Strategies of Inquiry in Design Research

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One of the most surprising developments of the past decade is the emergence of design as a core intellectual property not only of corporations but also of nations. There is recognition in many countries that design is a key source of innovation for economic development as well as social improvement. One consequence is that design in a growing number of countries has a central place in education for all students, not just those who are preparing for professional careers in the various design disciplines. Indeed, many countries have developed or are developing national policies to strengthen design education, design research, and the integration of design thinking into many areas of national life.

Important as this development is, we should not take it for granted and continue business as usual. To sustain the influence of design and ensure its success there will have to be a new level of organization and collaboration in the design community. We must strengthen our individual institutions through innovative programs and imaginative explorations of new design thinking. We must also, as Yrjö Sotamaa has argued,[1] work together to share our knowledge and research results, develop the agenda of design research, and improve the quality of research.[2] In short,

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[1] Yrjö Sotamaa, opening remarks at the founding meeting of the Network of Leading Design Research and Innovation Centers. September 21, 2005. University of Art and Design. Helsinki, Finland.

[2] The first meeting to discuss the issue of quality in design research was held by the Design Research Society in July 2005. The symposium, called "Rising Stars: Improving the Quality of Design Research," included papers by David Durling, Ken Friedman,

we must, as he says, "find more effective ways to increase the impact of design and design research on industry and society."

This is certainly the goal of the Design Research Society, and it is also the goal of the various design science societies in Asian countries. Because of the need for greater collaboration in strengthening design and expanding the agenda of inquiry, we can expect the beginning of a consolidation of these societies in the near future. These societies provide the public forum for the presentation of design research, and they also serve to strengthen the identity of design research and support the growing interdisciplinary network of design researchers. They provide the stable background against which we may view the network of topical and somewhat ephemeral national and international design conferences that take place each year on a wide variety of themes.

Arguably, however, there is a place for another kind of organization, an organization of institutions, which are centers of design research and innovation. The broad goal of such an organization may be similar to the goal of the Design Research Society and the design science societies of Asia, but the program of the organization would be different. It would focus on sharing ideas and practices among the institutions, exploring formal and informal collaboration in research ventures, and discussing problems of quality. Indeed, Professor Sotamaa has suggested several elements of the program, and we will discuss these suggestions and other ideas as we assess the viability of the organization.

My contribution to discussion of the new organization is a brief philosophic perspective on the strategies of inquiry in design research. Other presentations will

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Michael Biggs, Linda Drew, Bruce Brown, and Richard Buchanan. The papers are available at the DRS web site.

focus on specific national and institutional strategies, institutional experiences, the conduct of collaborative projects, and various issues of common concern. I hope that my presentation will provide a framework for what will follow, suggesting the themes that may serve to distinguish our different approaches to organized research.

One of the fundamental questions that should concern us is what distinguishes a leading center of design research and innovation? It is not the quantity of research or the volume of funding or the number of faculty members and students or the number of degrees granted to emerging design researchers. These may be measures of one or another characteristic of a center of design research, and the measures may be useful for governmental funding agencies and national research assessment exercises such as that in the United Kingdom. But they do not tell us about the vision of a leading center or its intellectual character, nor do they tell us about its place in the development of the field of design as a whole. They do not tell us about the life of a center of design thinking. For this, we must turn to the strategies of inquiry in design research and the historical development of the field in practice and theory.

As in any inquiry—and particularly at the founding of a new organization—it is useful to begin with some working definitions that may, initially at least, provide common ground for later discussion. One is a definition of research, and I offer this for our beginning: *Research is inquiry in the search for knowledge and understanding.* It is important to include the term "understanding" because we should resist the tendency to reduce knowledge to a mere collection of facts. Knowledge should lead to understanding, and understanding may lead to principled action. The understanding of principles is the goal of research.

In turn, I offer this definition of inquiry, derived from John Dewey's theory of inquiry.[3] *Inquiry is the transformation of an indeterminate situation into a unified whole through the controlled and directed determination of its constituent parts and relations.* The unsettled matters that are the subject of research undergo resolution through various methods of investigation, and the outcome is a unified explanation of the phenomena that we seek to understand.

With slight modification, this definition of inquiry suggests a definition of design itself, revealing the sense in which design practice is a form of inquiry and experimental research, investigating what is possible in the human-made world in the service of human beings. *Design is the transformation of an indeterminate situation into a unified whole through the controlled and directed determination of its constituent parts and relations.* All designers, whatever their specialization, begin with a given determinate situation, discover what is unresolved and indeterminate in that situation requiring new design thinking, and then seek to resolve the uncertainty through creative exploration of the parts and the relations of the parts, leading to a solution that brings unity to what was indeterminate. I know of no other definition of design that is better in explaining the essence of the creative work of the designer across all of the forms of professional practice.

From these definitions, we can move on to the strategies of inquiry. For some time I have been engaged in a study of design methodology and the methods of design research as they have unfolded over the course of the nineteenth and twentieth centuries. This work has led me to identify three major strategies of inquiry that may help us understand the diversity of our field. I believe these strategies, in broad form,

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[3] John Dewey, **Logic: The Theory of Inquiry** (New York: Holt, Rinehart, and Winston, 1938). I believe this book, in the long run, will be as important for the development of design thinking as Dewey's already well-known **Art As Experience**.

can serve our present purpose in characterizing leading centers of design thinking. A center of design thinking tends to focus on one or another of these strategies, gaining distinction by the quality of its exploration. Individual researchers may set their own strategy and agenda, but a center of design thinking reflects a commonly held strategy, explored in individual variations. The focus gives coherence to research and enhances the impact and significance of research.

The three strategies that I have identified are:

Dialectic

Inquiry — Rhetoric
— Poetics or Productive Science

Design Science
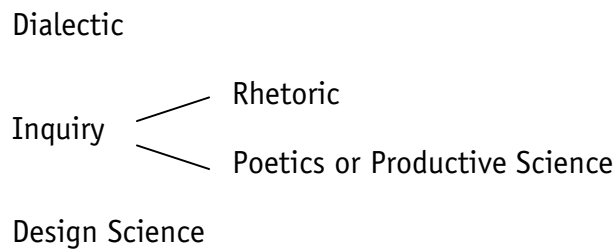
The middle strategy, as I have indicated, may be divided into two related but different forms of inquiry. I will briefly characterize each of the strategies to suggest the direction of inquiry, recognizing that they require much fuller elaboration than the current occasion allows. I hope that even in brief form they will help us to understand the presentations that will follow.

Dialectical inquiry is the search for unifying ideas through an exploration of the opinions of experts and ordinary people and the contradictions of daily experience. It is a common form of inquiry in many countries of Asia, the Middle East, Africa, South America, and parts of Europe. It is less common in the United States and the United Kingdom, but it does appear in those countries in a variety of forms. Dialectical inquiry emerges in several streams.

- Idealist dialectic—illustrated in Hegelian phenomenology as well as various Asian spiritual philosophies

- Materialist dialectic—illustrated in variations of Marxism and Marxist phenomenology

- Skeptical dialectic—illustrated in pragmatism and the phenomenology of practical social and political process

Dialectical inquiry in design research often focuses on culture and the differences and similarities of cultures. Values and political action are common subjects of investigation. History, too, is a common subject, since history often reveals the unfolding of ideas and contradictions in a coherent process of evolution and revolution, though history also appears in other forms of inquiry.

Inquiry, in the precise sense, is the exploration of human experience through analysis and synthetic or creative action. Inquiry emphasizes the human power to invent and act as well as the natural, social, and cultural environment of action. Because of these two aspects, inquiry takes two different but closely related forms. One form is **Rhetorical Inquiry**, focusing on the creative or inventive power of the designer and the process of social change. It often involves a kind of practical, "operational" thinking. The other form is **Poetics** or **Productive Science** of the human-made world, focusing on the function, form, materials, and manner, in which products are designed, produced, distributed, and evolve in society. Rhetoric and Poetics have long been associated in the history of the arts, and it should come as no surprise that they have reemerged as strategies of inquiry in design research.

Finally, **Design Science** is the search for basic underlying mechanisms in the workings of the mind and the material world. By investigating such mechanisms through careful research, one hopes to explain the complexities of the design process and the workings of design in ordinary life. This strategy often focuses on the logic of decision-making, illustrated in the work of Herbert Simon. Following Simon, design

science is also known as the "sciences of the artificial" and is often associated with cognitive psychology, cognitive science, or some form of positivist or neo-positivist philosophy. It is also associated with the design methods movement of the 1970s, though later developments of the design methods movement have reintroduced variations of rhetorical inquiry and productive science as well as dialectical inquiry—usually without conscious recognition.

To illustrate these strategies in concrete form, we may consider three of the most influential design schools and, at the same time, three of the most important centers of design research and design thinking in the twentieth century: the Bauhaus, the New Bauhaus, and the Hochschule für Gestaltung (HfG) Ulm. Under the influence of its founder, Walter Gropius, the Bauhaus sought to develop a "modern architectonic art" grounded in the character of the artist-designer and in the disciplines of making and production. In the context of our present discussion, it is clear that Gropius intended to pursue a strategy of inquiry, focused on explorations of human experience rather than on a dialectic of ideas or a materialist or neo-positivist design science.[4] Gropius says, "Our guiding principle was that design is neither an intellectual nor a material affair, but simply an integral part of the stuff of life, necessary for everyone in a civilized society."[5] However, neither rhetorical inquiry nor poetic inquiry were fully developed at the Bauhaus, and by the time of Hannes Meyer, director of the school in its final period, a strategy of dialectical materialism had replaced the strategy of inquiry with which the school began.

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[4] See Richard Buchanan, "Rhetoric, Humanism, and Design," in Discovering Design: Explorations in Design Studies, ed. by R. Buchanan and V. Margolin (Chicago: The University of Chicago Press, 1995), p. 35ff.
[5] Walter Gropius, "My Conception of the Bauhaus Idea," Scope of Total Architecture (New York: Collier Books, 1962), p. 20.

Moholy-Nagy continued to pursue the strategy of inquiry at the New Bauhaus, established in Chicago in 1937. John Dewey's **Art As Experience** was a core reading and an important source of inspiration, presenting a more formal development of inquiry in the context of artistic creation. In addition, Moholy recruited philosopher Charles Morris to teach a course in intellectual integration, using the uncorrected galley proof of his **Foundations of the Theory of Signs** as a background reading in theory. The combination of readings from Dewey, representing a strategy of poetic inquiry, and Morris, representing a semiotic version of rhetorical inquiry, suggest the direction in which the New Bauhaus would have developed if Moholy had lived. Unfortunately, his premature death obscures the further development of communication and poetics that would have been possible at the New Bauhaus with the stronger intellectual foundations that were now being joined to design thinking.

Finally, the story of HfG Ulm provides another illustration of the relations of different strategies of inquiry in design. Max Bill founded HfG Ulm in 1953, planning to continue the strategies and principles of the Bauhaus. He soon found, however, that many of the staff wanted to pursue another course. That course would focus on new methods related to what the staff considered to be the needs of industry. Ironically, however, there were two conflicting strategies emerging at HfG Ulm around two visions of the needs of industry. One was a strategy of dialectical inquiry, expressed in the critical theory of the Frankfurt School of social theorists. The other was a strategy of design science, expressed philosophically in the neo-positivism of the Vienna Circle. As Tomás Maldonaldo, the successor of Max Bill, indicated, the two visions were contradictory. "Although my own cultural orientation was strongly marked at that time by Neopositivism (I was eagerly reading Carnap, Neurath, Schlick, Morris, Wittgenstein, Reichenback, etc.), the presence of Adorno in Frankfurt represented for

me, as it were, a contradictory intellectual stimulation."[6] Indeed, the contradictions became conflicts among the staff of HfG Ulm, ultimately contributing to the breakup of the school.

We should not conclude from these illustrations that the strategies of inquiry in design and design research are defined by their development at these important schools. One may pursue any of the strategies of inquiry without following their particular expression at the Bauhaus, the New Bauhaus, or HfG Ulm. Indeed, the rise of design in the twentieth century and its continued development in the twenty-first century remain vital precisely because our research, theory and practice take shape around different uses of the strategies of inquiry.

What we can conclude is that the basic strategies of inquiry persist in the design community, undergoing subtle transformations that become intelligible when we recognize how important the strategies are in our work and in the work of leading centers of design research and design thinking. Today, for example, many in the design community recognize the strategy of design science. But the other strategies also are important, even if they are not as familiar or commonly recognized in the literature of our field.

I believe that we will see, in the following presentations, the subtle working of the different strategies of inquiry. By understanding the alternative strategies, we may begin to see the different contributions that our institutions make to the development of design without dismissing some because they pursue an unfamiliar line of inquiry. I suggest that we look to new developments of rhetorical inquiry and poetic or productive science in many institutions. I suggest that we look carefully at the

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[6] Tomás Maldonado, "Looking Back at Ulm," Ulm Design: The Morality of Objects, ed. Herbert Lindinger (Cambridge: MIT Press, 1990), p. 223.

significant difference between poetic or productive science and what we refer to as design science. Finally, I suggest that we pay close attention to the development of design research in Asian countries, where design science is often the explicit agenda of inquiry but where dialectical inquiry provides a deeper, implicit agenda of investigation. Without more subtlety and sophistication in understanding design inquiry, we will miss the most important developments of our field and fail to take advantage of new learning in the collaborations among our institutions.

In the past, our schools of design were distinguished primarily by the diversity and quality of education for professional practice at the undergraduate and masters levels. Today, our schools are distinguished not only by the quality of undergraduate education but by the quality of research efforts at the masters and doctoral levels and by the research accomplishments of faculty members working individually or collectively in organized programs. In the future, we hope to see the field of design, itself, distinguished more effectively by its vision and accomplishments. Understanding the strategies of inquiry for design research will contribute to this goal.