

Structuring roles in Research through Design collaboration

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In Research through Design knowledge is generated, but not always captured and shared effectively. When working in a multidisciplinary team of, e.g. designers, design researchers, academic researchers and domain practitioners confusion about roles, processes, and results easily occurs. In a series of three Research through Design cases we developed a set of role descriptions to help structuring the collaboration in such projects, using different configurations of people, roles and documentation tools. We conclude with a structure for assigning roles that enables multidisciplinary teams to make their Research through Design process more explicit, reflect on their activities as part of process data, and propose moments to capture knowledge from all actors involved.

Research through design, collaboration, design documentation

1. Introduction

Research through Design (abbreviated in this paper as RtD) covers a range of approaches in which design and research activities inform each other with the aims of generating new insight and new solutions. Most academic discussions of RtD concern work of academic researchers (in PhD positions or beyond, often with a design background). When an RtD project involves multiple actors in a multi-faceted project, collaboration can become rather challenging. Different actors are often strongly motivated and dedicated in willing to improve the current situation, come from very different backgrounds, and bring in a wide variety in expertise knowledge, skills and language.

In the last two decades design is increasingly addressing complex and social issues (Norman, 2010; Kimbell, 2011; Dorst, 2011; Sanders and Stappers, 2014; Sustar and Mattelmäki, 2017). The design discipline has broadened from traditional product design to the domain of social transformations (e.g. transforming healthcare; Jones and van Patter, 2008). In social design and service design the domain is often complex, and projects typically involve multi-disciplinary teams. The complexity of design problems expands and designer's practice is changing, requiring new methods, practices and roles and new networks to collaborate with (Kimbell, 2011). Stakeholders in design processes are no longer designers' direct clients, but rather a network of different stakeholders. Rygh (2013) suggests new roles for designers such as connectors between diverse stakeholders, facilitators of co-creation



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and instigators to get an idea forward towards implementation. Manzini (2015) suggests several structures to organise social innovation with designers and non-designers, e.g., citizens, where non-designers become the change catalysts, and where designers take a more research-oriented attitude and facilitating role. When many actors from practice are involved designers are faced with challenges to orchestrate, facilitate and moderate all their inputs and activities. Raijmakers, Vervloed and Wierda (2015) describe such orchestration activities, e.g. building involvement and steering larger processes, and suggest that these activities continue beyond the classical design process that ends when a solution is produced. In this paper, we focus on RtD projects involving multiple actors with varying expertise in research, in design, and in the domain where the project is conducted. We address the question of how to organise the collaborative RtD process. We describe an RtD project, MyFutures, in which various parties and expertise were involved (see table 1). The project required collaboration of all involved parties, and aimed at both new knowledge generation and pragmatic guidelines for improving the current situation. Participating actors brought different capabilities and skills regarding design research, domain knowledge, and different amounts of time available for the project. The challenge was to integrate all expertise and structure the collaborative case studies in this project. At the start of the project details of collaboration could not be planned, as topics, needs, and opportunities emerged and developed as the project unfolded. In the next section we review literature on RtD methodology and position our project within it.

Table 1 Key data about the MyFutures project.

Aim	To support people in arranging their own older future lives on our changing society
Phenomenon	Thinking about and anticipating on your own personal future lives when getting older, while the societal context is changing from state-driven care to self-organised care
Research questions	1. How do people (not) deal with their own futures in their everyday lives? 2. How can notions of people’s own futures be stretched towards seeing plural options and more awareness of own needs and wishes?
Method	Literature studies and design research (in-home interviews) to answer the first research question. Case studies in practice with design interventions to gain insights for both research questions.
Involved parties	6 design researchers from university and design school, all with design and design research expertise (through background or design research practice) 3 design researchers from agencies specialised in design research and designing for care-related societal challenges 10 practitioners from institutes like public services (municipalities), health insurances and care-related institutions
Starting point for collaboration	A 2-year research project funded by national science organisation of the Netherlands. Parties contributed in-kind through participation and some of them received partial funding.

2. Research through Design categories

In RtD research and design activities are closely related, but different. Both are intentional activities with the goal of creating something new (Stappers and Giaccardi, 2017), but where research aims to create new knowledge with general applicability, design aims to create new solutions suitable for a particular situation. The differences and overlaps of research and design are widely discussed in literature (Sanders, 2005; Cross, 2007; Stappers, 2007; Koskinen, Zimmerman, Binder, Redström and Wensveen, 2011). Both Koskinen et al (2011) and Stappers & Giaccardi (2017) reflect on a variety of example RtD projects, and the role of process and outcomes. Still, most authors remark that there is no clearly defined, singular, method by which RtD is conducted (Mattelmäki and Matthews 2009; Wensveen and Matthews 2015). Most authors agree on the definition of research as a ‘systematic inquiry, the goal of which is knowledge’ as stated by Archer (1981). However, a review of a wide range of reported RtD projects shows that the ‘systematic’ aspect is interpreted quite differently.

Koskinen et al (2011) categorized RtD approaches in three types: 'lab', 'field' and 'showroom'. In the 'lab' hypotheses are studied, through prototypes in controlled settings. The 'field' approach is conducted in the 'real' world, and involves stakeholders beyond researchers and designers. In the 'showroom' approach instantiations of new prototypes are produced to demonstrate a particular phenomenon or new technology. Stappers and Giaccardi (2017) suggest another categorisation of RtD projects based on outcome orientation:

1. generating collection of examples without an explicit theory or application goal
2. iterative successive prototypes of increasing quality with often an application goal
3. testing hypotheses of concepts under controlled scientific methods
4. pursuing a programme with an inquiry driven approach, in which prototypes are part of experiments meant to explore and open up new design spaces.

Both overviews of categories show how different RtD types can be distinguished, but do not provide guidelines how the systematic inquiry can be organised. Moreover their reviews of RtD projects mostly cover solo research projects, with limited multi-party collaboration. The RtD project we discuss in this paper follows an inquiry driven approach, the fourth type of Stappers and Giaccardi, and the 'field' type of Koskinen et al (2011). In line with Binder and Redström (2006) we structured the project as 'a programme' consisting of a series of questions and experiments. The 'programme' is the organisation of the entire project; the combination of gaining knowledge from literature, field work and design explorations, and a vision on how each of these activities help to answer the main research question. Through 'experiments', in the form of concrete activities, such as co-creation workshops, prototypes and field testing, contributions to theory are developed, consolidated and disseminated.

To conclude we use the term RtD to indicate a study in which knowledge is generated on a phenomenon (inquiry driven) by conducting design activities, drawing in support knowledge from different disciplines, and reflecting on both design activities and evaluations of the design interventions in practice. Our main aim is a general understanding of the phenomenon that drives application beyond the created prototypes in the project. The new knowledge has a theory component and an impact component to improve current practice.

3. Research through Design challenges

Organising an RtD project with multi-party collaboration can be challenging on a number of fronts. We discuss three which are relevant to the collaboration; interplay of research and design, documentation and collaboration.

Interplay of Research and Design

The very terms research and design can already be problematic within a single discipline, but can be downright confusing for practitioners with different backgrounds. The approach to research in this project is through a process of discovery, bringing in as much relevant different perspectives as possible to study the phenomenon in an integrated setting of current practices in everyday life (Stappers, Sleeswijk Visser and Keller, 2014). Many participants without an academic design research training, have more formal expectations of how research is done. Likewise, their perception of 'design' can be traditional, e.g., the formgiving of an object. But the 'material' to create new solutions for societal problems involve people, mindsets, behaviour and organisational change. Design interventions cover more and more the orchestration of how people interact, for example through scripts, tools and staging (Laurel, 2003) which might be less concrete than a traditional design result and not even recognized as a design result. People in a team can have different ideas about design, let alone the interplay of research and design. In our RtD project we aimed to explicitly define what we regard as research and design outcomes, with the intention to create a shared reference with all parties involved. In a process of various iterations of research and design activities,

loops of reflection in action take place, and the generation of prototypes serves to simultaneously explore the problem space as well as the solution space (Koskinen et al, 2011). Basballe and Halskov (2012) have tried to describe their RtD process at a micro level by addressing the dynamic interplay of research and design as they unfold throughout the process. Through the example of the design of a project installation and its use they reviewed how this interplay happened, which gives an insightful view into their RtD process and helps understanding their interplay of research and design activities. Nevertheless, their activities are rather generally divided in research or design, not emphasizing the variety in design or in research activities.

We needed a structure to frame our method and explain the interplay of research and design in understandable ways to support fruitful involvement of all actors.

Documentation

Stappers and Giaccardi (2017) suggest that 'the' knowledge that emerges from RtD is not obvious, so communicating what it is what is looked for, how to capture that and frame the result is a challenge. Documentation and communication of insights and findings should support understanding of all involved actors. Moreover recognizing which data is relevant, selecting it during all the activities in a collaborative iterative process is more complicated than when these activities are planned and conducted in controlled lab settings. For example, a practitioner explaining in his own words what a prototype does can be seen as relevant data by trained researchers, but practitioners might not realise this and may not be triggered to record that explanation. Another example of relevant data that goes missing is design decisions made during the design process for creating prototypes. These are often not well documented but capture rich insights about the phenomenon (Stappers, 2007; Höök and Löwgren, 2012).

Reflective Journals are a method used in action research to document each actor's thoughts. For example Sleeswijk Visser (2009) used this method in cases studies of an RtD project in which she took on different roles to record and analyse thoughts and decisions during the process from the perspective of researcher, designer and user researcher. The journal was used as process data to unravel what had happened during the course of the case study, recordings which otherwise afterwards would have been remembered as 'obvious practice' rather than being recognized as new and relevant insights. Van Asseldonk, Scheepers and Raijmakers (2016) used a trail of evidence technique to capture design students' processes and make intermediate actions and decisions explicit, leading to joint reflections. Also Dalsgaard and Halskov (2012) developed a digital tool, 'the Process Reflection Tool', to document reflections of various involved actors to each event and sub-event.

Altogether, in setting up RtD case studies, we need such type of documentation tools, to capture the otherwise hidden insights next to participatory meetings.

Collaboration

In the areas of social sciences and design research, collaborative ways of conducting research have been reported before, as in action research (Avison, Lau, Myers and Nielsen, 1999), participatory design (Schuler and Namioka, 1993), and co-design (Sanders and Stappers, 2008). However, the way how people collaborate in RtD projects is often less explicitly described, since project settings and aims differ greatly. In participatory settings, Sleeswijk Visser, Stappers, van der Lugt and Sanders (2005) promote to involve everyday people ('end-users') in design processes as 'experts of their experiences' and in that role they contribute to the design process. Again, we take this stance, where not only everyday people are regarded as experts of their everyday experiences, but all involved professionals. This approach helped planning and organising elements of the process, such as co-creation workshops of the programme, but did not provide detail on involving practitioners as producers of shared knowledge generators instead of merely domain information providers. In our project, cases emerged from opportunities in practice, but how the design researchers, designers

and practitioners would go from there was a rather intuitive path where expertise and tasks needed to be optimally combined.

We needed insights on how to orchestrate the collaborative process and define roles in this.

To conclude there are various approaches to conducting RtD, but little guidance on how such projects should be conducted, especially if they are built around a multidisciplinary team rather than individual researcher. How can we benefit from all stakeholders on the right moments in the process and seize knowledge together? In what roles can stakeholders contribute, collaborate and generate insights relevant and useable for each party? After the method section, we describe in section five how we dealt with these questions in running our case studies. In section six, we reflect on the observations and interventions of interplay of research and design, documentation and roles.

4. Method

We reviewed the collaboration of three case studies in this project. The author joined collaborative meetings, observed the process of collaboration, the exchange of information (when enough explicit to point at) and the assignment of roles, tasks and expertise that was divided between actors. The author conducted interviews at the end of each case study with each actor on their individual experiences of the interplay of roles and expertise along the process and on how they experienced the RtD approach from their point of view. Two sessions, one halfway and one at the end of each case study, were organised to collaboratively reflect in- and on the actions and output to evaluate the working structure of the team collaborations. Relevant insights were directly implemented to improve the collaboration processes, as is common in Action Research (Avison et al 1999). A documentation tool, the Reporter Kit (see figure 2), served as a backbone for these reflective sessions since it provided insight in each distinct role actors took. The combination of observations, interviews, reporter kit data and collaborative reflections halfway and after each case study helped to triangulate findings (Denzin, 2006).

5. Collaboration in the case studies

Table 2 shows an overview of the case studies under examination. The cases started when there was a match of research focus, design exploration and opportunity in practice to intervene. For each case a main research question and an applied research question were formulated.

Table 2 Summary of three case studies in the MyFutures project.

Case	Domain	Research questions	Applied research question	Design interventions	Domain practitioners
1	Care request conversations between care planner and care taker	What do people (not) consider when arranging in-home care? Can we stretch their thinking from next day to next year?	How can people be supported in discussing more holistic matters next to practical planning of in-home care and take this into account in care planning?	Series of co-creation workshops. Redesign of conversation script, three iterations of templates tools to support care request conversations, and a new database tool.	1 care institute acted as problem owner during entire case. Their current conversations with clients about planning care were used to test the design interventions.
2	Family conversations about >10 years ahead	What are needs, motivations and dynamics in and around such family conversations? Can people discuss future issues (>10yrs) that are not urgent now?	How can family members be supported in sharing thoughts and expectations in relation to each other when there is no urgent issue (yet)?	Series of co-creation workshops. Five design iterations of a family discussion tool consisting of script, templates and game elements.	6 parties (municipalities, health insurances, and HR institutions) acted as domain experts. 2 of these parties acted as problem owners and used the last tool version in their practice.
3	Elderly people speculating about the future together	What dynamics play a role when people speculate together about the future if they think they don't have much future left?	How can we challenge people to look ahead together further than tomorrow and see more options towards their own futures?	Series of co-creation workshops. Series of staged social activities in which future is addressed to provoke speculative future thinking.	1 care institute acted as problem owner during entire case. The involved persons are 'social innovators' within their institute.

The cases evolved through opportunities to intervene in practice and happened in chronological order. While forming teams, we discussed process, output, roles, and relevant deliverables and all felt a need to bring clarification to these issues. To respond to this need the researchers created visuals of what stages and activities an RtD case study compels and proposed that each team needs to have at least one of the roles in figure 1 fulfilled by team members (actors). The initial description of these roles was a first ordering in the process. One actor could take more roles, and multiple actors could take one role.

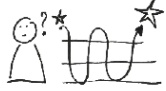
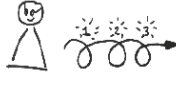
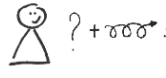
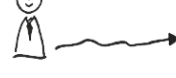
<p>Theory researcher role: theory building, research question & set up</p> 	<p>Designer role: designing interventions</p> 
<p>Design Researcher role: user research generating insights</p> 	<p>Problem Owner role: improving practice</p> 

Figure 1 First suggestion of different roles that could exist in an RtD case study in practice (later two other roles were added to the roles template)

Furthermore we developed a tool, the Reporter Kit, based on the work of Sleswijk Visser (2009), van Asseldonk et al (2016) and Dalsgaard and Halskov (2012), to document reflections and decisions of each team member along the process (see figure 2). We deliberately choose for a simple form, with only three questions; ‘What happened?’, ‘What decisions did I make and why?’, and ‘Doubts, ideas, expectations, considerations, plans...?’ This reporter kit was also intended to gain insight in how each of the actors experienced the collaboration while conducting the case studies and being able to intervene in roles to optimise a productive process.



Figure 2 The Reporter Kit is a journaling tool in which each actor reflects on his/her role(s) during the process. Each colour presents one specific role. For example the light yellow represents the designer researchers role and the dark yellow the designer role. This picture shows a reflective session of case two, where some of the actors fulfilled multiple roles.

Exploring different configurations of roles

Figure 3 shows how the roles were distributed over the three cases as the case studies unfolded. The figure shows that new roles were added to the initial suggestion of roles in figure 1. For each case the teams were differently composed based on the present expertise and availability. Actors A and B represent researchers with design research expertise from academia or design school. Actor C, D, E represent parties from practice, e.g., care institutions or design agencies, of which actors C had most substantial hours to dedicate in each case as part of the funding structure. Over the cases different people were involved as actors A, B, C, D and E.

Roles ↓ Actors →	Case 1					Case 2					Case 3				
	academia A	academia B	C	D	E	academia A	academia B	C	D	E	academia A	academia B	C	D	E
Theory researcher theory building, research question & set up	●					●	●				●	●			
Design Researcher documenting & generating insights		●					●	●				●			
Design Researcher organising & practicalities user research		●	●					●				●	●		
Designer role designing interventions				●				●				●			●
Problem Owner improving practice					●				●	●			●		
Project Lead planning and team		●					●	●				●			

Figure 3 Depending on involved actors, their expertise and starting point for case study, the roles were differently assigned in each case.

In case one it was initially planned that actor C would take the lead, but when setting up the case, this person didn't feel comfortable taking the design researcher' and designer' roles. This actor had extensive experience in conducting fieldwork and was well acquainted with the domain, but didn't have design expertise or overview of the RtD process;

'You need to take me on the hand with such methodologies and set up the case, so I can follow you, and I can execute user research activities (recruiting, conducting interviews, observations)'

'I am not a designer, I can't facilitate these co-creation workshops or design the interventions'

The researchers (actors A and B) realised that one of them was needed to take the lead. All three discussed what tasks each of them felt comfortable with, and what was practically possible. The roles template served as a point of reference for needed expertise and they made decisions on collaboration: Actor A took the theory researcher role and would only be involved in collaborative sessions. Actor B took the design research lead role and actor C would assist in organising the fieldwork. Assigning these tasks already yielded for two types of design research roles; one mainly focusing on generating insights and the other one on organising fieldwork. Furthermore they realised that design capacity would be missing, because each of them would be fully taken by more research oriented roles. A design agency (actor D) got involved to explicitly design the series of co-creation workshops and design interventions. Actor E took the role of problem owner (see table 2).

The second case didn't start with a concrete challenge from one problem owner, but with a shared interest in possible outcomes of the case study of six different parties. They were involved as domain experts in a series of insights sharing and co-creation workshops and two of them were involved in testing the last design iteration in their own practices. A design agency (actor C) led the case study as project lead and fulfilled three other roles; the designer role and both design researcher roles. The roles template was used as an instrument for actors A, B and C to define their collaboration at the start of the case (see figure 4). Discussing this made explicit that actors A, B and C had large overlaps

in capabilities. Realising these capabilities and expertise helped planning the entire project and their collaboration. For example each took responsibility for facilitating and documenting workshops with domain experts, for different user research activities and planned when joint expertise would be needed. An explicit new role ‘project lead’ (last row in figure 3) was added to the roles template (already halfway during the first case) to explicitly extract tasks of project management, such as project planning and teamwork. Actor C took the project lead role, and actor B would take this role when actor C would be less available.

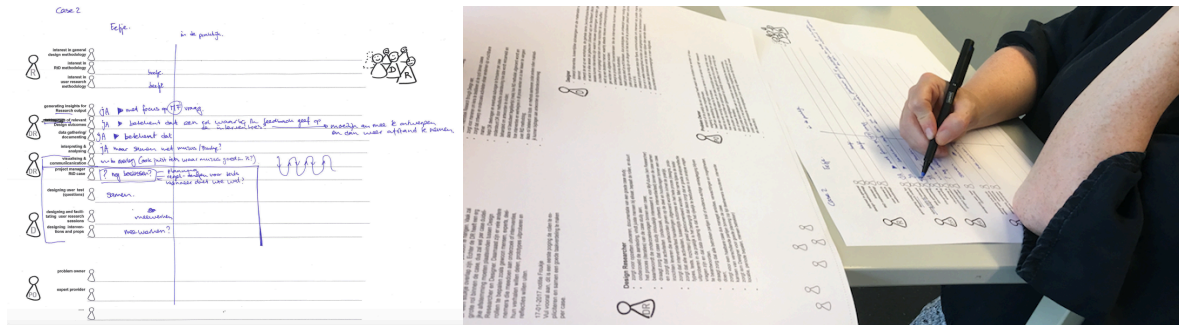


Figure 4 One of the actors reflecting on tasks and responsibilities she would feel comfortable with in relation to the other team members using a roles template.

The team composition of the third case was again very different from the first two cases. Actors C were domain experts but also social innovators within their care institute. All wanted to collaborate but didn't know each others' exact expertise, which made it difficult to directly assign roles. Actor B took the project lead and took multiple roles of design researcher and designer. The roles template helped actor B to discuss with actors C what was expected from conducting an RtD case study together and proposed several options of how actors C could contribute to different types of research and design activities. This helped in assigning dedicated tasks for actors C, in which they felt comfortable, such as organisational tasks and what to collect as data.

Use of reporter kit in halfway sessions

The reporter kit was not always consistently filled with annotations of each team member, but enough to gather relevant insights on case content and collaboration. We adapted the reporter kit as soon as when new roles were added. After the first case we also changed its template to give the third question (*Doubts, ideas, expectations, considerations, plans...?*) more space since this question revealed most interesting data.

Splitting roles and documenting thoughts on each role helped in sticking to 'your task'. For example the person in the designer role expressed thoughts as:

'Should we really transcribe all these conversations? It is quite some work, I would do this differently with my design agency, I think. But maybe I can also learn from this and see what it brings. For now I focus on producing the next templates design by Friday.'

The reporter kit of the problem owners documented a lot of insight in their thoughts along the case study process. In contrast to the other roles, people in the problem owner role did hardly reflect on process issues, but shared their thoughts on their everyday work in the reporter kits. For example one problem owner reflected on her own role in her daily work.

'Maybe I should propose this [...] earlier with client B....'

'I am going to change the evaluation forms, where clients not only evaluate the care provider, but also our role'

Such reflections provided rich insights on how low hanging fruit ideas were immediately implemented during the case study.

Furthermore we observed that design decisions were not well documented in the reporter kits and concluded that the form (one A4 printed paper with three questions) didn't stimulate this enough. At the end of the first case we decided that we need better documentation of design decisions beyond reporter kit and created an online document to keep a record of design decisions. In the other cases this shared document with design decisions was experienced as very helpful after, but especially during the process, because actors in the designer role had more dedicated conversations together what to document. This made them more aware of the many little decisions they made that eventually had large effects on the actual design that was used in the interventions.

Using the reporter kit annotations as data to evaluate the process of collaboration through the assigned roles halfway the case studies helped in adjusting fruitful collaboration. For example in case one the team noticed that the reporter kit of actor B only showed thoughts on project management level and missed research focus. When observing and discussing this, it became clear that organising the case study as a project was a large task that overruled the task of generating research insights. Even though actor C helped in organising the fieldwork, doing field observations, joining design iterations, analysing, organising sessions, updating everyone and managing all overruled the focus of generating relevant research insights. The team added an explicit new role of project lead in the roles template and in the reporter kit. They also planned more frequent meetings between actors in the theory researcher role and design researcher role to discuss research questions and analysis developments. As a result in case two and three the focus of actors in the design research roles was more evenly balanced between research and application outcome.

6. Insights on collaboration in Research through Design

Through the series of these three case studies we have experienced how assigning roles helped organising the RtD case studies. Finding opportunities in practice for design interventions through an RtD approach is a process which is difficult to plan ahead or control from the start. Being aware of different roles helps in planning, integrating expertise, dividing responsibilities and collaboration of all involved stakeholders. From the experience of these three case studies and the adaptations we made on the way during the case studies, we have learned insights that might be relevant to other RtD practice that follow a programme approach (Binder & Redström, 2006). Here we share our findings on the interplay of research and design, documentation and taking roles in collaboration.

On the interplay of Research and Design

Through the case studies we intervened in the phenomenon (people planning their own future lives) with the aims of (1) describing the phenomenon in context and (2) based on this understanding to formulate directions for improvement. In table 3 we summarised five levels of outcomes we identified through this project. From top to bottom, the outcomes range from research oriented to more application oriented. These levels of outcome relate to the different roles, but only in terms of main focus for each role. By discussing these levels generating outcomes has become a shared responsibility for all team members.

The main aim of the project was research driven; generating new knowledge about the phenomenon. However, the societal context of this phenomenon is under change: municipalities, organisations, and citizens in the Netherlands are dealing with a transformation from a welfare state to a local 'participation society'. Therefore describing the phenomenon in this changing context (fourth level in table 3) was more relevant for this project than producing pure theories. Guidelines (system level) and concepts (service level) were further developed as deliverables to impact practitioners and policy makers beyond the participating stakeholders in the assigned project. Small-scale solutions served as demonstrators to illustrate insights on the phenomenon. Several small-scale solutions were also directly infused in practice of involved parties. For example in the first case numerous insights and low hanging fruit improvements were directly implemented by the involved problem owners.

Table 3 Five levels of outcome ranging from research oriented to application oriented we identified in our RtD project, which helped in creating a vocabulary for what is aimed at in a multidisciplinary team.

Outcome of RtD	What it is	Example from first case study that studied care request conversations
Knowledge	Theory constructs of phenomenon	Theory framework presenting theory variables and how they relate to each other
Contextual knowledge	Better understanding of phenomenon through combining knowledge from various disciplines, trends in political system, future thinking and user research and prototyping in various practices.	Timeline showing moments where people are more receptive to think about personal futures and strategies how to stretch their future thinking.
Guidelines	Directions for innovation strategies for service providers and political institutions beyond the involved parties presented in visualisations such as design documentaries, opportunity maps, and series of workshops etc.	Journey map presenting ideal care conversations in different moments of people's lives.
Concepts	Concept ideas that emphasise an added value for users and providers in the system.	Business model for new service as pre-care planning conversations
Solutions	Directly applicable concepts immediately implemented	Templates and scripts for care planning conversations

Research and design activities were closely interwoven. We experienced that collaboration of all actors in design activities was very fruitful. Through collaboratively framing the problem and solution space, many insights were brought in by domain practitioners, but also were directly fed back to them on different levels. In research activities the collaboration with domain experts was slightly more staged. Domain experts joined in fieldwork and analysis sessions, but design researchers conducted in-between activities such as preparing, articulating and visualising relevant data categories to facilitate joint production of insights. To conclude, domain experts were involved in various design activities, while their involvement in research activities was more thoughtfully staged.

On documentation

The Reporter Kit documented process data from the perspective of each role and made visible how things have changed along the case. Using a tool like the reporter kit with only three simple questions on one A4 format did not document all relevant process data, but by jointly sharing each perspective halfway during the case, it helped the team to communicate and discuss aspects which otherwise would have remained tacit. Especially having documented thoughts of the actors in problem owner roles on directly applicable aspects of the designed prototypes was helpful in coining results of a case study on a solutions level. Another positive effect was that it reminded each team member to be aware of their role(s) in the process. Team members who fulfilled multiple roles were supported to deliberately shift between roles and focus within the case studies. It also helped the entire project team to evaluate the methodology and improve the collaboration.

To conclude, the reporter kit is a tool that requires little work for all involved members and tracks enough interesting thoughts to steer joint reflection and to remind each one on their role in relation to the others.

On collaboration

Defining and assigning roles helped making available expertise and assumed contribution and responsibilities more explicit. Personal traits and expertise vary greatly from person to person, regardless position or title. Through this open way of collaborating but meanwhile framing expertise through roles helped mapping opportunistically each team member's contribution and adjust when needed.

The roles we implemented in this project are not an off-the-shelf, one-size-fits-all solution for RtD projects, but distinguishing roles helped structuring the collaboration, while affording openness to build on personal traits, skills and emerging opportunities in the domain practice. It is a flexible yet systematic approach. We also noticed that the project lead role was always combined with at least one of the other roles and imagine it would be rather difficult to manage an RtD project while not being involved in the complex process through other roles. Each project will form its own team composition, but applying the roles in combination with the reporter kit tool helped structuring the collaboration.

Although each RtD project can have a different set up or be part of another category, and roles may differ, we would like to share our observations about the role of design researcher, because that role included many different capabilities. We identified several components to the design researcher role:

- Organizing skills, getting people on board;
- Shifting between abstraction levels;
- Shifting from knowledge to solution;
- Facilitating all actors in the process, working with people, talking their language;
- Using visuals and aesthetics to pinpoint at intermediate results;
- Making props in collaboration with designer's role;
- Conducting user research, recruitment, field work, observation, interviewing, analysing.

The last one, conducting actual research work, is a large time consuming task that should be made more explicit. We learned that this task easily draws attention from other tasks. Arranging and organising user research activities just absorbs time and focus easily. To highlight this pitfall, we proposed to distinguish two roles of design researcher; one focusing on generating insights and one on practicalities of fieldwork. In the second and third case studies the actors fulfilling these roles also took the project lead role. By being aware of the different roles they were better able to focus on the activities that were most important and collaborate fruitfully. The assignments of the roles are not distinct, they have large overlaps of expertise, responsibilities, activities and tasks.

To conclude, defining roles helped the team per case to discuss each team member's contribution and being able to flexibly adapt these along the process. Through positioning explicit roles, though they overlap greatly, we were able to organise case studies with the main task of generating knowledge through design interventions. The division of roles provided structure to the process and supported in collaboratively generating insights on the different levels of knowledge, guidelines and solutions.

7. Conclusion

In this paper we explored the process of three case studies in which domain practitioners, designers, design researchers and researchers collaborated in different ways. We illustrated how collaboration in a complex RtD project can be structured through explicitly assigning roles and using tools to integrate perspectives of all involved actors.

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