in deterministic and predictable ways. Such rational ways of problem solving might work for complicated contexts, as explained by Snowden and Boone (2007), but do not work for complex contexts. Snowden and Boone explain: “most situations and decisions in organisations are complex because some major change [...] introduced unpredictability and flux. In this domain, we can understand why things happen only *in retrospect*. [...] This is why [leaders] need to probe first, then sense and then respond.” (p74). They refer to this as a ‘safe to fail experiment’. Various design scholars⁵ have argued that design practice supports this experimental aspect of innovating for complex societal problem situations.

This has also been acknowledged by public and social institutions, which has led to an increasing use of design practices in public and social sector organisations. A series of case studies by the UK Design Council (2013) showed that design contributes to public and social innovation by integrating analysis, solution and implementation; looking at the entire system to redefine the problem from the ground up; starting by understanding user needs; testing iteratively to prevent expensive and risky pilots; and engaging teams and departments in collaboration across silos. While design has shown to be successful in ‘service design’, its impact in more open and complex domains is still limited⁶. In this latter context, the focus of designers on complexity requires a transdisciplinary approach⁷, which transcends individual disciplines. This means that design for public

² See for example Dorst, Kees. *Frame Innovation; Create New Thinking by Design*. Design Thinking, Design Theory. Edited by Ken Friedman and Erik Stolterman Cambridge, Massachusetts: The MIT Press, 2015; Norman, Donald A., and P. J. Stappers. "Designx: Complex Sociotechnical Systems." *She Ji: The Journal of Design, Economics, and Innovation* 1, no. 2 (2015): 83 - 106.

³ Public sector organisations recognise that traditional government tools and approaches to addressing these challenges may not provide solutions, and that new approaches towards public sector innovation are required (Daglio, Gerson, & Kitchen, 2014; Sørensen & Torfing, 2012).

⁴ Bason (2010) defines public sector innovation as the process of creating new ideas and turning them into value for society. Hartley (2005) defines innovation in the public sector considers the design and implementation of products, services, processes, positions, strategies, governance and rhetoric. The desired result of these innovations is the creation of ‘public value’, including service quality, societal outcomes (reduced crime, educational attainment), and trust, legitimacy, and confidence in the government (Kelly, Mulgan, & Muers, 2002; Vigoda-Gadot, Shoham, Schwabsky, & Ruvio, 2008).

⁵ See for examples of the application of design to complex societal problems Norman, Donald A., and P. J. Stappers. "Designx: Complex Sociotechnical Systems." *She Ji: The Journal of Design, Economics, and Innovation* 1, no. 2 (2015): 83 - 106.; Dorst, Kees. "The Core of 'Design Thinking' and Its Application." *Design Studies* 32, no. 6 (2011): 521-32.

⁶ Design for complex societal problems is referred to as ‘fourth order design’ (Buchanan, R. "Wicked Problems in Design Thinking." *Design Issues* 8, no. 2 (1992): 5-21.), ‘design 4.0’ (Jones, Peter, and G.K. van Patter. *Design 1.0, 2.0, 3.0, 4.0: The Rise of Visual Sensemaking*. New York: NextDesign Leadership Institute, 2009., and ‘designX’ (Norman, Donald A., and P. J. Stappers. "Designx: Complex Sociotechnical Systems." *She Ji: The Journal of Design, Economics, and Innovation* 1, no. 2 (2015): 83 - 106)

⁷ Transdisciplinarity is a holistic approach. ‘It is not just about interactions between specialised fields, but about placing these interactions in a total system with a social purpose.’ (Piaget, 1972, p138). Piaget, Jean. "The Epistemology of Interdisciplinary Relationships." In *Interdisciplinarity, Problems of Teaching and Research in Universities*, edited by Leo Apostel, Guy Berger, Asa Briggs and Guy Michaud. Paris: OECD publications, 1972.

and social innovation is essentially a new practice.; it is not the same as design in its traditional contexts. Dorst (2015) argued in an earlier issue of this journal, that when practices ‘jump’ from one discipline to another part of society – as we attempt to do in design for public and social innovation – they are not just *adopted* without substantial change, but should be *adapted* to the needs in the target field. He also argues that an innovation in practices across fields is more likely when such adaptation happens at a deeper level, and the *core* practices of a discipline are concerned. He then goes on to argue that the core practices of design to consider in adapting it to other contexts, are abductive thinking and problem framing, where framing is the key to design abduction. This core practice of design promises a new way of problem solving or addressing complex problem situations⁸ that is fundamentally different from the deductive thinking processes commonly preferred in public and social organisations.

The interest in design from public and social sector organisations to help their organisations to become more innovative, has led to a wealth of available design methods, tools, toolkits, and educational programs to train staff in gaining design and innovation expertise. These training resources currently provide little insight into the practice of framing. It is often presented as a rather mysterious leap attributed to the creative expertise of designers. If design, and in particular framing, are important elements of public and social innovation, then an understanding of these practices would be helpful to support people and organisations who want to adapt and improve their own innovation practices.

In addition to the interest of public and social sector organisations in design for public and social innovation, there also is a growing interest in the topic within academia, demonstrated by various studies. Descriptive studies have focused on conditions for design practice to have positive impact in public and social innovation.⁹ Furthermore, prescriptive studies have been conducted that promote and evaluate specific methods¹⁰, but so far evidence of the impact of these methods beyond individual case studies is limited. If we want to advance the field of public and social innovation for complex contexts we need to complement these studies with a deeper understanding of what is happening within the design practices in this field, beyond describing its conditions. In this paper I therefore take another approach by studying framing as currently applied *inside* social and public innovation practice. Rather than studying the application of a specific design method or methodology, the starting point is the ‘adapted’ practice of experienced social and public innovators who are working at the forefront of the field. The research presented in this paper was part of a broader study into the designerly

8 Acknowledging that in complex situations problems are interconnected and consequently cannot be ‘solved’ as such, the term ‘problem solving’ as used in traditional design practice, seems less appropriate in the adapted practice in public and social innovation. As Rittel and Webber argue ‘Social problems are never solved. At best they are only re-solved – over and over again’. (p160). Rittel, Horst W.J., and Melvin M. Webber. "Dilemmas in a General Theory of Planning." *Policy Sciences* 4, no. 1973 (1973): 155-69.

9 Yee, Joyce, and Hazel White. "The Goldilocks Conundrum: The 'Just Right' Conditions for Design to Achieve Impact in Public and Third Sector Projects." *International Journal of Design* 10, no. 1 (2015): 7-19.

10 For example, within the same paper as mentioned above, Dorst (2015) presents ‘Frame Creation’ as a method to address complex societal problems. This method has also been applied and studied by the author of this paper (e.g. van der Bijl-Brouwer, Mieke, and Dorst, Kees. “Advancing the Strategic Impact of Human-Centred Design.” *Design Studies* 53, no. 2017 (2017): 1-23.

elements of innovation practices of social and public innovation agencies¹¹. In this paper I will specifically zoom in on the core design practice of problem framing.

Framing

Before investigating the practice of problem framing in public and social innovation I will first present a brief overview of research into framing within respectively traditional design research and within the policy context to address complex societal problems.

Framing in traditional design practice

The term ‘frame’ as used in this study, originates in sociology to explain human behaviour in social contexts. The sociological theory of symbolic interactionism states that how one behaves in a given situation is determined by the actor’s *definition of the situation*¹². A frame then refers to a set of principles or rules or an organizational pattern which one can use to identify and make sense of that situation¹³. The act of framing made its way into design theory through the work of Schön (1983) who argued that framing is an essential element of problem setting in reflective practices such as design. “In order to convert a problematic situation to a problem, a practitioner needs to do a certain kind of work. [...] Problem setting is a process in which interactively we name the things to which we will attend and frame the context in which we will attend to them” (1983, p40). In subsequent work Schön (1988) suggested that for designers this means that ‘in order to formulate a design problem to be solved, the designer must *frame* a problematic design situation: set its boundaries, select particular things and relations for attention, and impose on the situation a coherence that guides subsequent moves’. Cross showed that problem formulating is a key element of design cognition because design problems are often ill-defined. “It is often not at all clear ‘what the problem’ is, and designers find and formulate problems within the broad context of the design brief” (Cross, 2007, p78).

Framing in policy studies

The application of framing to address complex societal issues has mainly been studied within the field of policy studies. This discourse mostly builds on the ‘frame analysis’ theory developed by sociologist Goffman¹⁴, and, in line with this theory, is predominantly analytical. For example, Gamson & Lasch (1983) describe the use of framing in political discourse and show how ‘framing and reasoning devices’ are used by public officials and

11 Public and social innovation is currently mostly concentrated within specialized innovation agencies or ‘labs’ who work inside or alongside public and social sector organisations. See for an overview McGann, Michael, Emma Blomkamp, and Jenny M. Lewis. "The Rise of Public Sector Innovation Labs: Experiments in Design Thinking for Policy." *Policy Sciences* 2018 (2018): 1-19.

12 See: Littlejohn, Stephen W. "Frame Analysis and Communication." *Communication Research* 4, no. 4 (1977): 485-92.

13 The term ‘frame’ was originally coined by Gregory Bateson (1972) who defined a (psychological) frame as “a spatial and temporal bounding of a set of interactive messages” (p191), which refers to a type of metacommunication involving the exchange of ‘signals’ which explain a frame in which to interpret certain behavior, for example, the bite like behavior of an animal within the frame of ‘play’ has a different meaning from a bite in ‘not play’. Erving Goffman is famous for expanding this term in his theory of ‘frame analysis’, the examination of the organization of experience (p11). He uses the term to understand the ‘rules’ which govern our appreciation of what goes on around us and enable us to differentiate between different sorts of ‘reality’.

14 Van Hulst and Yanow (2016) provide an overview of the conceptual history out of which frame analysis emerged. van Hulst, Merlijn, and Dvora Yanow. "From Policy “Frames” to “Framing”: Theorizing a More Dynamic, Political Approach." *American Review of Public Administration* 46, no. 1 (2016): 92-112.

their political opponents to display certain events in their speeches and presentations. For example, they analyse four competing frames related to the issue of social welfare, labelled ‘welfare-free-loaders’, ‘working poor’, ‘poverty trap’, and ‘regulating the poor’, each leading to a certain policy position. For example, the ‘poverty trap’ frame rests on income maintenance and universal family allowances combined with economic programs aimed at creating a full employment economy. This example illustrates the prevailing static view on frames in policy analysis in which frames are ‘often treated as objects people possess in their heads and develop for explicitly strategic purposes’ (van Hulst & Yanow, 2016, p93).

Framing as a dynamic practice by policy practitioners

A separate development of the role of framing in policy analysis has the same origin as framing theory in design, namely the work of Schön, in his collaborations with his policy studies colleague Rein¹⁵. They argued that policy development is essentially a process of problem setting and that ‘problem setting is important because the questions we ask shape the answers we get’ (Rein & Schön, 1977, p236). They further contended that the nature of public problems and ‘intractable policy controversies’ limits the ability of the social sciences to contribute to their resolution¹⁶, and argued that policy analyst should instead engage policy practitioners in reflecting on their largely tacit processes of situated frame reflection (Rein & Schön, 1996, p99), the pattern of actions undertaken by those who design and implement policies in the realm of action. While Rein and Schön argued in the same article that the ‘[policy] analysts’ focus of attention should shift from retrospective studies of policy controversies and the ‘preoccupation with the ideal preconditions for frame-reflective policy inquiry to the *practice* of such inquiry’ (ibid, p98), this idea of a more process-oriented approach to framing in policy analysis remains underdeveloped in the policy analysis field¹⁷.

Framing in public and social innovation

The practice of framing in public and social sector is currently evolving through the application of design by public and social sector *innovation* practitioners. As outlined in the introduction of this paper, design has been acknowledged by many as contributing to public sector innovation, which includes its potential for problem framing. For example, according to Bason, one of the three main promises of design in a policy context is the way in which it provides a different approach to the task of understanding public problems (Bason, 2014, p4). Although its theoretical underpinning is underdeveloped, various resources are available that guide practitioners through these problem framing processes¹⁸. An often applied model is the UK Design council’s ‘double-

15 The earliest collective work of Rein & Schön dates from 1977, while their last publication is their often cited work from 1996 about frame-critical policy analysis and frame-reflective practice.

16 According to Rein and Schon the nature of public problems consists of ‘multiple equilibria, theoretical pluralism, and incommensurability’ (1996, p87)

17 In a recent paper Van Hulst and Yanow promote a policy analytic approach that shifts the focus in policy analysis to “framing’ the interactive, intersubjective processes through which frames are constructed.’ (2016, p93).

18 The importance of ‘problem finding’ and ‘setting the frame’ has been highlighted in many professional reports and guides for innovators in the public and social sector, For example IDEO (2015) "The Field Guide to Human-Centered Design." Aimed at social sector innovation, includes a section on the importance of ‘framing your challenge’ Yee, J., H. White and L. Lennon (2015). Valuing design; mapping design impact and value in six public & 3rd sector projects. Articulate the importance of ‘problem-finding’ in the design practice in six public and third sector projects.

diamond' model¹⁹, which defines problem definition as a process of divergence and convergence towards problem definition, before diverging and converging to create the solution (UK Design Council, 2013).

The study of framing practices in design

In contrast to framing in public and social innovation, framing practices in traditional design have been studied more extensively, mostly through protocol analysis²⁰ in various contexts, including individual expert product designers' practices, team design activity²¹, and interaction between designers and their clients in the briefing process²². Most influential has been Dorst & Cross' (2001) study of the practices of expert designers. The study validates a model of 'co-evolution' which shows that framing is about the co-evolution of a problem alongside a solution. "It seems that creative design is not a matter of first fixing the problem, and then searching for a satisfactory solution concept. Creative design seems more to be a matter of developing and refining together both the formulation of a problem and ideas for a solution, with constant iteration of analysis, synthesis and evaluation processes between the two notional design 'spaces'—problem space and solution space" (p434). This model contradicts the UK Design Council's double-diamond model which suggests that problem definition happens *before* solutions are generated.

Research method

The study presented in this paper is aimed at contributing to an understanding of framing practices in public and social innovation. The two main research questions of the study were:

1. How do problem frames evolve within public and social innovation practices for complex societal problems?
2. What drives the generation of problem frames within public and social innovation practices?

To investigate the practices of public and social innovation labs, I adopted a retrospective case study approach. A case study approach was found appropriate, because it allows the study of real-world contemporary events which do not require control over behavioural events (Yin, 2009, p. 8). Studying the practices in a real-world context is essential to understand framing *in the context of* public and social innovation. The unit of analysis of the case studies was a public or social innovation project aimed at addressing a complex societal issue. Studying real-world projects uncovers actual practices, instead of a general account of innovators on how they work²³. The

19 The double diamond model was originally developed in 2007 by the UK Design Council based on desk research and a study of the design departments of eleven global companies. UK Design Council (2007). A study of the design process. London, UK Design Council.

20 See Cross (2006) for an overview of protocol studies into design cognition (p77-93). Cross, Nigel. *Designerly Ways of Knowing*. Basel: Birkhauser, 2007.

21 Valkenburg, R. and K. Dorst (1998). "The reflective practice in design teams." *Design Studies* 7(2-3): 111-121 provided a detailed analysis of framing within team design activity, through the analysis of transcripts of the communication of two student design teams using a coding scheme based on Schön's theory of reflective practice.

22 Paton, B. and K. Dorst (2011). "Briefing and reframing: a situated practice." *Design Studies* 32(6): 573-587 showed how experienced visual communications designers have professionalised the crucial art of frame communication and frame adoption with their clients, based on a detailed analysis of the conversations about design briefs between designers and their clients.

23 Argyris and Schön refer to this as 'theory-in-use', the theory of action which is implicit in the performance of that pattern of activity. This differs from the 'espoused theory', the theory of action which is advanced to explain or justify a given

projects were studied retrospectively because this allowed studying multiple long-term projects at different international locations.

To select case studies, I approached five public and social sector innovation agencies from my international network that had at least two years of experience working within or alongside public and/or social sector organisations to innovate on complex societal problem situations. Together with the contact person of the agency an appropriate project was selected based on the following criteria: the project aimed to address a complex ill-defined problem situation, it included a collaboration with a public and/or social sector organisation²⁴, and it was recent enough for team members to be able to reflect on the practice. The five selected case studies are presented in table 1.

Table 1: overview of the five case studies

Agency	Initial brief	Key partnering organisation(s)	Outcome
MindLab	Address the dilemma of time versus quality for Danish elementary school teachers, following a reform of educational policy and a change in working conditions of teachers in terms of increased taught lessons and hours of presence at school. This resulted in less time for preparation and feedback and was having a negative impact on staff satisfaction. ²⁵	Municipality, Denmark	Several initiatives of which one was successfully implemented
KennisLand (KL)	Support the municipality and the relevant stakeholders and partnering organisations in answering the questions ‘How could we design better policy?’ and ‘What is it like to be living well as a young person in [the municipality]?’	Municipality, the Netherlands	Seven different prototypes of which some are being developed further
InWithForward (IWF)	Address the question of how to reduce social isolation amongst adults living with cognitive disabilities.	Three non-profits and providers of services for adults living with disabilities, Canada	Several initiatives, two of which were implemented
The Australian Centre for Social Innovation (TACSI)	Increase the restoration of children from foster care to their birth families, by answering the question how do we enable more children to safely return home to their families, stay home, and thrive?’	Philanthropic organization, academic institute, and state government	Three prototypes which are currently being tested and a strategy for systems change

pattern of activity. (p13). Argyris, Chris, and Donald A. Schon. *Organizational Learning Ii, Theory, Method, and Practice*. Addison-Wesley Series on Organizational Development. Edited by Edgar H. Schein and Richard Beckhard. Reading, Massachusetts: Addison-Wesley Publishing Company, 1996.

²⁴ The main difference between public and social sector is the funding mechanism and organizational structure. Because both sectors aim to have positive impact on society, innovation in both sectors is often referred to as ‘social innovation’. So far there is no research that reveals differences in design and innovation practices between the two sectors and study results are therefore often combined. See for example Yee, Joyce, and Hazel White. "The Goldilocks Conundrum: The ‘Just Right’ Conditions for Design to Achieve Impact in Public and Third Sector Projects." *International Journal of Design* 10, no. 1 (2016). I therefore chose to not distinguish between public and social innovation in this study and I did not find significant differences in framing practices between agencies that worked with either public versus social sector organisations.

²⁵ See for a description of the MindLab case study: Nygaard, Lene, and Sophie Reynolds. "Creation Solutions for Danish Teachers: The Time and Quality Dilemma." <https://www.nesta.org.uk/blog/creating-solutions-danish-teachers-time-and-quality-dilemma-0>.

		department, Australia	
CoLab	Support state government in answering the question: how can we affect changes to the system of data and information publication, and leverage or modify governance processes to ensure we make significantly more, and the most valuable data open and available?	State government, Canada	Input for the development of a strategy

Data gathering included semi-structured interviews with at least two team members of the innovation agency or department and at least one staff member of the partnering public or social sector organisation(s). Staff members from individual organisations were interviewed individually or in their teams of 2 or 3 people. Individual interviews took 30-60 minutes, while group interviews took 60-90 minutes. In total 16 interviews were conducted, with 14 staff members of innovation agencies and 8 staff members of their partnering organisations. Seven interviews were conducted in person and the other interviews were conducted over the phone or video call. Two innovation agency staff members participated in a second interview to validate results. The agencies also gave us access to documentation about the project such as reports and other design materials. We triangulated the data from multiple interviews and documents for each project to promote a comprehensive and robust approach for this qualitative study.

The interviews were transcribed in full. An inductive thematic approach was taken to analyse the practices. In collaboration with a research assistant the data was coded and together we identified themes in relation to the research questions in an iterative way. The triangulated data from the different interviews and project documents for each case study were used to summarise the projects in a case study report which showed the different steps in the design process, used methods, and the way in which the problem framing and proposed solutions²⁶ evolved. I created an additional visualisation of the process that showed a more fine-grained evolution of the problem framing and proposed solutions, as well as the relationships between problem frame and solution, and the design rationale that drove this evolution (see Figure 1 for an example).

²⁶ I use the term ‘solution’ here in line with the dominant literature in design research about framing. Some of the agencies felt uncomfortable with this term as complex problems cannot be solved, and preferred to use terms such as ‘initiatives’ or ‘prototypes’.

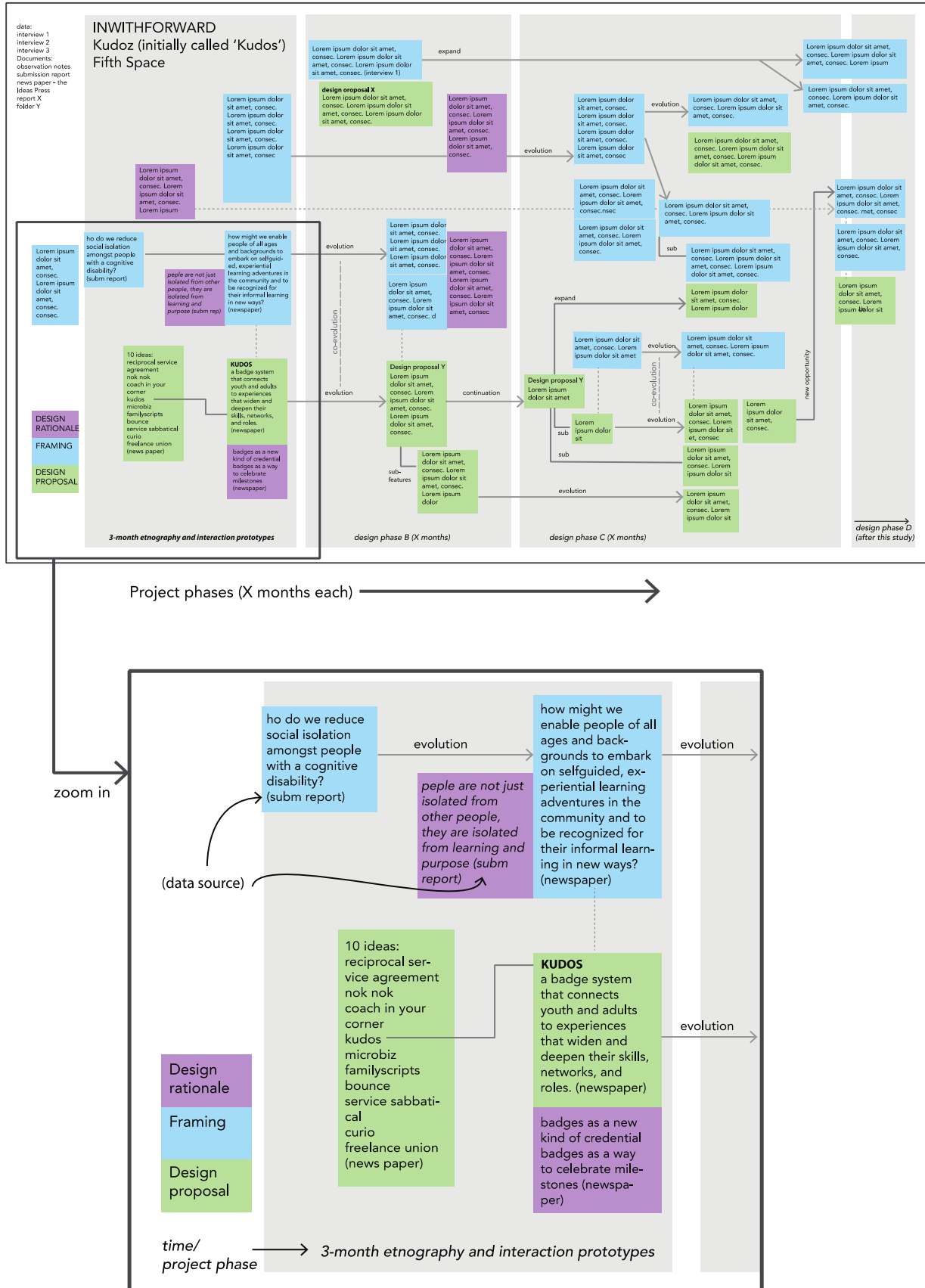


Figure 1: partly anonymised example of a visualisation of the evolution of the problem framing within the IWF Kudoz case study (initially called 'Kudos'), over a 2-year time frame. The blue boxes describe the problem frame statements, while the green boxes describe the associated solution proposals. The purple boxes describe the key design rationale.

This research approach enabled an analysis of how framing evolved over the course of the different project phases in the specific innovation context. Limitations are that the analysis is not as fine-grained as in a protocol analysis, and interviewees relied on their memories to provide an account of the practices. The data does therefore not present a complete overview of all the ideas about problem and solution as they might have emerged over the course of the projects. However, the data is rich enough to uncover a number of interesting themes that will be presented in the following sections. Please note that the case studies are limited to Western contexts that are characterised by relatively horizontal power structures. The results as presented in this paper might not apply to agencies that are based in non-Western or more hierarchical or failure-intolerant societies.

Results: framing in public and social innovation

The framing processes within each of the five case studies showed how the problem framing evolved – its ‘frame evolution pattern’-, and showed the drivers of that problem framing and associated solution space. The evolution pattern and its drivers impact the linearity of the process, which is further explained below.

Framing evolution pattern

Evolution

All case studies showed an evolution of one or more of the problem frames. This means that the teams changed the way they were thinking about the original problem. For example, InWithForward started with a problem frame of ‘how do we reduce social isolation amongst people with a cognitive disability’, to a focus on ‘how do we reduce isolation from learning and purpose’, to more specific focal points for specific segments such as ‘how can we help people with identifying interest for employment opportunities’. This evolution continued over the course of the project, from the initial discovery stage until the implementation stage. A more fine-grained pattern of evolution of the problem framing showed how the teams diverged and converged in the generation of problem frames, and how these problem frames evolved in relation to the proposed solutions.

Divergence/ convergence

All five case studies showed divergence from an original problem statement to two or more ways of framing the problem. In three of the case studies, the frames were different ‘sub-frames’ that all contribute to the original overarching frame, without essentially changing its goal. For example, about 4 months into their project about child protection TACSI presented different frames to achieve the overarching frame of ‘how might we enable an ‘ideal’ state of child protection that protects the most vulnerable members of our community and breaks the cycle of disadvantage’. These ‘sub-frames’ included ‘how might foster care build and maintain parental capability and keep families together’, ‘how might we identify, optimise and spread exceptional case worker practice to facilitate appropriate restorations’ and two other sub-frames. In the other case studies, the diverged frames also subtly changed the original overarching goal. For example, in the CoLab case study the initial framing was focused on ‘making more and the most valuable data and information open and available’, while the diverged framing included both a subtle change in the initial framing namely ‘designing for information exchange that the public wants, avoids harm and promoted public good’, plus an additional framing focused on ‘culture change towards open government’. Four of the five case studies showed convergence in framing, but rather than selecting and converging to one of the problem frames, all case studies showed how multiple problem frames

and their associated solutions were selected to develop further. One case study did not show convergence in problem framing explicitly, but did show divergence and convergence in the solution space.

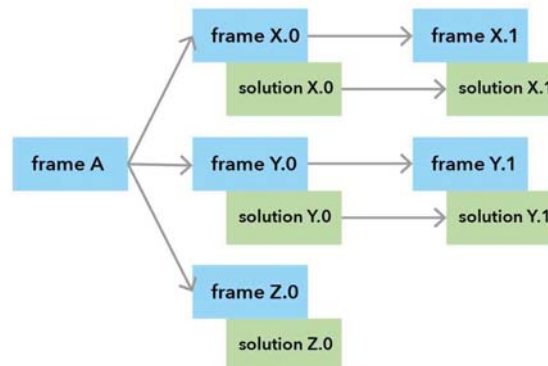


Figure 2: four of the five case studies showed a pattern of evolution of the problem frame that included divergence and convergence in framing, co-evolution of problem frame with the proposed solution, and selecting and developing multiple problem frames and associated solutions.

Co-evolution

Four case studies also showed a level of co-evolution of problem framing and designed solutions. In these cases, the views on the problem changed based on reflections and/or evaluations of the evolved solution or the other way around. For example, the above-mentioned evolution of the InWithForward problem framing co-evolved with the design of the Kudoz platform. The initial idea of Kudoz was based on the evolution from a focus on social isolation amongst people with a cognitive disability, to a focus on improving the quality of the relationships by injecting novelty into people's lives. Kudoz is a platform that connects adults with cognitive disabilities to experiences offered by community hosts, the idea being that richer experiences will improve the quality of interactions with other people and the resulting quality of relationships. Elaborate prototyping and testing of the prototype then led to the realisation that Kudoz could also be used as a tool or platform that service providers and employment workers could use as part of their own practices to find out which employment opportunities are in line with the person's interests. In one case study co-evolution of problem and solution was not identified. This could be caused by the fact that this team was not involved in prototyping and testing of solutions and/or because the data set was not complete. Figure 2 illustrates the combined pattern of frame evolution, divergence and convergence, and co-evolution of problem frame and solution.

Drivers of framing

Four ways in which the evolution of the problem framing was driven in the case studies were identified: framing driven by respectively research, solution testing, principles, and thinking tools.

Research driven

Three of the five case studies used research approaches to analyse and frame the problem. The research methods had an explorative and qualitative nature and investigated the problem from the perspective of multiple stakeholders. Methods included deep and rapid ethnography, collecting 'stories', consulting experts and literature reviews, in-depth interviews, card sorting and journey mapping, and institutional immersion with service providers. One agency, InWithForward, also explicitly mentioned how they use social theories to inform the way

they frame a problem. For example, they described how Carol Ryff's theory of 'positive human functioning'²⁷ contributed to their framing of the problem being about 'being isolated from learning and purpose'.

Solution driven

Solution-driven problem framing is in line with the co-evolution of problem and solution mentioned above and could be identified in four of the five case studies. By evaluating and/ or reflecting on proposed solutions, the teams learned about the problem and adjusted the problem framing accordingly. These iterations ranged from testing low-fidelity prototypes (referred to by interviewees as 'mini-prototypes' or 'provocative prototypes') in co-design sessions early on in the process, to more developed prototypes that were tested in a real-world context. The prototype tests provide both insights into the suitability of the prototype to the framed problem, as well as the suitability of the problem frame itself. The abovementioned example of the framing of Kudoz showed how elaborate testing of the platform led to a reframe late in the design process. The MindLab team used 'provocative prototypes' early on as a strategy to understand the problem of how they might help teachers share experiences to help them improve their lessons (the 'time-quality dilemma'):

".. we took this prototyping approach where we had to find out what characterises this problem. Why are we not in the future desired state already? In the future state where people just [...] share and use each other's experiences, build on each other's experiences, both in the individual schools and across schools.[...], we provoke the teachers via these prototypes, the [lesson] box inspired by the [mealkit box with vegetables]. So we learn about what does it take, why don't people share experiences?"

They learned from this provocative prototype test that teachers don't want to adopt complete lessons from other teachers (for example through the proposed lesson box), but rather adopt and modify certain elements of each other's experiences. This insight then led to the design of a 'speed sharing event' at a later design stage.

Thinking tools and reflection

The above-mentioned drivers for framing include interactions with stakeholders. The case studies also showed approaches that helped the teams think about and reflect on the problem, without necessarily involving other stakeholders. One team mentioned how they used metaphors, comparing the problem at hand to other contexts to develop their understanding of the problem. Three teams mentioned how they used systems maps (for example rich picture, concepts map, ice berg model) to reflect on the systemic elements of the problem space.

[member innovation team CoLab]: "A big part of our work is reflective practice where [...] you are really immersed in it and your head is exploding but then you pause and you look back on everything that you did to then trace the steps and the logic and make sense of it. And so we pushed the group on day 3 to, [...] reframe the problem and it was in that conversation, that reframing bit where the group clicked from Open Data that this is a much bigger problem space than what the client initially thought."

27 Ryff, Carol D., and Burton H. Singer. "Know Thyself and Become What You Are: A Eudaimonic Approach to Psychological Well-Being." *Journal of Happiness Studies* 9, no. 1 (2008): 13-39.

[staff member partner organisation MindLab]: “We are used to acting too quickly and make solutions too quickly so we have somebody to help us to get the courage to be where we are just now and think, reflect more about it”

Principle driven framing

A final strategy that was identified in the case studies was framing problems based on guiding principles. Guiding principles are the beliefs, values and attitudes that designers bring to each design problem they approach. (Lawson, 2006, p159). Principles included ‘opening up the brief’ and ‘systemic thinking’. For example, all case studies started with a briefing process, in which the agencies and their partnering or funding organisations negotiated the initial brief. In this process, all agencies ‘opened up’ the brief to allow for a broader framing and/or a more positive view on the problem.

[Team member TACSI]: “So we started off with a brief. [...] And then from there, we really started, I guess, pounding the pavement and seeking to really test, unpack all of the assumptions that were sitting behind the framing questions. And I think what we learnt very, very, very quickly was some fundamental things that opened up the brief to a whole new level.”

[Team member Kennisland]: “It is also about ‘de-problematizing’ of what first is seen as a problem.”

Three of the five studies framed the problem explicitly on two different levels: a strategic systems level focused on the broader system in which the problem sits, and a service level that was aimed at addressing specific problems for the target group. For example, TACSI developed service prototypes to address child protection in the short term, as well as a ‘prospectus’ of the big picture systems changes that were required to generate larger scale changes. They referred to this process as ‘two-track thinking’:

[Team member TACSI]: “So I guess we've got these two tracks now. We've got these prototypes that our [target users] can go, "Oh look, we're doing these things" that are tangible and alongside that, we've got this prospectus that we've created that we're just working with another set of funders around now, to look at well how do we actually start to conceptualise what a different system or different parts of the system could look like.”

Combining drivers of problem framing

The agencies combined these different strategies, but differed strongly in their approaches within the respective case studies in terms of how the project and resulting framing was driven. While three had a strong research approach, the other two started with thinking tools and assumptions, in addition to a solution-driven approach.

(Non-) linearity of the design process and capability building

Combining the evolution patterns of the problem framing (divergence/convergence, evolution and co-evolution of problem and solution) with the different drivers for that framing (research, solution testing, thinking tools, and principles) reveal innovation practices that are distinct and *non-linear*. Rather than a linear problem-solving approach, where the problem is researched, and then framed before solutions are developed and tested (as suggested in the UK Design Council’s double diamond model), the case studies show patterns that are not

planned in advance, but that are explorative and emergent in nature. This becomes clear even without having insights into the fine-grained reflections within interactive team meetings or co-design sessions. This is partly caused by the co-evolution of problem and solution. The interdependence of problem and solution prevent a linear problem-solving approach. However, non-linearity does not just emerge from co-evolution, teams also applied non-planned approaches to research that impacted framing. For example, in the Kudoz case study one of the drivers of the framing process was using various social theories in a non-linear way:

[team member InWithForward]: “So one thing that we did during the ethnographic research part is that we used quite a few different articles but without like specifically choosing for one or another. There was a stage where we just took what we thought resonated or was inspiring and then we tried it out in a design research tool and then we were trying like does this make sense. Is it something that helps our understanding of the population group or not?”

In other words, they did not first read social theories and then decide on their framing, but added these research insights iteratively. Some interviewees confirmed the non-linearity of the design process by explaining how framing cannot be planned in advance:

[team member CoLab]: “..to me a reframing is something that you're looking for in design, but you're not planning for it. [...] You don't know when that moment's going to come, but you're definitely open to looking for it, and so sometimes it comes from the iceberg diagram of, like, really drilling down into the mental model. Sometimes it comes from the ethnographic interviews.”

However, two case studies show a slightly different picture compared to the other case studies in relation to the non-linearity of the design process. One case-study showed a process that was less salient in its non-linearity compared to the other case studies. Even though the framing evolved over time, ideas were generated *after* the team agreed on a particular way of framing the problem and the framing was not adjusted after the generation of these ideas (no clear co-evolution). In the second case-study the team *represented* its process in a linear way in both their planning and reporting of the project, even though our analysis showed non-linear elements/ co-evolution outside of that presented pathway. Interestingly enough, these two case studies were the ones that had an additional objective to the original objective of addressing a complex problem situation, namely the objective of building innovation capability within their partnering organisation. These results will be further discussed in the following sections.

Discussion

Framing expertise in public and social innovation

Although not an original focus of this study, capability building was a theme that was discussed by multiple interviewees. In two case studies the innovation agencies explicitly integrated capability building into their process, aimed at teaching staff of partnering organisations innovation skills, and in a third case study one of the designed initiatives was a capability building program. This is in line with a trend in public and social innovation to integrate and embed innovation capability within organisations by focussing on teaching innovation skills

rather than making organisations dependent on external innovation consultancies²⁸. For example, in a recent OECD paper, Daglio et al. argued that professional public servants need to acquire skills and motivation for innovation²⁹. And Ryan, Schulman and argue that ‘social research & development’ – the processes applied on the frontline to generate new insights and innovations that transform services, products, and organisations - must be integrated with, not isolated from the groups and institutions that manage the current system (p11). Furthermore, many public and social sector organisations are starting to invest in capability building of staff and there is a growing number of capability building programs offered by design and innovation agencies³⁰. Still, there is limited empirical research on how to enable the public and social sector to innovate³¹. In the context of the study presented in this paper it then becomes relevant to ask firstly what those capabilities are in relation to framing, and secondly how these capabilities can be acquired.

To address the question of innovation capability to address complex societal problems I use the notion of *expertise*. Lawson and Dorst (2009) argue that design expertise is not acquired in some continuous and seamless manner but that there appear to be more or less distinct layers of expertise, which each enable quite different modes of thinking and action. The layers are based on a generic model of expertise developed by Dreyfus & Dreyfus, a five-stage phenomenological model of the acquisition of expertise³². This model describes a novice, advanced beginner, competence, proficiency, and expertise level. The novice level, where the learner begins is rule-based, where the learner is given rules for determining actions on the bases of the features of the ‘context-free’ task environment. With ‘talent and a great deal of involved experience, the beginner develops into an expert who intuitively sees what to do without recourse to the rules.’ (Dreyfus & Dreyfus, 2005, p788). Novice designers use largely rule-based and convention-based thinking. They consider the objective features of a situation, as provided by the experts, and follow strict rules to deal with the problem. Rule-based thinking allows us to tackle complicated problems with approaches that are often a combination of logic and the experience of many designers before us (Lawson & Dorst, 2009, p68). This is very different from the ‘expert’ level, where the expert responds to a situation intuitively, applying design judgement and intention that allows outcomes to emerge³³.

²⁸ Organisational design capacity can be increased by hiring design experts or by training existing staff. The latter approach seems to become more popular caused by the limited availability of design experts with an interest in social innovation, combined with the increasing desire of public and social sector organisations to integrate and embed innovation practices.

³⁰ Examples of innovation capability building programs include Nesta’s recent international ‘States of Change’ program, which is aimed at building “the capability and culture of governments to practically deal with the complex problems they face” Nesta. "States of Change - About Us." <https://states-of-change.org/about..> Design agencies increasingly offer capability building as well, referred to by Burns, Cottam, Vanstone, and Winhall as ‘transformation design’, which “seeks to leave behind not only the shape of new solutions, but the tools, skills and organisational capability for ongoing change” (p.21). Burns, Colin, Hilary Cottam, Chris Vanstone, and Jennie Winhall. "Transformation Design." London, UK: Design Council, 2006.

³¹ A study by Seelos and Mair (2012) shows that organisational capacity for continuous innovation in the social sector is highly underresearched. Seelos, Christian, and Johanna Mair. "Rockefeller Foundation Report: What Determines the Capacity for Continuous Innovation in Social Sector Organizations?": Stanford Center on Philanthropy and Civil Society, 2012.

³² Dreyfus, Hubert L., and Stuart E. Dreyfus. "Five Steps from Novice to Expert." In *Mind over Machine - the Power of Human Intuition and Expertise in the Era of the Computer*, 16-51. New York: The Free Press, 1986.

³³ Nelson and Stolterman (2012) explain how expert designers heavily rely on ‘design judgment’, the ability to gain subconscious insights that have been abstracted from experiences and reflections, ,informed by situations that are complex,

If we look at the framing evolution patterns identified in our study and the way this was iteratively driven by research, solution generation, thinking tools, and principles it becomes impossible to describe ‘rules’ that would allow novices to follow such non-linear patterns. This non-linearity and explorative nature of the design process is widely acknowledged, particularly for the ‘fuzzy front end’ of the design process where ‘there is no clear path on how to proceed and there may be many divergent paths to explore before any patterns can be discerned’ (Sanders and Stappers, 2012, p22). We observe emergent pathways, that are driven by a path-dependency, where each new direction of the path is contingent on the learning accumulated so far in the design process. Instead of rules, a certain type of expertise is required to navigate this path. Lawson & Dorst refer this expertise as ‘managing’ and more specifically Schön’s notion of ‘reflection on action’³⁴: “Reflection on action can be seen as a higher-level activity in which the process is monitored rather than the state of the design. [...]. It involves a mental ‘standing back’ and asking if the process is going well or might be steered differently” (Lawson & Dorst, p58).

A second type of expertise that can be identified in the study is related to the guiding principles that were adopted by the innovation teams, including for example ‘opening up the brief’ and ‘systemic thinking’. I will refer to these principles as ‘systemic design principles’³⁵, as they are in line with systems thinking theory³⁶. The use of guiding principles builds on expertise that is related to what is in traditional design often called the ‘repertoire’³⁷ of a designer, the level of experience that practitioners have with the problem in hand (Lawson 2004, p445). This suggests that the experience of the innovation agencies with similarly complex problem situations in preceding projects might have contributed to development of the systemic design principles.

Framing in public and social innovation – a new practice

Concluding, the framing expertise identified in this study includes driving and navigating a non-linear and emergent framing process, and the use of guiding principles that are specifically targeted at complex societal problems. Although this practice is similar to Dorst’s notion of the core practice of framing in traditional design, we can also identify an adaptation of this practice. The practice is adapted to public and social innovation for complex societal problems by the way the framing is driven by systemic design principles, the way it pursues multiple solutions and problem frames, and the various research & thinking methods which align with the complex societal nature of problems, e.g. social theories and systems thinking tools. Understanding this adapted transdisciplinary practice is important to support novice practitioners in learning to become an expert

indeterminate, indefinable, and paradoxical, resulting in the emergence of meaning and value (p145). Nelson, Harold G., and E. Stolterman. *The Design Way - Intentional Change in an Unpredictable World*. Second Edition ed. Cambridge, Massachusetts: The MIT Press, 2012.

³⁵ We identified more than ten different systemic design principles that are each in line with different characteristics of systems thinking. A presentation of those principles is outside the scope of this paper and will be published in a forthcoming article.

³⁶ Opening up the brief is in line with a key element of systems thinking that Ackoff refers to as ‘expansionism’. This is opposed to a reductionist approach of dividing a problem statement into smaller problems. Ackoff, Russell L. *Ackoff’s Best*. New York: John Wiley & Sons, 1999.

³⁷ Schön describes a practitioner’s repertoire to include the whole of his experience insofar as it is accessible to him for understanding and action (p138). Schön, Donald. *The Reflective Practitioner: How Professionals Think in Action*. New York, NY: Basic Books, Inc, 1983.

practitioner, as well as for expert practitioners to keep improving their practice, and to contribute to drive this evolving field. It might be particularly relevant to the many 'traditional' designers who are interested in moving to the field of public and social innovation, and who will need to adapt their own practice to this new context.

At the same time, it is likely that there are other practices that contribute to the framing process that were not revealed in our study. For example, research in traditional design process has shown that framing in a collaborative context is heavily influenced by the social interactions within that process, both within the design team as well as between design team and client in the briefing process³⁸. Anecdotal data within our study suggests that such social practices within public and social innovation exist as well. More studies with different research methods could further enhance our understanding of this framing practice on a more detailed level of granularity, for example by conducting protocol studies of such social interactions within the real-world context of public and social innovation.

Capability building in public and social innovation

In this context it is also relevant to discuss capability building in public and social innovation in relation to framing. The presented case studies have started to provide us with insights into the framing practices of experts. How can we help novices to start moving towards this expert practice? The initial adoption of design practices in the public and social sector has been based on the provision of learning experiences that were very similar, if not equal, to the adoption of the new 'design thinking' in business. These learning experiences include many linear methods and tools, and workshops and training programs. Dreyfus & Dreyfus claimed that novices require such rule-based and 'context-free' learning experiences (Dreyfus & Dreyfus, 1986, p21). However, contemporary educational theory on experiential learning suggests that, learning experiences should be authentic, meaning they should be as close to the actual practice as possible. This is in line with the approaches to capability building that we identified in this study, where staff from partnering public and social sector organisations were actively involved and sometimes driving parts of the projects.

A challenge of problem-based learning on real-world complex problems is that the practitioners need to integrate a linear rule-based approach to support the novice practitioners, with a non-linear expert approach required to address the complex problem situation at hand. Should complex societal problems therefore be addressed by experts only to prevent their process being 'diluted' by linear-thinking novices, or is it acceptable to integrate capability building³⁹ in this process? An important view on this issue is that capability building itself *is* an effective way to address complex societal problems by enabling systems change. Instead of viewing practitioners as outsiders of a system who design initiatives to move that system into a certain direction, an alternative

38 Valkenburg and Dorst studied the influence of team communication on framing in Valkenburg, Rianne, and Kees Dorst. "The Reflective Practice in Design Teams." *Design Studies* 7, no. 2-3 (1998): 111-21.; Paton and Dorst studied the practice of frame communication in the briefing process between designers and their clients Paton, Bec, and Kees Dorst. "Briefing and Reframing: A Situated Practice." *Design Studies* 32, no. 6 (2011): 573-87; Bucciarelli provides a further explanation of social interactions in design, by arguing how participants in a design collective can work on the same object of design, but see it and talk about it in different ways Bucciarelli, Louis L. "Between Thought and Object in Engineering Design." *Design Studies* 23, no. 3 (2002): 219-31.

39 Mulgan argued that the use of the word 'capacity building' in public innovation is problematic, because the word 'building' implies that capacities are like walls or building that can be built, brick by brick, instead of being like muscles that are built up through exercise, repetition and coaching. Mulgan, Geoff. "Capacity Building, Gyms, and 'Just Doing It'." <https://www.nesta.org.uk/blog/capacity-building-gyms-and-just-doing-it/>.

perspective is to see those practitioners as being part of the system⁴⁰ and therefore as part of a solution to continuously help the system to adapt to complex and dynamic contexts. In this view it is not just *acceptable* that novices are actively supported in learning innovation practices, it becomes an *essential* part of this practice⁴¹.

Another argument to support integrated problem-based capability building approaches is that in this transdisciplinary field it is becoming increasingly blurry who is the expert and who is the novice. In this paper I have highlighted one particular element of the innovation practices for complex societal problems, but a holistic view of the practice would reveal many other types of expertise distributed over multiple people. Dreyfus and Dreyfus (1986) explain that individuals will be at the same time expert with respect to certain types of problems in their area of skill, but less skilled with respect to others (p20). A ‘master-apprentice’ model in that context is then limited to particular elements of the master’s expertise and needs to at least be complemented by collective learning models where innovation practitioners are learning from each other, as for example in communities of practice⁴². Such social approaches to learning are based on work in sociology and social anthropology in response to individual and cognition-based learning theories such as Schön’s reflective practice. More recent, postmodern theories of workplace learning view learning as ‘emergent’, an ongoing process of learning that is emergent from its context in unanticipated ways⁴³. Future research will therefore be aimed at further investigating these social and emergent aspects of learning in the context of public and social innovation.

Conclusion

In this paper I showed and discussed the results of a study of the framing practices as observed within five cases of public and social innovation for complex societal problems. The study revealed the evolutionary, non-linear and emergent pattern and drivers of problem framing practices. These results suggest that innovating for complex societal problem situations requires a sophisticated and complex skill set and expertise that reflects the complex nature of the problems they aim to address. Supporting people and the organisations they are part of in developing this expertise is key to creating the systems change required to address complex societal problems.

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40 In ‘Design as Participation’, Kevin Slavin (2016) argues that designers of complex adaptive systems are not strictly designing systems themselves. ‘Rather, they understand themselves to be participants, shaping the systems that interact with other forces, ideas, events and other designers’.

41 Ryan and Schulman refer to this as ‘social R&D’, the art and science of applying research and experimental processes on the frontline to generate new insights and social innovations. Ryan, Alex, Sarah Schulman, and Vinod Rajasekaran. "Out of the Lab and into the Frontline." *Stanford Social Innovation Review*, no. Winter 2018 (2018): 11-12.

42 The term ‘community of practice’ was coined by Lave and Wenger to refer to social learning processes, but the term has been criticized for being vague. See for example Hager, Paul. "Theories of Workplace Learning." In *The Sage Handbook of Workplace Learning*, edited by Margaret Malloch, Len Cairns, Karen Evans and Bridget N. O’Conner, 17-31. London: SAGE Publications Ltd, 2011.

43 Hager, Paul. "Theories of Workplace Learning." In *The Sage Handbook of Workplace Learning*, edited by Margaret Malloch, Len Cairns, Karen Evans and Bridget N. O’Conner, 17-31. London: SAGE Publications Ltd, 2011.

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