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Propositions of Human-Centeredness; A Philosophy for Design

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Abstract

This paper explores the discourse needed to both institute a Ph.D. in Design and face the challenges of contemporary technologies. Concerning these challenges, it draws on a recent history of paradigmatic design problems, and argues that we are in transition from a culture that is dominated by science (modernism), to one that embraces design as its primary organizing feature (constructivism). To this end, it offers several propositions of an epistemologically informed and, hence, human-centered philosophy for design. Concerning a Ph.D. in Design, the paper opposes modeling this degree on the tradition of scientific research and suggests instead that design scholarship address improvements of design practices. It culminates in a sketch of what a human-centered design discourse might embrace.

Ph.D. dissertations should reflect on and contribute to the practices of the community that grants the degree. The paper demonstrates both and invites Ph.D. scholarship to continue along this path.

Disciplines
Communication | Social and Behavioral Sciences

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Initial Reflection

When we ask what design is or could be, contemplate a Ph.D. in Design, or discuss the future of the designed world, we are, in effect, redesigning design. This observation suggests my first proposition of human-centered design:

Design must continuously redesign its discourse and itself.

It demands that designers apply their design principles also to themselves.

But note: we are doing this in conversation. In this conference, we are in the process of creating a distinctive vocabulary that makes the redesign of design possible. I call the designerly way of languaging a *design discourse*. Designing a Ph.D. builds on the design discourse already in place—the vocabulary by which designers explain their work, coordinate their practices, solve their problems, inspire their students, and convince their stakeholders of the virtues of their work. Beyond talk, design discourse creates the class of objects that we consider *designed* (as opposed to found, naturally grown, or mechanically [re]produced). It routinely pursues particular paradigms and encourages criteria for good design. Mastery of design discourse is what makes the community of designers recognizable.

Discourses, Paradigms and the Realities they Construct

To demonstrate what discourses accomplish and, at the same time, to clarify the level on which we need to discuss a Ph.D. in Design, let me explore three well known discourses: *natural sciences, medicine,* and *engineering.*

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Natural science discourse is a product of the Renaissance. It constructs its object, nature, so as to be researchable in its own terms. Its dominant research paradigm is the experiment. Scientists are committed to offer causal explanations for the data that their experiments generate. Non-causal explanations have no reality. By extricating themselves from the design of scientific experiments and from the phenomena they observe, scientists live in the illusion of "finding" already existing truths and "discovering" laws of nature. This illusion is sustained by restricting scientific attention to invariances at the expense of what could be altered, e.g. by design. Correlatively, scientist cannot conceive that their explanatory preferences could have anything to do with their "findings" and use considerable precautions to prevent scientific observers from affecting their measurements. Scientific research, better "re-search," means repeatedly searching records of the past to assure that results are reproducible. By projecting into the future the constraints found in the past, scientific discourse attempts to conserve its own explanations.

Medical discourse creates a very different reality. It has its origin in the Hippocratic Oath, committing the practitioner to help. It constructs the (human) body, but only to understand and cure its diseases, and repair bodily injuries. Medical practice is fundamentally restorative of normal functioning. The dominant paradigm of this discourse consists in constructing symptomatologies that inform appropriate treatments. Unlike scientific discourse, which excludes the intentions of observers, the remedial intentions of medical practitioners are constitutive of medical explanations. Normalcy is a cultural construct, of course, and it is no surprise that different cultures nourish vastly different medical discourses and conceptions of the body. Western medicine recognizes chemical intervention and surgical reconstruction as paradigmatic treatments. Other discourses know different ones.

Engineering discourse constructs new technologies from existing ones and is guided by efforts to improve functionality and efficiency. It is neither descriptive nor restorative but instructive. It starts with a recognizable problem, analyses it in view of possible technological solutions, instructs installing the most promising one into a social system that, by adjusting to it, tends to produce unanticipated problems to be solved in future iterations. Herbert Simon (1969) describes engineering discourse as the adaptation of the natural world to human goals and outlines its ingredients as:
- A deontic logic (of "should" not "is")
- Search strategies for achieving ends
- A rational decision theory (utility theory)
- Optimizing techniques and satisficing heuristics.

In his proposal, design and engineering discourses are indistinguishable. Both create desirable newness in effect. I see important differences between them, however, and address these below.

The point of these examples is that *languaging matters* enormously. Discourses construct vastly different realities into which the ideas of a discourse are inscribed and in turn become available for inquiry and elaboration. E.g., the concept of function, an explanation of how parts contribute to the maintenance of their whole, is real in medicine, but not in physics. Different discourses not only construct *incommensurable realities*, their pursuit of different *paradigms* yields different kinds of knowledge: Experiments are not treatments, and neither are technical inventions. Finally, discourses create their own *communities of experts* whose members may not be able to communicate across discourses.

As is now apparent, natural science discourse creates a reality that precludes design. It would be a grave mistake, therefore, for designers to model their Ph.D. on what science does best: scientific research. Science inquires into what is, design into what could be. Designers may learn more from the practical

and a-theoretical medical discourse. Medical practitioners engage in problem solving, systematic research, integration of different approaches (interdisciplinarity), and technologies of intervention, much as designers do. Yet, medical discourse has managed in less than two centuries to develop sophisticated technical vocabularies, institutionalized practices, and educational programs that are widely respected. Unlike design, medicine restores bodily function; it doesn't create new ones. The discourse of engineering is mono-logical, consistent with the idea of a mechanism that serves particular functions. When people do enter engineering discourse, e.g. through ergonomics, they have to be described in mechanistic terms.

Whether through muddleheadedness, seeking to impress others with fashionable paradigms, or by default (especially lacking awareness of alternative paradigms and of their own languaging), I contend that designers allow their discourse to become colonized by the commercialism of marketing, the conservatism of science, the individualism of art, and the mechanism of engineering. Current distinctions of design practices indicate considerable diversity: industrial design; interior and exterior architecture; graphic, information and media design; fashion design; urban planning; and project design and management. They share, however, ways of talking and justifying what they do. A design discourse is a designer's most precious intellectual investment. It is also the domain of Ph.D. scholarship. To guide design, it has to be aligned with the very world that design is creating. Let me examine the space that design occupies today.

A Trajectory of Artificiality

Recently, Philip Agre (2000) elaborated on the new space for design. He observed that design is no longer limited to professionals, that technology has evolved to a point at which design has become a way of life, that the old thinking of design as the creation of gadgets has given way to thinking of design as socially embedded. Indeed, after a century of struggle among competing design/art schools, design has now been sent on an irreversible trajectory of design problems (Krippendorff, 1997), a supercession of paradigms or guiding exemplars. Consider these as steps taken:
1. *Products*—during the industrial era
2. *Goods, information, and identities*—since the beginning of consumerism, (the 50s)
3. *Interfaces*—since the personal computer, (the 70s or 80s)
4. *Multi-user networks*—since the WWW, (the 90s)
5. *Projects*—in management since WWII, but in design only recently
6. *Discourses*—in philosophy since Wittgenstein (1953), Rorty (1989), in design see Krippendorff (1995).

This trajectory manifests a gradual increase of human/social considerations and amounts to a radical departure from a scientific culture to what we might call a design culture. Let me follow this trajectory in the following.

Some Propositions of Human-centered Design

The paradigm of designing functional *products* for mass-production, an outgrowth of industrialization, died with Ulm, but stayed within engineering with its concern for production and functional use.

Human-centeredness arose in the paradigm shift from products to *goods, information, identities*, appearances, fashions, brands, etc. Goods reside in their passing through markets, information in the reading of texts or images, identities in how people see themselves through their artifacts, etc. It dawned on the designers of such intangibles that their products were social practices, symbols, and preferences, not things, and that they are designed for buyers, consumers or audiences, not users. Obviously:

We do not respond to the physical qualities of things, but to what they mean to us.

This epistemological axiom distinguishes clearly between human-centered design, a concern for how individuals see, interpret and live with artifacts, and object-centered design, which ignores human qualities in favor of objective criteria (e.g. functionality, costs, effort, durability, even formal aesthetics), all measurable without human involvement. It also distinguishes between design and engineering. In a design discourse, meaning is central. In engineering it has no place. This axiom is fundamental to product semantics (Krippendorff, 1989).

Personal computing ushered in the next paradigm: *interfaces*. Language-likeness, interactivity, submersion experiences, and self-instructability made interfaces no longer explainable in psychological or socio-semiotic terms and rendered the language of functionalism, consumer preferences and aesthetic appeals obsolete. Interfaces are processes and they dissolved artifacts into interaction sequences. Product semantics offered dynamic accounts of how individuals coped with artifacts, not only computational ones (Krippendorff, 1990). It taught us that

We re-cognize artifacts within our sensory motor coordinations.

Artifacts do not exist outside human involvement. They are constructed and re-cognized by us. Agre (2000) observed much the same when he claims "We can best see what a thing is when it's changing,"— I would add when we can make it change—"and now everything is changing."

Undoubtedly, languaging is our most important form of coordination. We coordinate our perceptual categories in speaking with one another. We construct our larger world in conversations. Even design cannot succeed without communication among designers and with stakeholders. Hence:

Coordinations acquire social significance in narratives and dialogue.
Artifacts are languaged into being.

Interfaces have many revolutionary aspects. Reconfigurability, for example, one of its outstanding features, grants users the ability to (re)design their own world. Designing (re)design(ability) into artifacts has considerable cultural implications. It propagates design, thus blurring the boundary between designers and users. And it delegates design, saving the designer the trouble of working out details:

Inscribing (re)design(ability) into technology amplifies design
in a culture that increasingly understands itself as co-constructable and design-driven.

During the industrial era, users who failed to adapt to designers/industries' conceptions were thought to "resist progress." But, as Agre (2000) observes, people resist only imposed changes. They are happy to change their lives but on own terms. The opportunity to design, play, and invent rules rather than follow others' instructions *enables* users. (Re)design(ability) turns out to be the most important intrinsic motivation for using any technology. I claim that:

Design is constitutionally human and an intrinsically motivating activity.

Where design has virtue and is made widely available, designers can at their best be a step ahead of everyone else.

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(Re)design(ability)—technologically enabled by open architectures—gave rise to another more collaborative paradigm: *multi-user networks*. In such networks users build their own worlds while in contact with each other. Viable networks require a minimum number of participants. They cannot, however, be controlled from their outside. Chat-rooms, MUDs, news groups and various "collaboratoria" either organize themselves or cease to exist. They are designed by many, including hackers, Internet buffs, computer programmers with crazy ideas, people at the edge of technology, but also commercial profiteers, each entering their own conceptions of community into the network. Agre (2000) suggests, albeit in other words:

Technologies fuel and amplify communities or fail altogether.

Technologies that discourage cooperation among users cannot survive in the long run. Technologies that provide mere technological solutions of social problems cause instabilities. Technologies that expand community invite new forms of living.

Unlike networks, *projects* (my sixth paradigm) are guided by shared visions—putting humans on the moon, redesigning the US healthcare system, developing a Ph.D. program. Project designers plant seeds, but cannot control what emerges from them. I submit, design has always been a project. No design has ever been realized without others' cooperation. As a project:

Design succeeds only when it inspires and sustains sufficiently large networks of stakeholders.

Engineering creates instructions (drawings). Human-centered design has to be inspiring.

Thus, our trajectory has guided us to *a culture that recognizes its reality as made rather than found*. It realizes its own variability, reflects upon its possible forms of living, and understands itself as redesignable. The modernist notion of a science-based culture has given way to a culture in which design is no longer a privilege but has penetrated nearly every area of social life. Each paradigm shift en route to this design culture now seems so obvious that one wonders why we couldn't see design that way before.

Human-centered Design Discourse

Human-centered design acknowledges that technologies live in stakeholder communities, not separate from them. Any "search of the present for paths to desirable futures"—design—must be embedded in the very communities that claim a stake in this future. Design discourse should improve, test, and promote these design-specific method(ologie)s:

- **Systematic ways of narrating imaginable forms of living.** Futures are articulated by poets, science-fiction writers, and dreamers. Designers may well be inspired by these. But to clarify the space in which they operate, designers will have to rearticulate them for their own purposes.
- **The art of making the imaginable realizable.** Realizability is not an attribute of plans or ideas. It is an individual's ability to see what could be done with them and to communicate this to others. This includes making presentations, translating proposals from one medium to another, elaborating, detailing, or extending. Designers who cannot delegate design in this sense, inevitably fail.
- **A rhetoric that inspires networks of stakeholders that are large enough to move a design forward.** Design is advocacy. It is never better than the rhetorical strengths of its analyses, empirical tests, and endorsements. However, the most significant aim of this rhetoric is to recruit needed stakeholders, encourage suitable organizational forms, and fuel continued involvement.

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- **A critical undiscipline**. For design, past precedence offers no justification of the forms of living it inspires to. Science, by contrast, justifies its generalizations by reference to past constraints. Facing competing truths, design discourse must always question what other discourses claim impossible. It has to resist being "disciplined," distrust alien paradigms, and remain critical of unwarranted assumptions. The constraint that designers should accept on moral and practical grounds is the necessity of involving other stakeholders in the process.
- **Second-order knowledge**. Human communication and the design for and with others call for an understanding of other stakeholders' understanding (of design, technology, or still others). This second-order understanding signals an epistemological break from the first-order understanding that science, medicine, and engineering provides. Second-order understanding assures design its social relevance and opens the possibility of moral rather than merely efficient actions.
- **Virtue and morality**. Design is not rational, consensual, democratic, nor principled. It succeeds only in the very politics it generates. It may be inspired by visions but must prove itself viable. At any step it takes, design needs a minimum number of stakeholders to succeed. Technologies need not be accessible to everyone and may develop in unintended ways, precisely because designers always are mere stakeholders in their own designs, not in charge. Imaginability concerns individuals. But the wisdom that complex stakeholder networks embody easily escapes individual designers' understanding. A design discourse that delegates decisions on the virtues of a design to stakeholder networks goes beyond individual understanding. It is morally responsive.

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Biographical Note

Klaus Krippendorff is a Professor of Communication at the University of Pennsylvania's Annenberg School for Communication. He graduated in design from the Hochschule für Gestaltung, Ulm, and holds a Ph.D. in Communication from the University of Illinois, Urbana. He is elected Fellow of AAAS, NIAS, ICA, and the Society for the Science of Design (Japan). He is a former president of the International Communication Association.

He has authored several books: *Content Analysis* (translated into four languages), *Information Theory, A Dictionary of Cybernetics*; and wrote numerous book chapters and journal articles, ranging from communication theory, methodology in the social sciences, cybernetic epistemology, to critical studies (see www.asc.upenn.edu/usr/krippendorff).

He is working product semantics into a constructivist epistemology for design, consults with industry, and has lead workshops on this subject in the US, The Netherlands, Finland, India, Taiwan, and Japan. He recently edited *Design in the Age of Information* (NSF).