Making use: Attitudes to human-artifact engagements

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'Function' and 'use' are keywords that design researchers customarily employ when referring to human-artifact engagements. However, there is little consensus about how the concepts of function and use relate to each other, to the intentions of 'designers' and 'users', or to their actions and encompassing contexts. In this paper, I synthesize literature from design research, material culture studies, design anthropology, and function theory in order to critically compare different attitudes to human-artifact engagements, implicit in characterizations of function and use. I identify design-centric, communicative, *and* use-centric *attitudes, and discuss their assumptions and implications for design theory. I conclude by outlining principles for theoretically and computationally approaching use as an embodied and temporally contingent process — as a form of 'making'.*

Keywords: design theory, philosophy of design, user behavior, function theory, computational models

In the tradition of design research, 'design' is construed as a discipline in its own right, independent from its particular domains of application (Archer, 1979; Broadbent, 1988 [1973]; Cross, 2001; Jones, 1970; Slann, 1963; Spillers, 1974). By most definitions, the discipline of design includes in its purview rigorous awareness of material culture: the artifacts themselves and the activities of their production and use (Archer, 1979; Cross, 2001). In such definitions of design the term 'artifact' is invoked broadly to refer to objects, buildings, cities, systems or services, in short any *thing* produced or appropriated by humans to serve a need, goal, purpose, or activity (for example Archer, 1979; K. Friedman & Stolerman, 2012; Gregory, 1979; Rosenman & Gero, 1998; Rowe, 1991; Simon, 1996 [1968]). The connection of artifacts with the fulfillment of human needs or purposes, practical or otherwise, stems from a tradition of design research that has explicitly positioned itself as 'anthropocentric' (Archer, 1979) and human-oriented (for example Cross, 2007b; Jones, 1970). As a result, 'function' and 'use' have been central categories in developing descriptive or normative accounts of the design discipline's subject matter: artifacts, their production, and use.

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www.elsevier.com/locate/destud
0142-694X *Design Studies* **41** (2015) 137–161
http://dx.doi.org/10.1016/j.destud.2015.08.002

However, despite their pervasiveness in language and seemingly obvious meaning, the 'function' and 'use' of artifacts are notoriously difficult to characterize. Consulting the Oxford English Dictionary (2014), one finds 'function' defined as 'the mode of action by which anything fulfills its purpose' and 'use' as 'the act of putting something to work […] for any […] purpose.' Based on these colloquial definitions, one may say that 'function' is what an artifact does, while 'use' is what people do with an artifact (Crilly, 2010: p. 312). Artifacts, in turn, present an interesting duality (Kroes, 2002): they can be described as physical-material objects and also in relation to contexts of human purposes and action (Kroes, 2002: p. 291; Simon, 1996 [1968]: p. 5). It further appears intuitive to differentiate, at least provisionally, between two contexts in which this duality is manifest (Kroes, 2002: p. 297): the *context of design*, where 'designers' manipulate descriptions of the artifact's physical and relational properties (De Vries, 2008: p. 23), and the *context of use*, where 'users' manipulate the artifacts themselves for their own purposes.

This brief exposition begins to convey some of the questions and controversies that arise when it comes to theorizing the 'function' and 'use' of artifacts. Design researchers, for example, have engaged in numerous efforts to develop a working definition of artifact function (Hubka & Eder, 1982; Papanek, 1972; Pahl, Beitz, Wallace, Blessing, & Bauert, 1977; Roozenburg & Eekels, 1995) or systematize functional reasoning in the design process (Gero & Kannengiesser, 2004; Rosenman & Gero, 1998). However, philosophers of technology have been skeptical of the tight bonds between design and function ascription (Kroes, 2002: p. 288; Nanay, 2010) raising questions about how, if at all, functional descriptions in the context of design relate with the properties of the things produced or the ways they are used (Kroes, 2002: p. 300).

Conversely, over the past few decades, the domain of 'use' and 'users' has been consistently moving center stage in design theory and practice (Cupers, 2013). Acknowledged as a separate phenomenon irreducible to function (Lefebvre, 1968) and governed by its proper rules and tactics (De Certeau, 1984 [1980]), use has become a topic of widespread interest among designers. Design researchers have frequently cast use as a measure of good design (Hassenzahl, Beu, & Burmester, 2001; Tractinsky, Katz, & Ikar, 2000), as a driver of design decisions (Cupers, 2013), or itself as an object of design (Redström, 2006).

The categories of 'use' and 'users' have also been key in generating various 'genres' of designing, each with its proper methods and theoretical claims. 'User-centered' design methods, for example, enlist various tools from the human sciences and information technologies to acquire information about the context of use and anticipate form-context relations (for example Cooper, 2004; Margolin, 1997; Norman, 1998; Norman & Draper, 1986; Pucillo & Cascini, 2014; van Rompay, Hekkert, & Muller, 2005; Studer, 1980). 'Collaborative' and 'participatory' methods aspire to merge the context of design with