

The Challenges of Human-Centred Design in a Public Sector Innovation Context

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Abstract: The world is increasingly faced with complex societal problems such as climate change, an ageing population, radicalising youth and chronic health problems. Public sector organisations have a key role in addressing these issues. It is widely acknowledged that tackling these problems requires new approaches and methods. Design, and in particular human-centred design, offers opportunities to develop these methods. In this paper I argue that a new type of human-centred innovation practice is necessary to adjust traditional user-centred design methods and tools to the public sector innovation context. This context involves different types of stakeholders with conflicting needs and aspirations, and requires a precise articulation of the value of human-centred design. I will propose a possible answer to these challenges through a case study relating to severe mental illness, in which we applied Dorst's frame creation methodology, in combination with the NADI-model of Needs and Aspirations for Design and Innovation.

Keywords: public sector, human-centred design, design innovation, methods and tools

Introduction

The world is increasingly confronted with complex societal challenges including climate change, poverty, crime, health issues and an ageing population. Public sector organisations play a key role in developing solutions for these issues. However, many argue 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)

Over the past decade, design has emerged as a possible answer to dealing with these challenges. Dorst (2015) advocates that the new open, complex, dynamic and networked problems of our time require a radically different response, and that design can contribute



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to this as expert designers deal with the new types of problems in their professional field without too much trouble. The application of design outside the traditional design domain is often called 'design thinking'. In their publication on design for public good the UK design council states that 'design thinking is the way to overcome common structural flaws in service provision and policymaking' (UK Design Council, 2013). Likewise Bason (2010) argues that design approaches and tools can help government to consciously create meaning and value we want citizens, businesses and other actors in society to experience.

When design is applied within a public sector context, it sits within the field of 'public sector innovation'. Bason (2010) defines public sector innovation as the process of creating new ideas and turning them into value for society. It is therefore not just about generating creative ideas, but also about the implementation of them and the continuous delivery of value. Innovation in the public sector considers the design and implementation of products, services, processes, positions, strategies, governance and rhetoric (Hartley, 2005). The desired result of these innovations is the creation of 'public value', including service quality, societal outcomes (reduced crime, educational attainment), and societal values such as democracy, equality, and trust, legitimacy, and confidence in the government (Bason, 2010; Kelly, Mulgan, & Muers, 2002; Vigoda-Gadot, Shoham, Schwabsky, & Ruvio, 2008).

The application of design in public sector innovation is resulting in a new emerging practice in which design approaches are used to design and implement public services, products, policies and procedures across domains such as housing, employment, health, crime prevention, and education (van der Bijl-Brouwer, Kaldor, Watson, & Hillen, 2015). Although some promising results have been achieved, this practice has also been critiqued in different ways (Dorst, 2015; Mulgan, 2014). The application of design thinking in the public sector has often led to public servants not taking on the full potential of design as an innovation approach. At the same time, designers have often ignored the particular characteristics of the public sector context in their social designs, which has often failed to lead to long-lasting social innovations.

There are various elements of design that contribute to public sector innovation. For example, the UK Design Council (2013) showed that design contributes to public sector innovation through integrating analysis, solution and implementation, looking at the entire system, understanding user needs, testing iteratively, and engaging teams and departments in collaboration across silos. In this paper I will focus specifically on the application of user-centred design methods and tools to public sector innovation. In the next section I will firstly describe two challenges of applying human-centred design in a public sector innovation context. Next I will give an example of an approach that addresses these challenges, which I will illustrate through a case study. I will conclude this paper with discussing an agenda for the study of human-centred innovation practices in a public sector context.

The challenges of human centred design in a public sector innovation context

Human-centred design (HCD) is a group of methods and principles that are aimed at designing useful, usable, pleasurable and meaningful products or services for people. The main principle of these methods is that they describe how to use insights about human beings – users, customers, or other stakeholders - to design products or services that meet their needs and aspirations. HCD has developed from a methodology focussed on ergonomics and anthropometric data (Dreyfuss, 1955), to a more contextualised design-focussed methodology that integrates needs and aspirations across the physical, cognitive and emotional domain, and that involves users and other stakeholders in the design process in different ways (for example Jordan, 1999; Norman, 1998; Sanders & Stappers, 2008).

HCD has matured to such an extent that it is now increasingly being adopted in sectors outside the traditional design domain to support innovation. Publications by Martin (2009) and Brown (2005) kick-started the 'design thinking' movement, which advocates the application of design methods to develop business strategies to gain competitive advantage. Furthermore, following the early work of Papanek (1984), design is gaining popularity in the public and social sector to address complex societal problems (Bason, 2010; Dorst, 2015; Manzini, 2015).

However, applying HCD methods and principles in a public sector innovation context is not just a matter of taking the principles and methods and applying them directly to public sector problems. As the public sector context is fundamentally different from the traditional human-centred design context, it requires a new trans disciplinary practice (van der Bijl-Brouwer, Kaldor, Watson, and Hillen, 2015). The two challenges from a HCD perspective that I will discuss in this paper are firstly the complexity of identifying the human beings that are at the centre of HCD in a public sector context, and secondly the need to articulate the value of HCD methods and tools.

2.1 Challenge 1: Who are at the Centre of Human-Centred Design in the Public Sector?

Traditionally design theory and methods have been centred on the end-user of products, so called user-centred design (e.g. Norman, 1998). The adoption of design thinking in businesses in the private sector has broadened the focus from the user to the customer or consumer. Likewise, in the public sector the term citizen-centred public service design has recently emerged (Mager, Grimes, Atvur, McMullin, & Malhotra, 2013). However, to make sure that design proposals are implemented and embedded within the public sector organisational context, we need to look further than just the people who receive or use a solution. The networked character of many complex societal problems, means that many stakeholders are involved who are either influenced by the problem and/or potentially play a role in solving the problem (Dorst, 2015). The needs and aspirations of all the stakeholders that are part of the problem and solution need to be addressed to be able to develop

solutions that are adopted and implemented by those stakeholders. For example, it is important to address the needs of service providers to motivate them to deliver high quality services (van der Bijl-Brouwer & Watson, 2015).

A second challenge with regard to the 'target group' of HCD in a public sector innovation context, is that the target group is not something that can be deliberately chosen. The public sector is held accountable for providing public value for all citizens, and it is not publicly accepted that people 'fall through the cracks'. This is a fundamental difference to innovation in the private sector, where target groups can strategically be chosen to find opportunities for innovation that align with the organisation's strategy (for example Bucolo, Wrigley, & Matthews, 2012).

2.2 Challenge 2: Articulating the Value of HCD Methods and Tools

The transfer of design practices to fields outside the traditional design field has resulted in an increasing number of 'non-designers' taking on design approaches themselves or engaging with design professionals, to develop innovative solutions. This includes public managers who seek to drive change in their public sector organisations through design-based approaches. A widely recognised element of public sector innovation is the need to develop and implement solutions across agencies and organisations (van der Bijl-Brouwer, Kaldor, Watson & Hillen, 2015, Sørensen & Torfing, 2012). It is therefore essential to engage teams and departments in collaboration across 'silos', as indicated by the UK Design Council (2013).

In a cross-silo co-design situation involving non-expert designers it becomes particularly relevant to articulate how design-based practices contribute to innovation. This 'consciousness' of the value of design-based practices is required to embed innovation in a public sector organisation (Bason, 2010). At the moment this need is met by the availability of a plethora of online toolkits, method cards and books, as well as tutorials, master classes, and courses in various methods. The risk of providing people with random collections of methods is that it can be quite overwhelming. More importantly, the possible experienced superficiality of individual methods might distract from the real value of human-centred innovation approaches. We therefore need succinct and clear means to articulate what can and cannot be achieved using HCD in a public sector innovation context.

A human-centred innovation approach

To address abovementioned challenges of human-centred design in a public sector context, we have experimented with various methods and tools in our research centre. The underlying methodology we use to address networked problems is Frame Creation, developed by Dorst (2015). Furthermore the need to better articulate the value of human-centred design methods and tools have led to the development of a model of Needs and Aspirations for Design and Innovation (NADI-model) (van der Bijl-Brouwer & Dorst, 2014). I will introduce this methodology and model in this section.

3.1 Dorst's Frame Creation Methodology

Dorst (2015) developed the Frame Creation methodology based on a combination of empirical studies into expert designer's practice, a fundamental analysis into reasoning patterns and different forms of rationality, and experimental practice. The approach is particularly suitable to address problems with an open, complex, dynamic and networked character. The main principle of the approach is that addressing these problems requires a 'reframe' of the problem, a new perspective on the problem. The following three elements of the methodology are of particular interest when we look at the challenges of human-centred design in a public sector context:

Context and field: these steps are aimed at identifying and examining stakeholders. Dorst distinguishes stakeholders in the context and in the field (ibid, p76). The context contains the inner circle key stakeholders who have been involved in the problem situation before, or those who are clearly going to be necessary participants in any possible solution. The field considers the wider space of players, including anyone who might be connected to the problem or the solution at some point in time. As such, Frame Creation clearly goes beyond the usual suspects in mapping stakeholders and through that addresses the challenge of human-centred design in a public sector context to address the networked character of problems.

Themes: themes analysis is aimed at identifying and seeking to understand the deeper factors that underlie the needs, motivation, and experiences of the stakeholders in context and field. A theme is a phenomenological construct and may be understood as the structure of experiences. Themes are often universal human values and meanings. Identifying themes is beneficial in networked problems as they present a deeper level of the problem at which stakeholders have much in common. After identifying themes, frame creation uses methods borrowed from hermeneutic phenomenology (van Manen, 1990) to understand the themes. Understanding the pattern of a theme subsequently supports exploring new frames in the next step.

Frames: to move from themes to frames and solutions, it is useful to look at how elements of the pattern of the theme are dealt with outside the original problem context. Through using metaphors a frame can then be created which forms a bridge between the problem and the solution (Dorst & Tomkin, 2011). Different frames are then analysed on their 'fruitfulness' i.e. the extent to which they open up the solution space. In section 4 I will illustrate this with a case study.

3.2 The NADI-model

The focus on themes in the frame creation methodology means that it is inherently a human-centred methodology. But not every HCD method provides insights into themes. To explain how themes are related to insights that are gathered through other methods, we developed a four-layer model of insights into human Needs and Aspirations for Design and Innovation (NADI-model). The model is based on an analysis (see van der Bijl-Brouwer & Dorst, 2014) of the kinds of 'deep' insights that experts in design and innovation recommend

to gather (e.g. Hekkert & van Dijk, 2011; Martin, 2009). We found that we can distinguish four levels of insights: needs and aspirations that are related to solutions, scenarios, goals, and themes (figure 1).

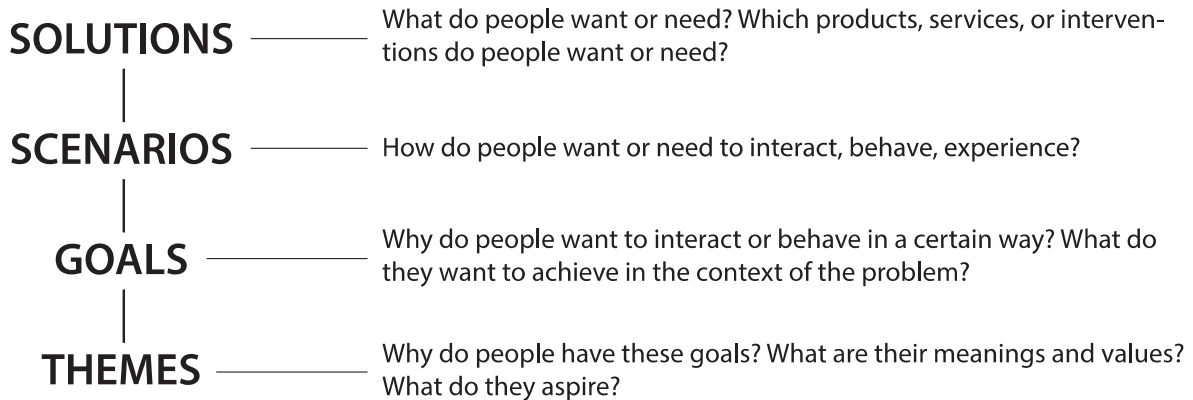


Figure 1 The NADI-model: a model of insights into Needs and Aspirations for Design and Innovation

On the solution level we find the insights that are related to *what* people want, such as products and services. One level deeper, the scenario level describes *how* they want to interact with a solution. The deepest levels of insights are the goals and themes levels, which describe why people want certain solutions and scenarios. The difference between goals and themes is that goals describe what people want to achieve within the context of a certain design problem, while the themes describe the underlying needs and aspirations that can be analysed independently of that context. For example, the design of a sports car might be based on the themes ‘identity’ and ‘independence’; both of which are also relevant in situations outside of a sports car. The goals, in the context of a car, could be that someone likes to have a car all to him or herself and that the car should fit that identity of independence. The scenarios that achieve these goals are ‘getting attention while driving on a boulevard on your own’. The solution could be a two-seater (just for yourself) or a convertible car (being visible).

We developed the model because we have experienced that the different levels of insights each have a different purpose in the design and innovation process. As I explained in the section on the Dorst’s frame creation methodology, the advantage of an analysis of themes is that it stimulates (re-) framing of problems and through that opens up the solution space. On the other hand, gathering insights on the scenario level is mostly valuable for incremental innovation that does not require a reframe of the problem, or for refining solutions after the frame has been set. Furthermore scenarios are beneficial for communicating solutions as they provide a common language across stakeholders (van der Bijl-Brouwer & van der Voort, 2013).

The NADI-model addresses the need to articulate the value of human-centred design in a public sector innovation context. The model can be used to make explicit which methods lead to which kinds of insights. Furthermore the model can be used to present new solution proposals alongside their underlying needs and aspirations. We have experienced that this

supports the decision-making process in multi-stakeholder problems, as all the stakeholders involved in decision-making can develop a shared understanding of the needs and aspirations that a solution intends to address through the NADI-model.

A case study: supporting people with severe mental illness

4.1 Background

We were asked by Hunter Partners in Recovery (PIR) to help them solve the systemic problems of supporting people with severe and persistent mental health problems who acutely need help (see also van der Bijl-Brouwer & Watson, 2015). These people are referred to by PIR as ‘consumers’. PIR aims to generate and implement interventions for this problem through particularly looking at the systemic aspects of this problem. The systemic aspects concern the problems that arise from the fact that many service providers are currently involved when people with a severe mental health problem acutely need help when they are very unwell, for example when they are psychotic, severely anxious, and/ or suicidal. In these situations the consumer, their carers (family or friends), community members or their landlord might make the first call. Ambulance might transport someone to the hospital or a mental health unit, the police might be involved when someone is threatening self-harm or harming others, the emergency department and mental health professionals provide help in the hospital, and various service providers can be involved in follow-up care including general practitioners, social workers, non-government organisations etc. This journey is often very traumatising for consumers. Furthermore there are often conflicts between ambulance, police and emergency department about the priority of emergency responses. PIR wanted to engage all these stakeholders in the process of generating interventions, but had no capacity for a process to (co-) create solutions. They therefore invited us to support them in that process.

4.2 Case Study Approach

In the project we used Dorst’s frame creation methodology and the NADI-model as described in the previous section. Within the context, field, themes and frame steps of Frame Creation we applied various (human-centred) design methods to gain the required insights. We for example used stakeholder mapping, storytelling, cultural probes, and co-design workshops to gain insights into the needs of the large variety of stakeholders in the context and field. We then applied both internal (within our research team) and external (with varying groups of stakeholders) sessions in which we explored themes and frames. The NADI-model was used to communicate frames and solutions to stakeholders. The project was executed over the course of six months.

4.3 Results of the Case Study

Figure 2 shows a stakeholder map of this problem with the person with a severe mental illness and their caregivers in the middle, and around them the many persons and

organisation that are either affected by the problem, or play a role in the development of solutions. What becomes immediately evident is that there are many people and organisations involved, and that this is therefore a very complex networked problem.

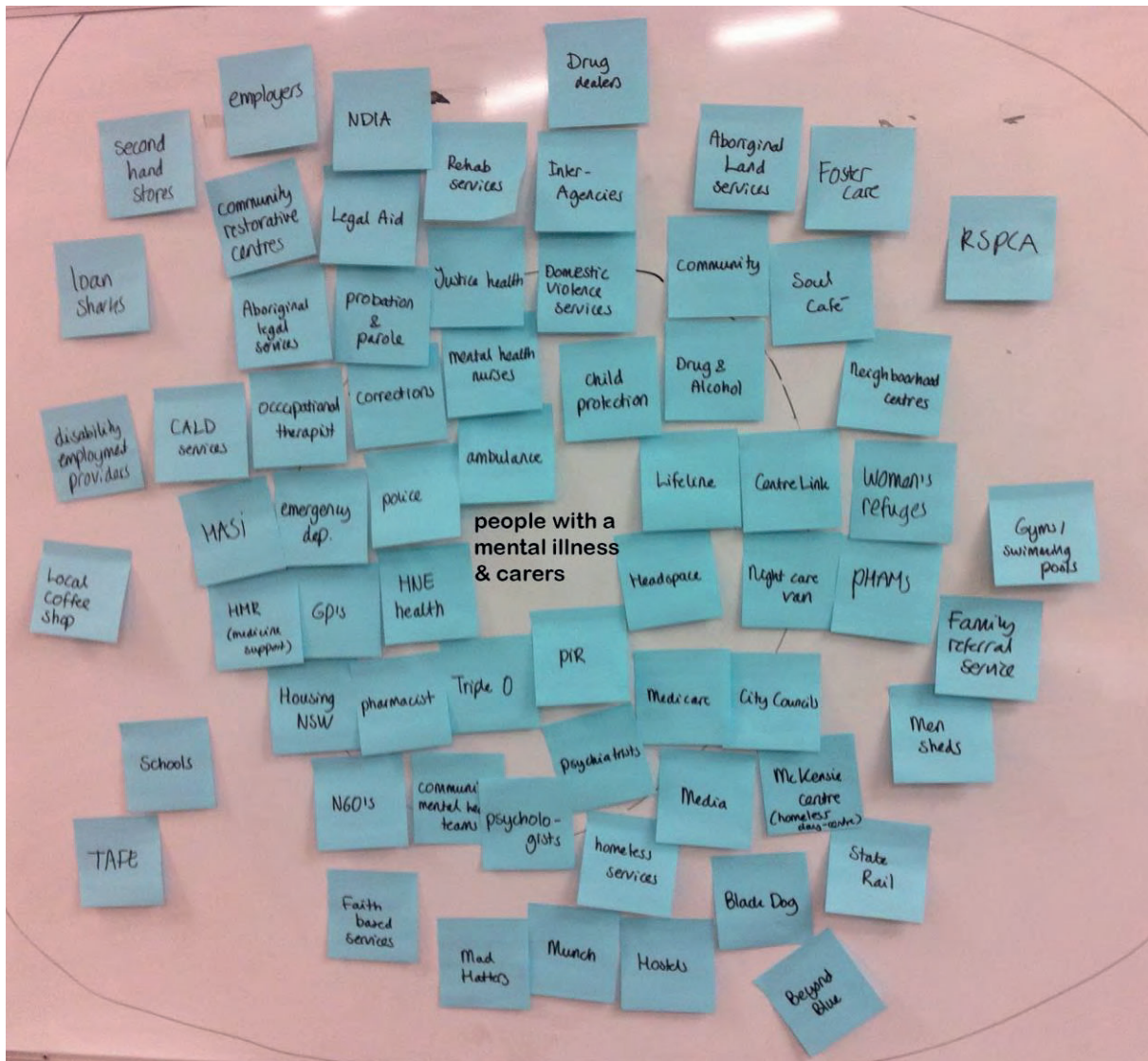


Figure 2 Stakeholder map for the systemic problems of supporting people with severe mental illness

When we explored the needs and aspirations of these stakeholders we found a number of reoccurring themes, including 'contribution', 'drive', 'empathy', 'empowerment', 'piece of mind' and 'consistency and stability'. In this paper I will use the reoccurring theme 'drive' to illustrate how an analysis of themes can lead to the development of solutions. All interviewees and workshop participants who work in the sector mentioned their drive to make a difference. For example, an ambulance paramedic mentioned that *'there's no better feeling than saving someone's life'*.

In Frame Creation we subsequently use methods borrowed from hermeneutic phenomenology to develop an understanding of theme outside the context of the problem.

This includes various exercises, including reflecting on the theme through personal experiences, literature about the theme, and exploring pieces of art or music that reflect the meaning of the theme (see for examples Dorst, Kaldor, Klippan, & Watson, 2016). Through these exercises we try to find the 'pattern' of a theme. For example, we asked ourselves the question 'when do you experience drive?' and 'what does it feel like?' Through this analysis we found that to sustain the drive to make a difference, there is a need for feedback. This pattern is shown in figure 3. When you are driven to do something good, you feel a sense of achievement when you can see what the results of your efforts are. For example, when cooking for friends it feels good when these friends show that they are enjoying the meal. This feeling might in turn motivate you to continue organising dinner parties for your friends. Without the feedback, the drive cannot be sustained. This analysis of the theme outside the context of the problem of severe mental illness, allowed us to find this feedback pattern.

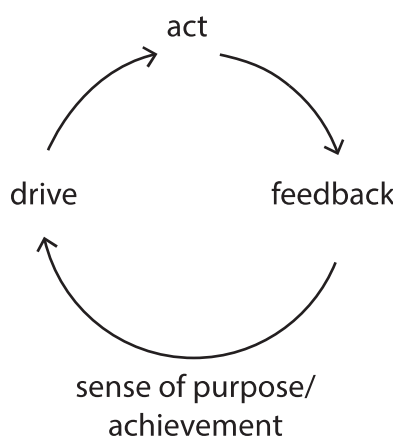


Figure 3 A pattern found through an exploration of the theme 'drive'

The need for feedback to sustain the drive is exactly what was missing in the problem context of an acute mental illness response. Police officers for example indicated a sense of futility and frustration: 'If we do not hear from the person again, there is an assumption that one of three things happened to them: 1) they got better, 2) they moved away, 3) they died. We are essentially feeding our efforts into a 'cone of silence' that does not speak back.' Likewise, ambulance paramedics mentioned similar experiences as there is no quick fix to mental health problems: *'It's not like stopping the bleeding or starting the heart'*.

Feedback is also an essential element of another theme: learning or 'growth'. Apart from learning through training, people learn 'by doing' and reflecting on what they do (reflective practice). But you only learn if you know what the effects of your actions are (figure 4). In the cooking example you can only become better at cooking when you can taste the food or when your friends tell you (honestly) what they think of the meal you prepared for them. Feedback on actions is therefore essential. A police officer confirmed this and indicated it would be useful to know what works and what wouldn't. A part of the systemic problem of

supporting people with severe and persistent health problems is therefore this broken cycle of drive and growth.

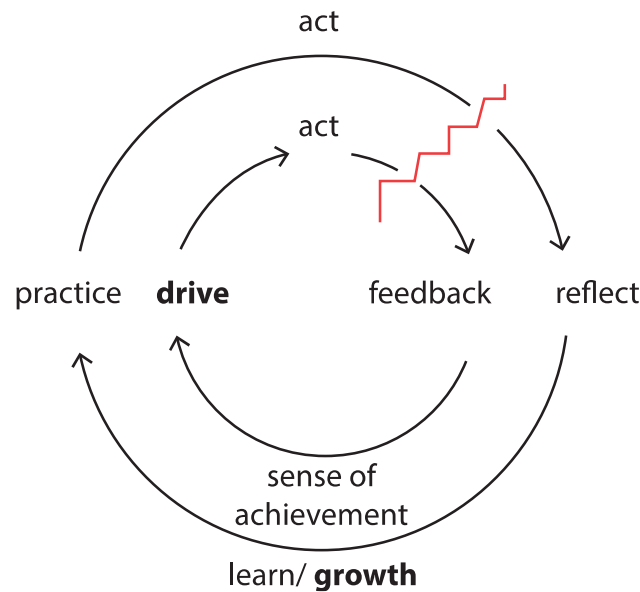


Figure 4 The broken cycle of the themes drive and growth

To frame the problem we looked at how the elements of the themes are dealt with in domains outside the problem context. Exploring these metaphors can lead to new frames (Dorst 2015). A frame that turned out to be particularly fruitful for the themes of 'drive' and 'growth' was looking at generating a shared response to mental illness as if it were a sports team. We found that the current shared response is like a sports team in which each player is on the field at a different moment, and each player has a different coach. This makes it very hard to collectively coach the people on the ground, and sustain their drive and growth. Through this frame we developed the solution of a 'coaching team'. The coaching team is explained through the NADI-model in figure 5. A coaching team [solution] is a group of team leaders of each of the participating organisations (ambulance, police etc.). The envisioned scenario of this coaching team is that they frequently come together to reflect on what is happening on the 'field'. To be able to get an appropriate view on this field we designed a new role: the 'observer'. This is someone who interviews people with a severe mental illness who have recently been through an episode, and maps their experience through for example a journey map. This journey map is then fed into the coaching team, which allows them to reflect on their collective actions. They can then develop an adjusted coaching approach, providing both constructive feedback on the negative stories, as well as positive feedback on the good stories. The goal of this scenario is to stimulate motivation and provide reflective practice for learning for the service providers in acute mental illness situations. The underlying themes are drive and growth.

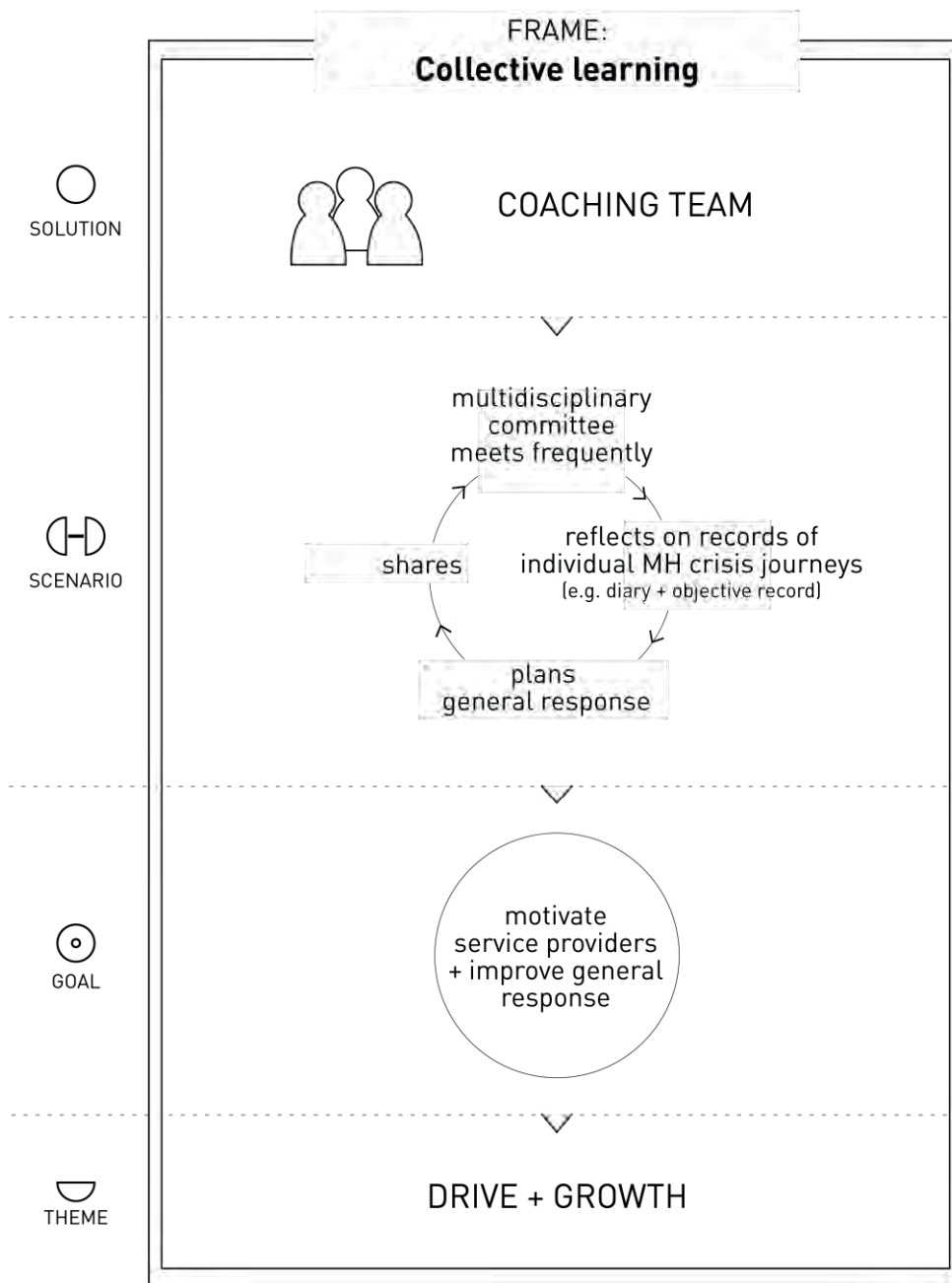


Figure 5 NADI-model for the 'coaching team'.

Discussion

5.1 Who's at the Centre of HCD in a Public Sector Context?

One of the complexities of HCD in a public sector innovation context is the large amount of stakeholders involved. This was also the case in the acute mental illness case study. Through applying the frame creation methodology we explored the deeper levels of needs and aspirations to find a common ground for solutions. The common need for drive and growth led to the development of the 'coaching team'.

This raises the question which types of stakeholders we can distinguish in complex societal problems and whether we can identify a typology of reoccurring themes. For example, the themes 'drive' and 'growth' will likely reoccur in other problems involving many service providers. Without claiming to be complete I would like to discuss the following categories of stakeholders:

Problem owners: the stakeholders – often public sector organisations - who are accountable for tackling a problem or take responsibility in addressing a problem, often public sector organisations. This might not always be straightforward. In the mental health case study, PIR was an organisation that was specifically put in place by the federal government to address this problem. Before their establishment there was not a clear problem owner for the systemic problems around acute mental illness. Themes that are likely to apply to problem owners are for example reputation, identity, leadership, contribution, and responsibility.

End users: the stakeholders that make use of a designed solution or intervention, for example children in a school using new educational tools, or people with a disability using in home help services. Themes for this group are very diverse and relate to the specific problem that is being addressed.

Direct contributors: the stakeholders who contribute to a solution by offering time and effort, for example through providing a service, e.g. school teachers contributing to the learning of children or volunteers providing help at refugee centres. Themes that often apply to direct contributors include motivation/ drive, care, identity, belonging etc.

Indirect contributors: stakeholders that contribute through providing resources, including funding and infrastructure, for example a local council providing a community centre, or a government agency providing funding to an NGO to provide a service. Different themes apply to why people and organisations provide resources, such as identity, control, and accountability.

The public: people who are indirectly affected by the implementation of an intervention, for example members of the community who are informed of the implementation of a new service for homeless people through the media. The public needs to be considered as they indirectly hold public sector organisations accountable through voting and paying taxes. Themes include societal values such as equality, empowerment, compassion, community etc.

The boundaries between above-mentioned stakeholder groups are blurry and increasingly overlapping. For example, in the mental health case, people with a severe mental illness were end-users, but also contributors. They contribute through sharing their stories for the coaching team to be able to function. It was precisely that opportunity for contribution to society that motivated them to share the stories.

These blurred boundaries between contributors and end-users are widely recognised in the public sector innovation literature (Bason, 2010; Kelly et al., 2002). This new relationship between public state and citizens is called co-production – working together to produce public outcomes (Christiansen & Bunt, 2014). Public sector organisations have been aware of the opportunities of co-production for some time, but there are plenty of remaining barriers to creating the conditions for its implementation (Boyle & Harris, 2009). HCD might be able to contribute to this field, by clarifying the underlying patterns of human behaviour when people contribute to, provide resources, or use interventions for complex societal issues.

5.2 Articulating the Value of HCD

In the PIR case study we used the NADI-model to explain how solutions intended to address underlying needs for scenarios, goals and themes. Clarifying the relationship between problem and solution seemed to establish a common ground for decision-making. This need for a shared frame of reference in decision-making is generally acknowledged in the design research field (Visser, 2006; van der Bijl-Brouwer & van der Voort, 2014).

Furthermore, the NADI-model helped in articulating which HCD methods lead to which levels of insights. For example, the interviews with caregivers resulted in many stories of experiences, which articulate their needs and aspirations on the scenario level. Further research is required to map other HCD methods to the model.

The frame creation method also helped in articulating the value of HCD methods and tools. It provides a ‘backbone’ to the human-centred innovation process, by indicating how the insights gained through a specific method, e.g. stakeholder interviews, feed into the framing process, and through that the innovation process. This provides a better insight into the function of individual methods than a collection of seemingly unrelated methods and tools.

5.3 An Agenda for Researching HCD in a Public Sector Innovation Context

To help mature the new emerging practice of HCD in a public sector innovation context, I propose to address the following topics in future research:

- Exploring the different types of stakeholders in complex societal problems and their reoccurring needs and aspirations, such as suggested in section 5.1
- How and when to include stakeholders in the public sector innovation process (e.g. through co-design). Who should facilitate this process? Who should take ownership? How can people be motivated to participate in co-design? What is the role of public sector organisations in this process?

- How to evaluate solutions in the public sector innovation process through prototyping and piloting. Prototyping and qualitative formative evaluations are required in an iterative HCD process, while the public sector context also requires evidence - quantitative summative evaluations - to support the decision-making of policy makers (Mulgan, 2014).
- How to relate HCD principles and concepts to theories on public value. Public value includes the quality of products and services (outputs), the outcomes of this process (e.g. lower unemployment rates), and societal values such as equality and democracy (Bason, 2010; Kelly et al., 2002). Outcomes and societal values are not part of traditional HCD practices.

Conclusion

In this paper I presented two challenges of applying HCD to a public sector innovation context, and showed how Dorst's frame creation methodology, in combination with the NADI-model addresses these challenges. However, human-centred public sector innovation should not just be seen as a challenge, but also as an opportunity. The complexity of societal issues can be better understood through the complex networks of stakeholders. HCD provides opportunities to better design and coordinate for these complex networks of stakeholders, by exploring why and how people use, adopt, and contribute to all kinds of solutions that are intended to make the world a better place.

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