

# Design-oriented Research versus Research-oriented Design

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## ABSTRACT

In this position paper, the two terms *design-oriented research* and *research-oriented design* are studied and discussed in some detail in relation to HCI. In design-oriented research—where research is the area and design the means—the production of new knowledge and the questioning of problem descriptions and other kinds of limitations to the freedom of design are seen as characterizing elements. In research-oriented design—where on the contrary design is the area and research the means—the production of artifacts, and in that process answering to the problems and real-world obstacles that one faces, is the primary objective.

## Author Keywords

Design-oriented Research, Research-oriented Design, Design, Theory

## INTRODUCTION

In my CHI 2003 paper, entitled *Design-oriented Human—Computer Interaction* [1], I tried to do many things, perhaps too many to fit them all in one paper. First of all, I wanted to give the CHI audience a brief introduction to design research, design theory, and design thinking in general, which appears to be an area of knowledge that tends to be largely neglected in the field of HCI. Second, which follows, I sought to point at what I believe to be an obvious problem in contemporary HCI, namely that it does not recognize itself as a design discipline. Third, more than just a surface review of the design field, I wanted to dig deeper into what I called the pragmatic account of design, and propose the frequent use of prototyping in HCI rather as a way of thinking than as a result of thinking taking place somewhere else. This aligns with the argument that sketching is the archetypal activity in all kinds of design work. Fourth and finally, aiming to

trigger a largely missing discussion on the role of design in HCI, I somewhat bluntly proposed the field to start making a distinction between what I see as two different kinds of conducts: *design-oriented research* and *research-oriented design*. With no doubt, this last part of the paper was knowingly somewhat controversial, and it has since the publication of the paper received its share part of critical examinations. While this is indeed a good thing per se—as the purpose was to commence a so far largely missing discussion on the role of design in HCI—I feel that some clarifications on the use (and misuse) of these concepts need to be made. Hence, this paper will briefly look in more detail at these two concepts and what they may signify for HCI research and practice.

## DESIGN AND HUMAN-COMPUTER INTERACTION

Design is often part of HCI when it comes to academic researchers as well as to consultants, applied researchers, and commercial designers. The argument I am making, however, is that both the role design plays and the main contribution that stems from these two conducts differ, but that HCI as a field is most often forgetful about this disparity and tend to regard and treat them as one.

Some voices have been raised against this distinction, as the two conducts may at times be overlapping—and that there within a single project may in fact be a tension between people that see the project as a research project and those that think of it first and foremost as a design project. The argument I am making is that this distinction is neither self-satisfactory nor presents a complete worldview, but that it is rather a kind of basic continuum along which it is possible to pin-point most current HCI projects. It is hence possible to find projects which are situated in between design-oriented research and research-oriented design, seeking to contribute with both knowledge and products. The reason for not describing them in this way in the original paper, however, was that I do not find the center of the continuum to be a very good position for a project, and certainly not one for which to strive. Talking about them as two different conducts has rhetorical value, in that it proposes that one has to make a choice, rather than seeing them just as a range of possible and neutral positions on a continuum. But to see why the center of the continuum might not be the optimal position, we first need to look more closely on these two different conducts.

## A BASIC DISTINCTION

In *design-oriented research*—where research is the area and design the means—the production of new knowledge and the questioning of any initial problem descriptions and other kinds of limitations to the freedom of design should be seen as characterizing elements. In *research-oriented design*—where on the contrary design is the area and research is the means—the production of products, and in that process answering to the problems and real-world obstacles that are faced, is the primary objective.

Some people have misunderstood this basic distinction. These two conducts are *both* conducts in which the researcher and/or designer as a part of their conduct is involved in design; the bringing forth of some artifact not previously there. Studying designers at work is hence neither of the two, as it is all about the conducts of people that are themselves involved in design. While developing new theories, methods, techniques, or even research papers to some extent to could be encompassed in such a broad definition of design, as they too may be seen as artifacts and even products, we may simplify the discussion in this paper by restricting ourselves to talking about the bringing forth of sketches, prototypes, or final products of computational artifacts of some kind.

### Design-oriented Research

First, design-oriented research, what could be seen as the praxis and profession of academic researchers in HCI, should ultimately have *truth*, or the revealing of *new knowledge* of some sort, as its main objective. Especially this is the case if this knowledge is of a kind that would not have been attainable if design—the bringing forth of an artifact (e.g. a research prototype)—had not been a vital part of the research process.

In some ways, this resembles the way natural scientists may only be able to test a theory by first designing the tools or instruments with which to study a proposed phenomena. At times, the design of a new instrument also gives rise to new, wholly unexpected discoveries. But design-oriented research in HCI also differs from natural science in several respects, not least in that the developed artifacts are typically placed in the life-world where they become used by *people*. People have a tendency to use artifacts in ways which were not intended and are not controlled by the designer. Mixing artifacts with people also brings the question of ‘now’ into play. This is to say that while natural scientists develop instruments to be used in a lab setting, abstracting away much of the gore of the real world, the design-oriented HCI researcher’s instruments become used by real people—which inevitably carry with them meanings, presumptions, cultural and societal values and beliefs, and so on. Hence, in this respect design-oriented HCI research is more of a social sciences discipline—such as ethnography and ethnology—than it is related to the natural sciences. Design-oriented HCI research hence inevitably means dealing with issues of people, which entails also dealing with issues of ‘now’: i.e. volitions,

structures of power, structures of gender, meaning, assumptions, presumptions, beliefs, and worldviews, with which a natural scientist usually does not have to deal. Studying an artifact to gain some new knowledge is hence as much a question of understanding people and context—i.e. looking into and trying to grasp ‘now’ and how this now changes when a new artifact is introduced—as it is to develop and study technology.

In design-oriented research, the knowledge that comes from studying the designed artifact in use or from the process of bringing the product into being should be seen as the main contribution—the ‘result’—while the artifact that has been developed becomes more of a means than an end.

Typically, this implies that the artifact that is developed does not need to encompass all services, functions, and level of completeness that a final ‘product’ would need to embrace. The design-oriented researcher hence works with sketches and prototypes of different kinds, depending on what aspects are investigated. Hence, sometimes a brick could be used to sketch a mobile phone; a piece of paper may be used as a screen; and a wholly faked interface may be controlled not by an application but by an experimenter hiding behind a curtain. This implies that the artifact takes on a philosophically interesting role as a kind of middle ground between a thought experiment and a real thing. Many of the sketches and prototypes that researchers develop are too anything but convincing products. They may be wholly or partly fake; if implemented, they may be unstable and lack some expected functionality; as well as they in the area of HCI are often, to put it mildly, modestly aesthetically pleasing. Notwithstanding, they need to be neither of these, as they are not *products* per se—they are *means* to get at knowledge. This is possible because in design-oriented research, it is the knowledge that comes from studying user behavior and user experience that one is after, not the artifact itself. And in this conduct, it is from the knowledge that is generated that one may commence on building new artifacts, even products, not from the sketch or the prototype in itself.

One should also stress that design-oriented research typically includes what Donald Schön talks about as *problem setting* as an important part, i.e. the possibility of exploring possibilities outside of current paradigms; whether these are paradigm of style, technology, or economical boundaries. Design-oriented research hence strives to question the initially recognized limitations of a problem description. It is able to do this because the guarantor of the design effort—its ‘client’ in design language—is the *research project* in which it is situated, it is not a paying third party, nor in fact even one’s end users.

### Research-oriented Design

In contrast, research-oriented design is a term that is believed to better illustrate the relationship that consultants, applied researchers, and designers from industry typically hold in relation to design in HCI.

In Research-oriented design, the artifact is the product or primary outcome; it is regarded as the ‘result’ of their efforts. Obviously—which too is the most common critique to this distinction—this conduct also generates knowledge of various kinds. The argument is neither that this conduct would not generate knowledge; it is rather that it is not what is emphasized. Here the artifact takes on a much clearer and explicit role in what the designers stress as their contribution. Another sign of research-oriented design is the level of completeness and styling of the resulting artifact. Here, the artifacts often come in the shape of final ‘products’, rather than as sketches and prototypes.

Another quite important difference between these conducts is that research-oriented design most often has *problem solving* within some area as a characterizing component, i.e. that this conduct is often carried out within a fixed and known paradigm. This is because in the world of research-oriented design, the designer’s main guarantor, or customer, is typically a third party that puts up restrictions of different kinds and expects certain results (not to mention certain sales). While research-oriented design may relate to, seek influence in, and even contribute to research (i.e. the generation of knowledge) in different ways, it has the production of new artifacts as its main motivation and goal.

#### **WHAT IS THE POINT IN MAKING THIS DISTINCTION?**

The answer to the question of why this distinction is made, finally, is a fairly straightforward three-stage rocket. First, it is made to provoke a discussion to take place within the field of HCI as to what is the role and nature of design in the field. This discussion, as argued in my previously cited paper, has so far been largely missing.

Second, while research-oriented design and design-oriented-research appear to be two different ways in which design shows up in HCI—and likewise, HCI shows up in design work—they are rarely acknowledged as separate types of conduct within the field. The problem with this black boxing, as I see it, is that these different conducts require different kind of quality measures and success criteria. This becomes obvious not least in the reviewing process for conferences like CHI. While design-oriented research projects should be valued according to the quality of the knowledge that has been generated, and success is when knowledge has indeed been created, research-oriented design projects need on the contrary be assessed according to some other scheme than what is typical for CHI, i.e. references and related work, grounding in previous research, statistical excellence, large scale experiments, etc. Here, maybe it is better to turn to the design field to seek influence in how it judges and assesses projects, in fields like industrial design, architecture, perhaps even art, literature, and the movie industry. While perhaps a rather ambitious claim, it might even be most honest to all if design-oriented research and research-oriented design project were to be regarded as different contributions

categories, with their own sessions and reviewing systems. This process has to some extent already started with the introduction of submission categories such as “Design Cases”. In addition, the success criteria for a research-oriented design project typically need to include commercial real-life (while not necessarily true) issues, such as increased sales, branding, good-will, and so on.

Third, one of the main arguments that I want to make with this distinction, eventually, is that the difference between academic research and commercial design needs to be recognized and made explicit, even if both will continue to take place under the cover of HCI. The problem, as I see it, is that academic researchers at times seem to be more interested in conducting research-oriented design than in proper design-oriented research. It seems as if working *with* commercial organizations is far too easily replaced with working *for* them. While design-oriented research should have the larger HCI community as its guarantor—i.e. judging the quality of the work by scientific peer reviewing—it is easy that the guarantor of such an effort rather becomes the commercial organization that may provide one’s funding, and one may find oneself working *for*, and not *with*, these organizations.

It is important to realize that this is not a distinction of value—i.e. that I would believe design-oriented research is in any ways better than research-oriented design. It is rather a suggestion to ease the recognition of different kinds of conducts—with different kinds of ingoing limitations, possibilities, scopes, and motivations—that we find in contemporary HCI. Notwithstanding, I believe it is important that design-oriented research, which is typically at least partly funded by governmental grants, is not transformed into research-oriented design, where the researcher works with design *for*, and not *with*, a commercial organization for research money.

These dissimilarities also explain why it is believed that the center of the continuum between research-oriented design and design-oriented research is not an optimal position for HCI projects. It is so because it is vital that one is clear about what it is one wants to do; what kind of conduct one is involved in; what one’s goals, limitations, and boundaries are; and with what it is one wishes to contribute. It is simply too much to do both good *design*, with a happy client—answering to all the real-world challenges one face—and good *research*, with happy peers, i.e. answering to being true over being real.

#### **REFERENCES**

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