Let’s put the knowledge in practice!

Froukje Sleeswijk Visser

*ID-StudioLab, Faculty of Industrial Design Engineering, Delft University of Technology, The Netherlands, f.sleeswijkvisser@tudelft.nl*

**Abstract:**
Research through Design is an approach to combine research and design activities to generate knowledge. Although there is no established standard (yet) on how Research through Design should be conducted, my research project is largely based on this approach and borrowed several elements from other approaches in social sciences as well. Aim of the project was that the research results were both theoretical and practical, and its results would be disseminated to both researchers and practitioners. In this paper I discuss how this was realized in the project, and what this could mean for further development of the approach.

**Key words:** Research through Design, design guidelines, knowledge diffusion

1. **Introduction**
In the design discipline, ‘Research through Design’ (RtD) is an emerging approach where the act of designing and creating new solutions are essential steps in generating knowledge: considerations and reflections during the design activity contribute to the findings [1]. In design, products are created for the future: a world that does not yet exist and cannot yet be observed. This makes the design step valuable in research, especially in exploring areas where we do not yet know what are important factors. The approach is based on designing structurally varied, experiential and product relevant prototypes and generating knowledge by the process of building and evaluating these prototypes in real-life settings [7]. Both designing the prototype, and evaluating it in practice, can generate knowledge [9]. However, this approach is new and guidelines and criteria for research procedures still have to be developed. Existing descriptions of RtD [1,7,9] guide the process of creating and evaluating prototypes in practice, but do not provide sufficient guidance to analyse and structure the findings. When I was setting up my PhD project, I particularly missed three aspects in the RtD approach:

- How to capture and organise the findings from the different activities?
- What criteria can be used to judge the quality of the process and findings?
- How to serve the different audiences?

Brandt and Binder [3] compared three PhD projects that claim to have applied this approach, and concluded that the easiest way so far seems to be adopting ‘conventional’ research strategies borrowed from research communities outside design research. In my PhD project I also made use of strategies from ‘conventional’ research. In this paper, I describe how I structured the research project and how I aimed to serve the different audiences.
2. Problem statement of the PhD project

The PhD project dealt with communicating user experience information in design [8]. Product development companies want to learn more from users in the early design process, and several methods have been developed to research user experiences (e.g., cultural probes, contextmapping), but knowledge is lacking about using such results in innovation projects. A ‘what’ and a ‘how’ question were formulated to start the research;

- What elements play a role in successful communication of rich experience information?
- How can rich experience information be successfully communicated in the design process?

As a researcher I wanted to stay as close as possible to actual design practice in industry to increase the relevance of the work. As a designer I wanted to make new tools for user experience communication, because the state of art has not been so successful in this field so far. Moreover, I wanted to serve the different audiences (design researchers in academia and design practitioners in industry) by sharing my findings in a way that they can understand and use them. Researchers are interested in new theories and frameworks and practitioners are interested in hands-on guidelines and examples which they can directly apply in their work practice.

3. Borrowing elements from other approaches

I borrowed elements from qualitative research approaches from social sciences and combined these with RtD; Practice-led research, Action Research, and Grounded Theory. In this section I explain what elements were useful in this PhD project.

In Practice-led research [6], the process, the creative piece of work and its effects are part of the research findings. The created work is a demonstration of the theory, and itself conveys the findings in ways the academic writing does not. In my PhD project, the tools that were designed were carriers of the knowledge as well.

Action Research [2] is an iterative process involving researchers and practitioners acting together on a particular cycle of activities, including problem diagnosis, action intervention, and reflective learning. The researcher intervenes in the practice in order to improve the practice collaboratively and to further the goals of science simultaneously. In my PhD project I also intervened in design practice and worked together with practitioners, playing the role of a design practitioner (designing new communication tools) as well as a researcher (intervening, observing, and reflecting on the communication phenomenon). One difference with Action Research is that instead of iterating cycles at one company, I explored the topic in a wide variety of product development companies (from small design firms to large multinationals). My aim was not to engage and dedicate my efforts to improving one system in one company, as is common in the Action Research approach, but to extract and compile knowledge that is relevant across companies and practitioners.

Grounded Theory [4] is a qualitative research approach that has the purpose to develop new theories that are grounded in the data rather than fitting existing theory onto a phenomenon. In Grounded Theory, everything is data, i.e., the researcher’s interpretations as well. Collecting data and analysis are simultaneous activities, which I adopted in my approach. For example, taking design considerations as part of the data collection. To summarize, Practice-led Research and Research through Design encourage researchers to build ‘things’, and take the considerations for the design of the ‘thing’ as research data into account. Action Research promotes interventions to be able to unfold the phenomenon in question and to aim for improvement of the practice being studied. Grounded Theory embraces the openness of the researcher in relation to the phenomenon and provides room for the researcher’s interpretations as part of data collection.
4. Structure of the PhD project

The project (see figure 1) started with the scaffolding for a theoretical framework based on literature review and previous experience. The framework contains the aims (top) and means (bottom) of communication, and a middle space for the connections (dots) that the case studies uncover or create. This framework got filled in iteratively in eight case studies in design practice. The findings from each study update the framework and served as a starting point for the following study. The framework is a direct reflection of the gained knowledge and the reality of the previous studies. The set of studies was not planned in advance, but developed along the way. The studies and the framework informed each other in turn. Together with opportunities from practice (e.g., a company interested in collaborating) the framework guided the research journey, a process of discovery, rather than evaluation.

Figure 1. The project consisted of a theoretical framework that was iteratively filled in based on a sequence of eight case studies. The case studies were written in newspaper style stories, each headed by a main quote from the study, in order to appeal to a practitioner audience.

- To capture and organize the findings from the different activities I described the case studies as detailed stories. Each case description addressed one part of the framework, and contained research and design sections such as ‘design considerations of the tool(s)’, ‘method’ (which differed for each study, e.g., studies 7 and 8 were Action Research), ‘observations’, and ‘conclusions’.

- The scientific quality of the research was guarded by three indicators that are widely accepted in the qualitative research community; reflexivity, relevance and validity [5]. The latter two are generally accepted in science. Reflexivity is defined by Malterud as ‘an attitude of attending systematically to the context of knowledge construction, especially to the effect of the researcher’. Reflexivity is like the researcher’s mirror. The researcher’s background, position and attitude have influence on how the research is set up, how the questions are formulated and how the methods are judged. Combining design and research activities simultaneously made it necessary to document the observations, intentions and choices very well.

- In order to serve the different audiences, the findings were diffused by several ways: a doctoral thesis and journal articles, workshops and courses, the prototypes of communication tools themselves as carriers of knowledge by example, and the collaborations with practitioners in the studies. The thesis presented a
scientific piece of work. Usually theses are read only by peer scientists, who would focus on the framework. To serve practitioners as well, I included a chapter with guidelines, tips and tricks illustrated with examples. The framework answers the ‘what’-question above, the guidelines the ‘how’-question. The detailed case descriptions serve as a ‘glue’ between the audiences: they allow both researchers and practitioners to dig deeper and see were the findings come from (researchers) or as illustrations how the guidelines can be applied (practitioners). The developed communication tools during the studies can be seen as prototypes and they are the carriers of the (even implicit) knowledge. During the PhD project, I have already seen several of these tools being copied, adapted and adopted in design practice. Concluding, the new knowledge resides in the publications, the developed tools and by exchanging experiences with practitioners.

Discussion
Research through Design seems a promising approach to exploratory research, but it is not a formalized method yet. I hope to exchange experiences with other design researchers and develop this method into a more formalized method, providing guidance and structure to plan the research, to ensure the scientific quality and last but not least to take into account how to reach the different audiences. I would suggest that publishing design guidelines based on the research, especially on the design considerations taken and their effects, should be part of projects with a Research through Design approach, because it supports design researchers in organizing their findings and it serves the different audiences as well.

References