The use and evolution of design methods in professional design practice

Jan Fredrik Schønheyder and *Kjetil Nordby*, Institute of Design, The Oslo School of Architecture and Design, 0130 Oslo, Norway

Through interviews, observation and document reviews, we investigated how design methods are applied and developed in a Norwegian design company with a focus on safety-critical systems. Our analysis revealed that design methods are used and developed through pragmatic, cyclic evolutions which vary across projects. Particular methods are adapted to fit situational demands, designers' skillsets and the organisation of design activities. We introduce the pragmatic evaluation model*, a framework to cyclically evaluate and evolve design methods in professional design practice. The proposed model can provide opportunities for research aimed at understanding how design methods can be adapted and evolved to support professional design practice.*
© 2018 Elsevier Ltd. All rights reserved.

A common academic research field is the development and refinement of design methods with the aim of supporting design practice (e.g. industrial and interaction design). However, design researchers have critiqued the existing gap between design-method development in academia and its ultimate use in practice. This has been widely discussed in the human−computer interaction (HCI) community in recent years (Gray, Stolterman, & Siegel, 2014; Roedl & Stolterman, 2013; Rogers, 2005; Stolterman, 2008). The consensus is that most methods proposed by researchers and scholars are not applied in professional design practice because they do not acknowledge real-world contexts and lack applicability (Dickson & Stolterman, 2016; Gray, 2016). From the academic's perspective, practitioners appear to disregard the rigour and knowledge of proposed methods, and lack the skill to apply harder-to-use analytical frameworks (Rogers, 2005). On the other hand, designers are concerned that the information that researchers rely on has been drawn from the academic conception of practice rather than from designers' actual work practice (Gray, 2016).

Collectively, this suggests a gap between methods developed by academics and those developed and applied by designers in the context of their ongoing design processes. To bridge this gap, we suggest that it is important to gain

Corresponding author:
Jan Fredrik
Schønheyder.
jan.fredrik.
schonheyder@aho.no

a better understanding of the everyday use of design methods and how this impacts practising designers in commercial-design practices.

In this study, our aim is to develop a deeper understanding of how design practitioners use and interact with design methods in the context of commercial projects. This aim is in response to Stolterman's (2008) argument that HCI research has not been grounded and guided by a sufficient understanding of design practice, an argument that has been supported by later research such as that by Goodman, Stolterman, and Wakkary (2011) and Gray et al. (2014). Based on this argument, we focus on design methods that have been developed and used within a real-world context of a specific multidisciplinary design practice. In our study, we investigate one such practice to answer the question *How are design methods used in professional design practice?*

To create a more complete picture of real-world contexts, we employed a mixed-method approach in a specific Norwegian multidisciplinary design practice. Using results from qualitative interviews, observations and document reviews, we describe four cyclic stages that systematically develop and evolve design methods to fit a design object, project context and situation within a real-world context. Based on identified patterns and principles from this cycle, we outline an initial theoretical framework that aims to show how design methods evolve through an informal and practitioner-driven process.

It is important to note that a potential conflict in this paper is the primary researcher's position as an employee in the studied company. However, a close relationship of this kind allows access to in-depth and tacit knowledge (Sevaldson, 2010), and inherent biases can be overcome by combining multiple approaches and theories (Creswell, 2013).

Grounded in everyday design practice, the study contributes an in-depth account of how design practitioners apply and develop design methods in pragmatic and cyclic evolutions, contrasting commonly held views regarding the practical relevance of design methods. The study further contributes a framework for the evaluation and evolution of design methods aimed at supporting professional multidisciplinary design. The framework may help researchers within a multidisciplinary and commercial context adapt and evaluate their development of design methods to fit design practitioners' needs.

In the following sections, we describe the practice where the research took place, outline design-methods aimed at supporting practice and describe our research approach. We then discuss the results and how they compare with similar research. Finally, we reflect on how the study may contribute to similar fields of practice and research.