

# *What Design is* matters less than *what Designs are*: Explanations for HCI and Design

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## ABSTRACT

From the literature on design, one learns that there are a number of competing notions of what design is. To some it is an art, to others it is a science, and to others it is a reflective practice. To some it is an inter-discipline and to others it is its own discipline. An alternative to this philosophically charged debate is to focus on *what designs are* as objects instead of *what design is* as an activity. I argue that a design is not a physical object. Rather, a design is a plan or explanation—an **explanation** about why things—forms, interactions, relations, ecologies—are a certain way or why they should best be another way. An *explanation* can be formalized to serve as an object of knowledge in design as a science. An *explanation* can accompany the creation or interpretation of design as an art. An *explanation* can serve as an account of meaning in a discipline of reflective practice. *Explanations* can form the core of study in a progressive research program that combines design and HCI.

## Author Keywords

Design and HCI, *Explanations*, Design Research, Interaction Design, Science and Design, Case Studies.

## INTRODUCTION

For Design traditions and HCI traditions that emphasize methods, it is actually very difficult to distinguish design from HCI in terms of the vocabulary. For example, the terms of art used in a prescriptive method like Beyer and Holtzblatt's *Contextual Design* [2] would seem familiar to designers and yet contextual inquiry is clearly based in HCI traditions, rather than design traditions. The same holds true for many of the design methods inventoried in HCI

textbooks [9]. What then are the substantive differences between design and HCI aside from terms of art that are highly over-loaded with meanings? Surely there are differences of culture, environments, and skill sets, aren't there? Why does Don Norman assert that "The Design profession flourishes because they do things, they create. Usability languishes because good usability is invisible" [11]?

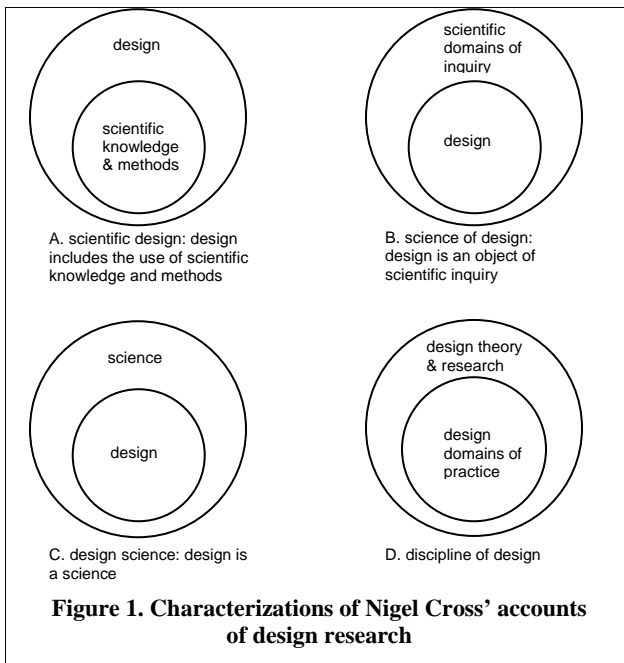
How do you know if you are designer?—You are a designer if you create and understand *designs*, by whatever methods you find effective. Design methods are most effective that yield a universe of effective designs. The proof of the method is in the designs, not the method. The position of this article is that there is more utility in focusing on *what designs are* as objects than *what design is* as an activity.

## DESIGN AS ACTIVITY

Nigel Cross delineates, defines, and sets in historical context the meanings of phrases like "*Scientific Design*", "*Design Science*", and "*Science of Design*" [3]. Figures 1A-1C characterize Cross' definitions of these phrases. Cross' historical account reveals that notions of Science and Design have come in and out of favor over the last Century. He advocates a reflective "*Discipline of Design*" that achieves its own rigor and stands on its own, as characterized in Figure 1D. I quote:

*"Design as a discipline ... can mean design studied on its own terms, and within its own rigorous culture. It can mean a science of design based on reflective practice of design; design as a discipline, but not design as a science. This discipline seeks to develop domain-independent approaches to theory and research in design. The underlying axiom of the discipline is that there are forms of knowledge special to the awareness and ability of a designer, independent of the different professional domains of design practice"* [3, p.54].

Daniel Fallman offers another account of how people have attempted to define design, an account that is equally well informed by historical sources in the design literature [4]. His account—part of a triumverate of positions cited in the call for this workshop—identifies three points of view,



**Figure 1. Characterizations of Nigel Cross' accounts of design research**

namely the *conservative account* which holds that design can be described in terms of science and engineering, the *romantic account* which holds that design owes more to artistic models of creative expression, and the *pragmatic account* which holds that design is a reflective practice in the style of Donald Schön [5,10].

There are obvious correspondences between Cross' notions of Science and Design and Fallman's notion of a conservative account, and also between Cross' notion of a discipline of design and Fallman's notion of a pragmatic account. Fallman's notion of a romantic account is about design as a creative activity; as such, one might not regard it as a research point of view at all, but another endeavor altogether, alike in its merits to research but different in its substance.

### DESIGN AS EXPLANATIONS

Attempting to define design as an activity immediately causes a philosophical discussion—design is art, design is science, design is reflection, design is an inter-discipline, or design is its own discipline. An alternative to this discussion which perhaps unifies its concerns is to stop thinking about design as an activity, but rather to focus on design as an object. *What is a design, not what is design?*

*What is a design, or perhaps wherein is the design?*

- a) The design is in the artifact.
- b) The design is in the feature set of an artifact.
- c) The design is in the set of affordances [8] of an artifact.
- d) The design is in the interactions between a person and an artifact.
- e) The design is in the interactions between a person and an environment.

- f) The design is in the interactions between ecologies of people and environments.
- g) The design is in the reasoning—the ascription or interpretation of meaning, the *plan* or *explanation*—that leads to or accounts for artifacts, features of artifacts, affordances of artifacts, interactions between a person and an artifact, interactions between a person and an environment, or interactions between ecologies of people and environments. To put this another way, a design is a story, often illustrated, about why things—forms, interactions, relations, ecologies—are a certain way or why they should best be another way.

In these short lines, it is hard to adequately derive answer “g”; consider the notion that the design is in the reasoning on grounds of strict utility. Thinking of design as a plan or explanation—an *explanation*—unifies much of the discussion about what design is as an activity. An *explanation* can be formalized to serve as an object of knowledge in design as a science. An *explanation* can accompany the creation or interpretation of art. An *explanation* can serve as an account of meaning in a process of reflective practice. One can engage in practices of constructing, referencing, comparing, sharing, and adapting *explanations*. How do you know if you are a designer? Show me the designs, the *explanations*.

The notation of an *explanation* does not need to be complicated. It can be something as simple as a frame or framework with emphasis on the idea that what is denoted is a descriptive, possibly prescriptive account, not a process. If the *explanation* describes an environment that does not yet exist, it is a *plan*, otherwise it is an *explanation*. Figure 2 shows a fragment of a *plan*-style *explanation* which reflects on Lawrence Lessig's Creative Commons approach to copyright issues on the internet [7].

**Design explanation**  
**Title:** From Creative Commons to Creative Marketplace  
**Target group:** People who find things on the internet that they would like to use and people who create things on the internet.  
**Observation:** Creative Commons implements a system that makes it easy for people to voluntarily notify others of the ways in which they are willing to relax their copyright.  
**Observation:** The popular photo.net site already implements a similar system, and practically no one ever relaxes her or his copyright.  
**Observation:** The Apple iTunes system shows that many people are willing to pay modest amounts for legal use of materials that are otherwise easily acquired illegally without payment.  
**Insight:** It would be better to ask people what would it take as an incentive to share their copyright than it is to ask them in which ways are they willing to give up their copyright without compensation.  
**Concept:** Implement a Creative Marketplace, which is just like Creative Commons, except that it makes it easy for people to notify others of how much compensation they are willing to take in exchange for particular uses of their materials. The system should also make it easy to purchase such rights.  
**Strategy:** A very modest transaction fee could support the Creative Marketplace as a system. The system could be an extension to the Creative Commons system, or it could be an independent competitor.

**Figure 2. A Design Explanation**

What matters most about the example is its quality as a design. It doesn't matter very much which method was used to generate it, either as a plan or an *explanation*. Moreover, one could have used scientific methods, or creative methods, or reflective methods, or what is most likely—a combination of methods. Any method that helps us construct design *explanations* is welcome. Design *explanations* are the canonical form for design methods. That is, many design methods can lead to a single explanation.

How do you know if an *explanation* is a design *explanation*? Again, an *explanation* is a design *explanation* if it explains why things—forms, interactions, relations, ecologies—are a certain way or why they should best be another way. There are different types of design *explanations* that depend on the design values that are being emphasized, such as human-centered, humanity-centered, technology-centered, domain-centered, or marketing-centered values.

As a progressive scientific research program, one can imagine collecting thousands of *explanations* together in a knowledge base, producing classifications, theories, and tools. *Explanations* are like the patterns of Christopher Alexander [1], except that there are thousands of them and they may owe to thousands of designers, rather than a small strictly prescriptive set by a small group of designers. At times, one may wish to regard an *explanation* as an instance of an abstract pattern. For example, the *insight* in Figure 2 may be abstracted under a notion of pattern like “adequate incentive” and the *concept* may be abstracted under a notion of pattern like “making motivations visible” and the strategy may be abstracted under notions of “transaction fees”, “alliances”, or “competition”.

As a counterpoint to scientific methods, creative methods may owe to a view that the world is a very complex place, indivisible into measurable, constituent elements. Nonetheless, creative activity plays a clear role in *explanations*. It is at least sometimes a creative act to develop an insight from an observation, or a concept from an insight and so forth. It is at least sometimes a creative act to develop an interpretation of a creative activity.

As for methods of reflective practice, what is reflection other than explanation and what is design practice other than plan? Indeed, the notion of *explanation* may seem so close to Fallman's characterization of the pragmatic, constructivist, reflective practice point of view that one may be tempted to think it is the same. There is one important difference. Design *explanations* arrived at by means other than scientific methods may still be treated as scientific objects of design knowledge. It is one thing to claim that what you do is not science or has not been treated effectively as a science. It is another thing to claim that

what you do is not possibly a science. Indeed, discussions of reflective practice are already emergent in the literature on software engineering [6].

## CONCLUSION

Is there a unified view of design? By focusing on *what designs are* instead of *what design is*, the activity of design should be understood without controversy as the act of constructing *explanations* for why things are a certain way or why they should best be another way. These *explanations* may prescribe design interventions, in which case they may be called by the special name of *plans*, or they may follow from interventions in which case they are just called *explanations*. In either case their form is the same. They may be constructive objects that specify what is to be or they may be reflective objects that re-construct what is now. It takes creative reasoning skills to construct them and yet they may be treated as mathematically formal objects, objects of design knowledge that may be compared, reused, and form the core of study in a progressive research program.

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