

Designer-centred design research

Design techniques as a bridge between design research and practice

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Abstract: This paper demonstrates how a reworked conceptualization of method takes into account the designers' goals as well as the nature of their activity. In that, the paper seeks to make a conceptual step in how we as design researchers approach and influence what designers do in their practice. This paper presents careful observation of and intervention into design activities as an essential link between design research and practice. In this, it reconceptualises what is now known as method as part of the design activity. Because of the expectations that have become attached to the term method, we choose to develop and provide techniques to designers instead of methods. By not only focusing on the process of the technique, but also the way that designers can take it up in terms of its fit with their knowledge, flexibility, experience and learnability, as well as the way designers can use to support their goals and communication, we make a new kind of contribution as design researchers to design practice. The 'designer-centred' development of techniques creates a new and essential link between design research and design practice.

Key words: *techniques, design methods, designer-centred, ingredients, complexity*

1. Introduction

Designers are focused on their goals of catering for society and industry. As design researchers we have the time and can conduct the depth of study that will ensure that designers can adopt and adapt new techniques in their activity that serve them well in pursuing their goals. In the past, studies that were aimed at developing support for designers have been predominantly focused on the development of design methods. We will argue for a reconceptualising of the notion of 'method'. This serves to ensure a productive bridging between design research and practice.

The concept of method stood central when the design research community was formed of which this conference is a part. The community had one of its geographical centres in the UK in the sixties of the previous century. As commentators noted, design methods were initially conceptualized in order to give design weight and legitimation in collaborating with the dominant technical rational approach of engineering (e.g. Bürdek, [4], p. 106). Design developed process-oriented methods because it sought to establish itself as a dialog and business partner for the engineering and managerial disciplines. This design methods movement had a turbulent history, famously being completely rejected by some of its earliest proponents such as John Chris Jones and Christopher Alexander because it ran the risk of becoming completely immersed in technical rationality ([9], p. xi). Yet it was also pragmatically developed by others such as Bruce Archer and Nigel Cross who went on to nurture design research as an academic discipline, integrating tacit aspects of designerly knowing, thinking and doing into design research (as discussed e.g. by Niedderer and Reilly, [10]). Nonetheless, the design research community, and

recently particularly the German design research community is still engrossed in lively discussions of the relevance of design research to design practice (e.g. Bürdek [4], p. 181). What has taken great flight is the development of direct and pragmatic design research methods to integrate user needs and desires into product development (user-centred design). Yet some argue that this is not really a transfer of design research to design practice. It is merely research on the level of tools within projects, not on the level of practice. Many design researchers still lament, as Dorst [7] analysed, that “many professional and experienced designers say that they do not use methods”. There is a dearth of demonstrated successful transfers of methods from design research to practice. On the other hand, many design companies, almost all perhaps, develop and propagate their own custom design method. This has an important role in their own company brand: they face the challenge of selling what they do, why it takes time and what they do with the time. By presenting it as an integrated method they can argue better why all of it is needed, or they can negotiate which parts they will consult on. So if design consultancies make their own methods (which are often derived from design research), is there any need to try and urge design methods on them that design researchers develop?

Perhaps as design researchers we should not strive to urge something on practitioners if they do not ask for it. Yet the need is there, as Friedman [8] indicated: “the emergence of a new professional training was not accompanied by the deeper understandings of ontology and epistemology that serve as the foundation of other fields”. We still need to mature the field and make it demonstrably effective in the new conditions of complexity. For the past forty years, the field of design research has been steadily influenced by developments in the human-computer-interaction discipline. Concepts like product semantics and affordances found their way into design research. Yet the field of design research was simultaneously growing apart from design practice. The gap between methodological accountability and precision on the one hand, and the necessary situated intuition and flexibility in communication that characterises design practice on the other hand, seemed insurmountable (see also [11]). A bridge is needed. Which routes do we as design researchers have available to work together with the design field to achieve a better use of knowledge and a greater capability of critical thinking? As an intention this is not new, in fact it was what led John Chris Jones to start developing design methods in the first place ([9], p. x). What has changed are two things: our insights into design activities and the goals of designers who seek to serve not just industry but also society directly. This paper makes use of an example from our own recent research, the development of a technique to support designers, to identify what is key in what we as today's design researchers can contribute to design practice. The development and content of the technique has been presented earlier. [17, 18] The example is used here as a thinking tool.

2. A bridge: how can design research deliberately undertake to affect design practice?

How can a deliberate attempt to affect design practice be conceptualized? Friedman's [8] contribution is a case in point: his paper recently received renewed attention in the design research discussion because it addresses the relationship of theory and practice. While the paper provides hugely useful pointers to areas of theory that conceptualise learning action systems, it remains regrettably general on how research affects practice: “Research serves the field through generating direct, concrete, applications. Research serves the field by solving problems that arise from the field itself. Research serves the field by considering basic questions and issues that will help to shape disciplinary inquiry and fields of practice both. Research serves the field by opening inquiry into basic

questions that we haven't yet begun to ask." These suggestions address how design research knowledge filters through to practice and serendipitously affects it. It does not state how a design researcher could deliberately undertake to affect design practice.

2.1 Undertaking to deliberately affect design practice: from method to technique

In approaching this undertaking we need to critically reconsider the notion of method. Since their inception in the 1960s, design methods developed by design researchers have continued to receive criticism in terms of their applicability [7]. A new source of critique of methods has joined those voices as well: the participatory design field is more heavily influenced by human-computer interaction (HCI) research than the industrial design field has been. Participatory design researchers encountered a conceptualization of methods as literal, rigid prescriptions of action, as derived from informatics. This caused many problems because any failure would be attributed to the application of the method rather than the method itself (Ehn, personal communication during PDC 2012). Woolrych et al [22] also lamented greatly adverse effects the notion of methods had in HCI. Woolrych et al [22] advocate designing ingredients for practice that practitioners can use to create their own meal, their own practice. The ingredients need to be specific to a design situation and problem. To overcome the rigid prescriptive nature that designers might associate with the term 'method', we prefer to use the term 'technique' for the support we developed. This technique could then potentially be used as an 'ingredient' of designers' own activity.

2.2 From process to activity

So while the application needs to be specific, it needs to be specific to the situation that the designers are in, rather than to the actual content of the design project. In the past forty years, important progress has been made in studying the design activity from a variety of disciplines such as design research itself, as well as philosophy, psychology, sociology and anthropology. To name a few prominent examples, Darke's [6] seminal paper suggested that designers work from particular cognitive self-limitations, a 'primary generator' rather than the full complexity of a situation. The study of the design activity as it takes place revealed its value, such as the artful integration of successive insights about the problem at hand (Schön [14]). Oak [12] showed how designers interact with the situation before them and devise courses of action collaboratively in that. These findings revealed for design research that there was not just value in supporting the goal of design, but also in taking into account and supporting the activity. This, Schön [14] argued, would enable designers to become better professionals in the service of society. The focus on the activity as it takes place is an important part of the bridge between design research and practice. It enables us as researchers to align ourselves more reliably to the design activity. As a framework for studying and addressing the design activity, we refer to its anatomy as described by Dorst [7]. He states that to describe a complex creative human endeavour like design, one should consider not only the content of the design problem and the emerging solution, but simultaneously the design process, the designer and the design context. Within design research, the emphasis on the design process is still overwhelming. Although models of design processes have been a great success, the design process is only a part of the bigger story of design. The content of the design problem and solution are more and more studied within content-oriented research streams like 'experience design', 'design and emotion' and 'design for usability'. However, we still tend to 'bracket the designer and design context' (Dorst [7], p.6). This research acknowledges this and seeks to address these designer and context aspects of the design activity, as well as the goals and needs of designers. This designer-centred approach, it is expected, can improve the uptake of design techniques by designers. Exploratory

work by others [5] has similarly argued for such an approach. We seek to explicitly demonstrate a bridge between design research and design practice. Regarding the goals and context of designers' work, Dorst [7] reminded us that designers are operating in a dynamic arena. Designers now seek to work with strategic deciders, help the human work of CEOs or organisation leaders [e.g. 20], or support people in organising change [e.g. 13]. Designers need to respond to globalization by changing up the game, taking the lead [7].

Lastly, Friedman [8] raises the challenge for today's designers that: "professional excellence requires articulation". This is a significant challenge: if we seek to contribute something to design practice, we need to support design practitioners in articulating their goals and activity. And we need to articulate ourselves what we contribute and why and how it is a contribution, to ourselves meet the standard of professional excellence. In this paper we articulate how our technique proposal seeks to affect the designers' goals as well as their activity. The considerations laid out so far are summarized in Table 1. In the following, we present a case from our own practice as design researchers to indicate what these considerations actually mean when applied. In this, the emphasis is on the overall development and evaluation of the technique rather than its content. The detailed development in terms of content, and the content of the technique itself has been reported previously [17, 18].

Table 1. A change in perspective of design research, from a previous to a new conceptualization.

Previous conceptualization of design methods as developed by design researchers for technical rationality

Design research	supporting ->	Designers' goals	towards ->	Industry
Contributing rigour, flow charts, mathematical modeling		Seeking to connect with industry. Turning design-inherent flexibility, intuition into structured processes. Designers' communication: link with engineering processes		Product engineering processes
Design research not looking at		Designers' activity		
		Flexibility, experience of their practice		

New conceptualization of design techniques as developed by design researchers for a complex society

Design research	supporting ->	Designers' goals	towards ->	Society & Industry
Provides (e.g.) well-supported insights into human-product interactions (content), insights from design research and other disciplines in designers' communication needs (context), applies insights iteratively (designer-centred)		To work with strategic deciders, help the human work of CEOs or organisation leaders [e.g. 20], or support people in organising change [e.g. 13], and respond to globalization: change up the game, take the lead [7].		Human-centred innovation, experience economy, well-being, complex interfaces and interactions, sustainability scenarios and experiences
Design research	also supporting ->	Designers' activity	in and for ->	Society & Industry
Revealing the potential of design as activity in influencing agendas and taking leadership		Taking ingredients from the designers' understandings and integrating them into supportive approaches that are flexible, learnable, appropriate. Supporting designers' communication: argumentation (e.g. on user research insights), inspiration (scenarios, experiences).		Integrate design thinking into innovation

3. Case: supporting design teams' engagement with product use

We chose a 'designer-centred approach' to ensure that we developed a technique that would successfully fulfil the needs of practitioners, as advocated by for example Wixon [21]. Over a period of three years and through careful iterations, a workshop technique was developed that engaged both with the designers' goals and their actual activity. This paper only focuses on the way that such a technique forms a bridge between design research and practice by going into the development steps and the evaluation of the technique. The technique differs from previous design methods as conceived under the notion of technical rationality. These were usually directed at supporting the designers' position in relation to the goal of their design. The technique proposed here is directed at both the designers' *goal* and their *activity*.

3.1 How does the technique look at designer's goals?

To define the designers' goal that our technique should connect with, we started our research with descriptive studies of how designers and design teams apply user-centred design within their design practice [2, 16]. We found that apart from formal user-centred design methods such as user testing, they relied to a large extent on knowledge gathered in 'informal techniques' such as testing prototypes themselves or with colleagues or friends. We also found that this knowledge was often not shared between team members. Yet they expressed the need to convey their design steps and outcomes within the team and towards others. Based on these insights we then started developing a workshop technique that aimed to support design teams in sharing this knowledge. Next, we developed a 'workshop prototype' that we iteratively improved by inviting design practitioners to execute it in a fictional design case. When the workshop technique had matured enough, we evaluated it in three real product development projects in industry. By basing our first workshop prototype on our descriptive studies in design practice, and subsequently iteratively developing the workshop together with design practitioners, we ensured the technique would address their goal, in this case the development of a 'shared vision on product use within product development teams'. We thus employed a 'designer-centred approach' towards the development of our support. The complete development process is visualized in figure 1.

3.2. The Envisioning Use technique

We named the final result of this development process the 'Envisioning Use technique'. It is a half-day workshop in which we bring all members of a product development team together to share their knowledge of product use and create a shared vision on product use. In the workshop we go through a number of steps such as remembering (storytelling), imagining (scenario thinking), experiencing (role-playing) and envisioning (prototyping), see figures 2 and 3. Although most of the techniques used within the steps are not new in themselves, the combination of the steps and the development of an explicit representation of the knowledge gathered within the steps (which we call a product use mind map) offers a unique contribution to the design process.

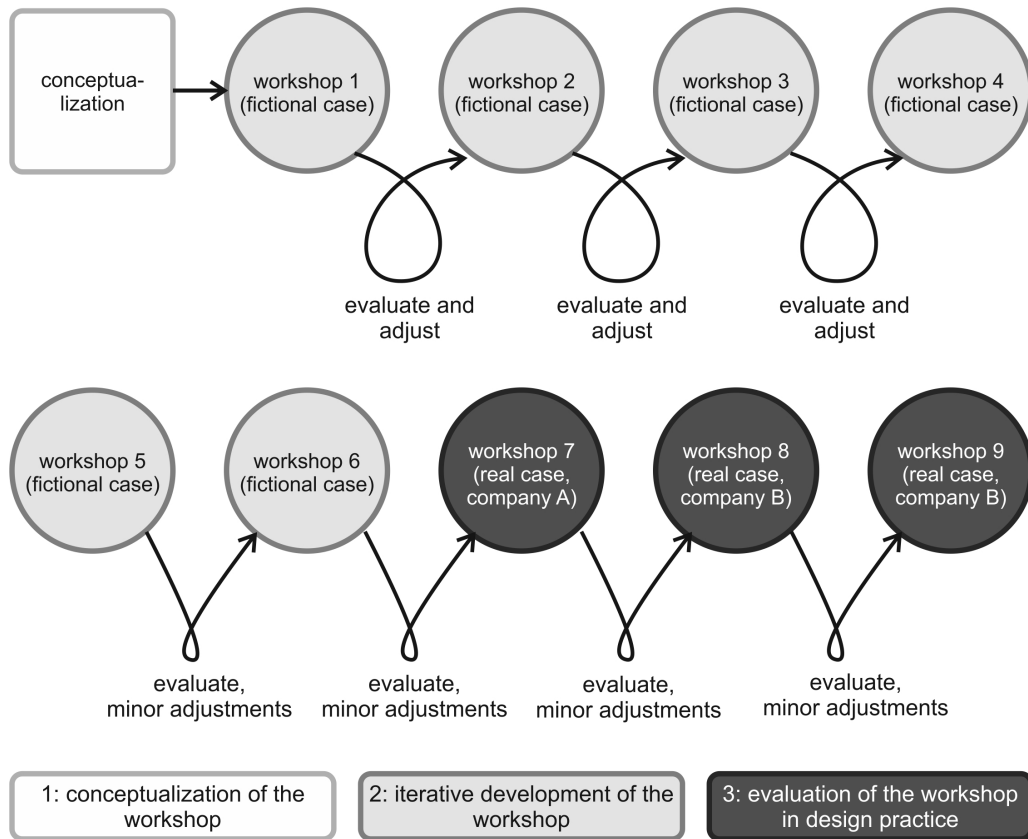


Figure 1: the iterative development of the workshop technique and its evaluation in design practice

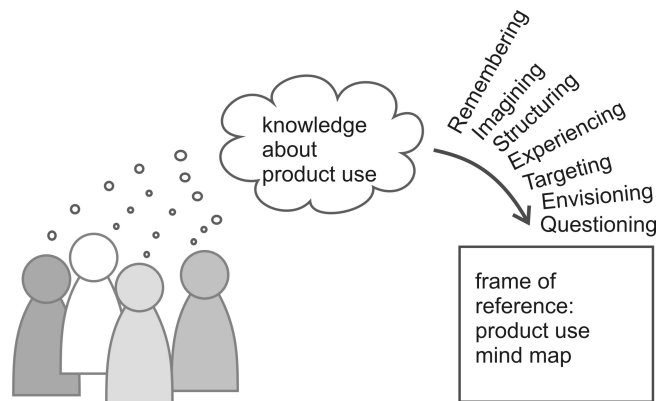


Figure 2: knowledge of product use made explicit in a 'product use mind map' through a series of workshop steps.



Figure 3: a design team employing the technique: working with the product use mind map

3.3. How does the technique look at the designer's activity?

In our studies we took the elements 'designer' and 'design context' of the design activity into account through:

- developing a support that was adjustable according to the level of knowledge of product use that designers have (designer characteristic). Our workshop technique started out with a step in which current knowledge and assumptions were mapped out, and it finished with a step in which questions for subsequent research actions were formulated. In this way the workshop could clearly connect to both preceding and subsequent design activities.
- developing a support that was flexible in its application. Flexibility was chosen as a requirement for our technique based on the notion that it is important for those who produce support for design practitioners to make 'incorporation' into designer's own approach possible [15].
- developing a dedicated introduction to our support by means of the creation of a manual that explains the technique in the designers language, and the development of workshop tutorials [3, 19]. This need for focus of learnability of the technique was mentioned by participating designers and also advocated by Blessing and Chakrabarti [1] who stimulate researchers to develop a clear 'introduction plan' for each support that is developed for designers ([1], p.160).

4. Findings

To summarize and referring to the design activity framework of Dorst [7], we tried to integrate our support for the design *process* for a specific type of *content* (usability and user experience in context of use), to the characteristics of the *designer* (in this case their knowledge of product use) in the design *context* (product development teams that want to share knowledge, need for a flexible approach, and an introduction of the technique that fits their needs).

After the iterative development of the workshop we sought to acquire evidence for the success of our technique in achieving its main goal: creating a shared vision on product use. We did this by facilitating the workshop technique in three real product development projects in industry. These studies showed that the technique indeed enabled teams to achieve this goal [18]. Participants also indicated that this shared vision positively influenced their decision-making in later phases of the product development process. The study thus showed that the technique formed a useful contribution to design practice.

Participants largely appreciated the flexibility of the workshop technique. They indicated that they saw opportunities for applying it at several other stages in the product development process, apart from the stage at which the workshop was actually performed. The learnability of the workshop was appreciated variably. While most participants had no problems with learning the technique through the tutorial, others indicated they found it difficult to learn how to deal with the format of the product use mind map we introduced to them. The introduction of this format therefore will remain a critical point of attention in future tutorials. Participants finally indicated the manual worked as a good reminder of the workshop steps, rather than as a stand-alone introduction to the technique. Some participants indicated they would integrate aspects of the technique into their own practice. These tended to be the champions of usability and user experience within their respective teams.

5. Discussion & conclusion

We have generated a technique through repeated engagement with designers. In some instances, we have found that the designers continue to use the technique on their own throughout their design process. What we showed here is how we deliberately took an influencing step as design researchers. This step has a demonstrated and explicated theoretical basis for specified steps within the design activity that are available for uptake and own creative incorporation by designers into their practice. With this, a reliable link has been laid. That link, or bridge, proved to be the careful - and iterative - study of and intervention into ongoing design activities. Such studies are applying concepts from disciplines such as philosophy, psychology, sociology and anthropology to the understanding of design practice. In combination with that, they are applying concepts from design and design research to the intervention into design practice. The generation of design researchers to which the authors belong is using this bridge to make a significant step in reinterpreting the notion of methods. The research insights mentioned above, our own experiential understanding of design practice and our drive to design our interventions well, lead us to apply a user-centred approach to the design of techniques for design practice. These techniques are no longer conceptualised as comprehensive procedures but rather as ingredients for practice. We expect that designers integrate and modify them in ways that we cannot predict. We therefore devote particular attention to the learnability, flexibility and appropriateness of the techniques we develop for and with design practice. The paper demonstrated this with the example of a recently developed technique that has been evaluated in design practice. As design researchers, we thus come to occupy a mediating position between understanding and design of design practice.

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