

Defining design: a new perspective to help specify the field

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Abstract

Many of the problems of theory within design come from the lack of a clear definition of the field. While we know much about design, we lack a model into which to put it. This paper argues that this definitional problem is symptomatic of larger cultural issues reflected in design. It proposes to assess what design can reasonably do, and to build a perspective which is specifically designed to address design's needs.

This is the first of two articles. the second article outlines the theory and application.

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Introduction:-1

Does design have a perspective of its own?

Does design research have "its own epistemological and methodological originality?" How is it possible to talk about the problem of research while leaving "the core of the problem untouched?"* Both of these questions reflect the lack of a core theory of design. Professions have their **own** practical discourses, which define, govern, and legitimate their activities. disciplines back these with theoretical discourses. The lack of a theory is not a problem for theorists alone; It is also a problem for practitioners, who have difficulty in formulating, asserting and maintaining standards with respect to their goals and procedures. Beneath lies the larger question of whether it is possible in principle for design to function as a profession or as a discipline.

* This essay was written in response to a call for papers asking whether design research has its own "epistemological and methodological originality." The call, an outgrowth of the conference "On Guru, no Method" held in the University of of Art and Design, Helsinki, was published in Design Issues, Vol. 13:1, Spring, 1997. p.95

Perspective as filter

Behind the notion of discourse is "perspective:" "[Perspectives] sensitize the individual to parts of physical reality an, they desensitize the individual to other other parts and they help the individual make sense of the physical reality to which there is a sensitization "* To contnue, "...[A perspective] makes certain assumptions, that it sensitizes and desensitizes the investigator, that it has a certain conceptual framework, and that it can never reveal the whole truly about the human being.** Perspectives are groundwork, more general and less rigid and formal than theories. We often identify with them, as sets of attitudes we have, rather than the more game like specifications of theories. If we ask ourselves whether we think designers have a paticular persepective, and the answer is yes, then, the long run, design cannot survive without discourses of its own, particularly as new technologies de-skill the traditional craft functions. Thus the question of whether design has its own "things that it knows" and "ways of finding them out," becomes the question of whether design can define its perspectival identity.

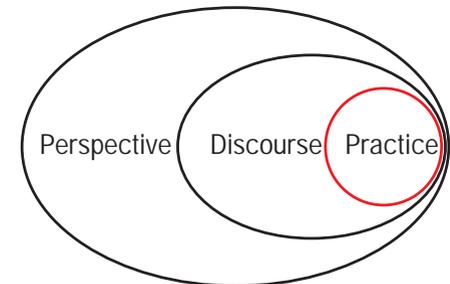


figure 1

Building a groundwork perspective for design

Defining design in terms of theoretical perspective and practice will require explicating the larger set of problems which design wishes to address, so the "first" problem for design theory is to build a larger theory or shell of the requirements which design is to fulfill. Within that shell, design can operate – identify a reasonable set of expectations for itself in terms of goals and the methods by which those goals can be sought and performance measured. Designers have compounded the lack of such a shell in two ways: by the use of terms which have the semblance of meaning but lack analytical structure; and by syncretism: the cobbling together of incommensurable outside theories and methods. Therefore, I will avoid design terminology to look at design in these elementary terms.

* Charon, Joel M. Symbolic Interactionism: An Introduction, an Interpretation, An Integration. Upper Saddle River, New jersey; Prentice Hall, 1995. P. 3

** Charon, 1995, p. 14

Introduction-2

Theoretical argument of the paper

There are four major assertions:

1. Design is caught in an ongoing cultural struggle between Enlightenment rationalism and Romantic expressionism
 - A. In an informal way, designers define their work in terms of enlightenment rationality: predictable outcomes and perfectibility.
 - B. In opposition to enlightenment rationalism, romantic thought stresses the individual over the system, and struggle over coordination. The current popularity of antigovernment, anti planning entrepreneurial free market thinking expresses this cultural opposition.
2. In order for design to function competently, it will need to find a perspectival base outside of the romantic rationalist opposition. The mutual antipathy of these positions reflects a common lack of credibility. Neither looks credible in modern societies. Modern societies are far too complex and open ended.
3. There are other more appropriate models. A developmental or evolutionary model of culture and social structure can provide the base upon which a theory of design with claims to practical competence can be erected.
4. Within evolutionary social theory, the creation and use of symbol systems is key to understanding the cultural and social structure and change. I would propose the sociological theory of "symbolic interactionism" as an adequate and appropriate perspective within which design can be understood and practiced.

Unfortunately, the explication of such a theory is outside of what can be done within this article. The first goal, which I will pursue here, is to build the foundations of a naturalist, pragmatic view of human development which can be applied to design issues.



Design and Discipline 1:
Discipline, knowledge and symbol

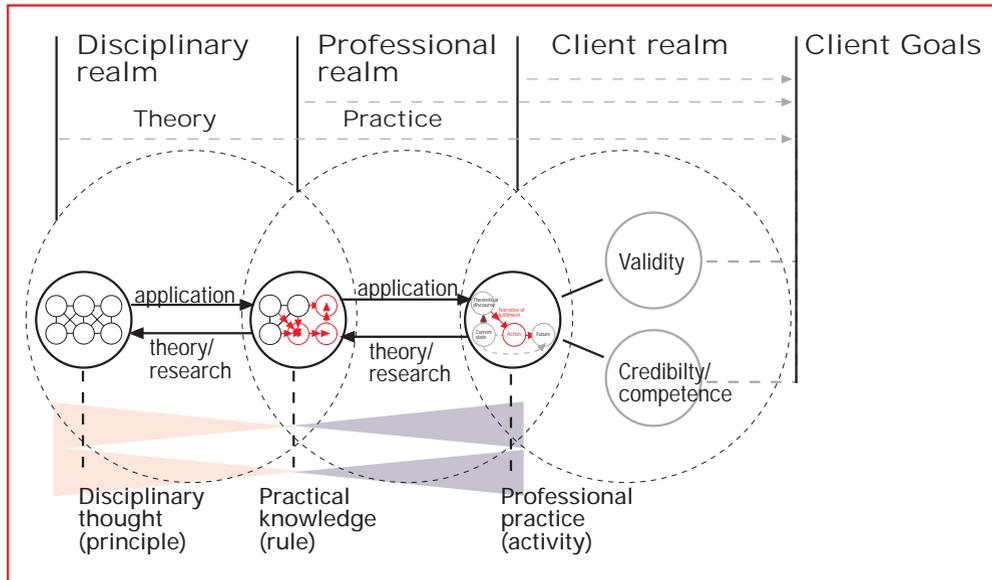


figure 2

A functioning discipline relates theoretical doctrines to practical goals in the world^{*} through competent practice. Disciplines often begin as professional practice in client realms supported first by craft rules. They may develop professional knowledge and procedures which symptomatize the client realm and order the practical activities which are its interface to that realm. Knowledge transforms events in the client world into the professional language of symptoms, and the craft of activity into professional practice. Finally, disciplinary thought rationalizes and grounds the knowledge of practice within an abstract frame. Thus, for example, if I have a fever that puts me to bed, a physician examines that fever, interprets it as "symptomatic" of a particular illness and prescribes an appropriate medication. Symbols enable us to see "symptoms:" to make links that are not directly intuitive. It is only through the symbolic links of knowledge that the notion of putting white things in my mouth to cure itchy eyes makes sense, though once it becomes routine, it becomes intuitive.

* There are number of references to the "concrete world." In general terms, "concrete world" has a family resemblance to the Heideggerian notion of "life world," the professional notion of the "lay" world, and to the symbolic interactionist notion of "the situation as it exists." It is not at all the same thing as "physical:" it could be a pear or a computer program. It refers to the world as we experience it before we analyze it. In analytic philosophy, this is sometimes referred to as the terms which are best understood in "ostension;" for example, if I have a pear in one hand and a definition of a pear in the other, I will use the pear in my hand to judge the definition. However much we theorize, we live in the concrete world of sensory knowledge, and we design "things" to be experienced in the concrete

Design and Discipline 2:

Profession, discipline, practice, and outcome

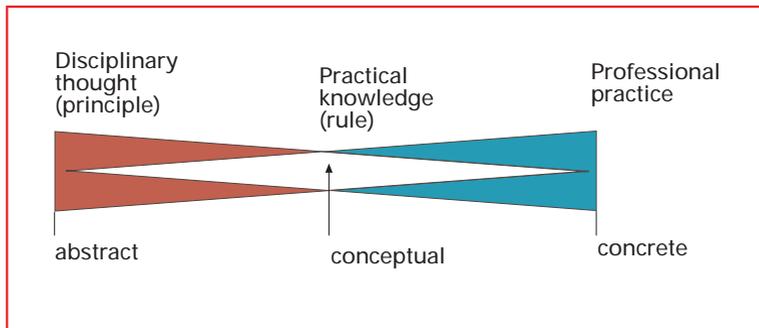


figure 3

A profession develops as a dedication to solving difficult problems in lay practice, developing its own strategies or methods. It develops experiential knowledge on the basis of its work,* but the greater the experience and the more difficult the problems, the more often professional practice is itself stymied, and the more it needs to carry on its own research and develop its own disciplinary knowledge. In itself, theory may appear as abstract, but it provides principles, which are operationalized in rules of procedure. It is joined to the concrete world by an often complex structure of conceptual terms which combine and connect components of the abstract and the concrete.

*Within speech theory, this position goes under the name "Rhetoric as epistemic." See Scott, Robert L. Narrative Theory and Communication research, in Quarterly journal of Speech, Vol. 70: May, 1984, p. 197-221

Disciplines and the rhetoric of practice

We often think of disciplines in terms of the theories which come to organize them (medicine as a body of knowledge), and professions in terms of their rules of practice (legal procedures and ethics), moving from left to right in figure 2. But they develop in the other direction, from concrete to abstract, vernacular activity to craft, profession and discipline, and their legitimacy finally rests on whether they can function in the concrete client world (That client may be an individual, an organization, subculture, or the society as a whole). The professional boundary is contextual, between the discourses of the professional practice and those of the outside world. The professional consultation represents an intervention in the client world based on the intersection of professional and lay contexts. Distinct professional contexts and goals are represented in the knowledge and rules of conduct of the profession. Ethics are integral to a profession, defining not what is moral, but the conduct that enables that profession to function coherently.



Design and Discipline 3: Disciplines and the rhetoric of practice

Professional practice is a rhetorical intervention. There is, in the client world, a present state of affairs and a goal state of affairs. Professional practice intervenes to interpret the client goal, understand its motivation or interest, redirect it if needed, and project action through a theoretical discourse and its application in a narrative strategy or scenario for transformation from the current state of affairs to the goal state. The process may be partial, or it may not be obvious. Thus, designers may produce merely strategies or plans, or may also execute those plans to prototypes or end products – software design is close to the point where the two are the same. The consultation process may be so integrated into the normal development process that one is not aware of it, but we can “find” design by asking when it becomes necessary, and for what.

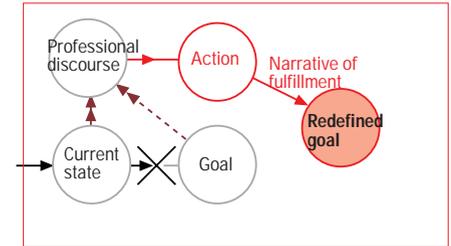


figure 4

Design and Discipline 3: Historico-genetic description of design

Design is both ancient and modern. Stone tool makers were designers if they thought about how they crafted those tools and set about to improve them. Within industrial and technoculture, that process of making and using is mediated and redirected by socio-technological systems which create designers, producers and consumers through the firm and economy. *Design appears in order to represent the needs and uses that are not otherwise self-evident or intuitive.* Designers are expected not to merely reproduce traditional forms or produce decorative ones, but to act rationally: analyze use, develop performance goals and criteria, and apply them, and increasingly to innovate. Design developed historically out of field specific or engineering issues and through the enlargement of the design problematic from the object itself to the situation of use. Design intervenes in the product development process of product or communication, to redefine the product or action sequence that achieves product goals. The job of building a more functional or reliable photocopier is essentially an engineering problem, but once we ask who is going to use it, what they are going to copy, or whether, given a choice, it should be reliable, easily repaired, or cheaply replaced, etc., we have design decisions.

The Nature of Design

Design-1: engineering

The three types of design

We can discern three distinct types of design: "design-1," technical design or enhanced engineering, "design-2," concerned with the symbolic aspects of products and communications, and "design-3," concerned with large scale social systems and indirect effects. I will argue that the problems of design-1 are not those of self transformation and do not present the problems for which a new theory of design is needed. Design-3 as we understand it, is neither feasible nor desirable; it needs to be reconstructed. Design-2 is the most appropriate level upon which to build a theory of design; it is both feasible and necessary. It concerns the construction of symbolic relations and the support of congruent user interpretation and only thereafter with criticism. With such a structure, we can build a credible, coherent model of design.

Design-1 = ergonomics

Design-2 = communication

Design-3 = Large scale planning

Design-1: engineering

The Theory of design-1

Here are some library titles under the term "design": "Design and Analysis in Educational Research," "Design of Algorithms," "Design and analysis of clinical Experiments." In these cases, the term "design" refers not to some special notion of design, but to the operationalization of theories in particular fields. We do not need a theory of design per se to cover them. Similarly in the notion of design that emerges in ergonomic regions, we have relatively unambiguous ways of talking about functionality. We can discuss whether a door handle is properly shaped or placed and whether the appropriateness is ergotic, or culturally determined. We may not be able to achieve some set goal, but we have a vocabulary for discussing performance. We might call this "design-1" in which design functions to enhance engineering. It concerns mechanical and physiological aspects. Where human interpretation is involved, it tends toward the "tool" model, i.e. human understandings are taken as givens to be realized not changed.

Design-1: engineering

Epistemology of design-1

Design-1 not an area of theoretical difficulty. Professionally, designers make important contributions in this area, particularly as the adoption of a design process can rationalize development and production to enable as faster and lower cost product development, lower cost of manufacture, increased consumer demand, and extended product life. Also, powerful, computer aided technologies can be applied to extremely complex organizational and technological systems, involving hundreds of variables, allowing designers to visualize, map and reconcile internal contradictions in such systems, often enabling them to create new and more functional entities. Many design problems particularly within vertically integrated markets, are cross disciplinary, leading to the notion of design as an integrating, quasi-management function within the firm or as a form of management consulting. Design-1 may represent the application of design insights back to the fields of engineering, marketing, etc., but once reapplied those fields continue more-or-less as usual.



The Nature of Design II

Design-2: symbol

Design-2: the problem of symbolic function

Where makers and users are interpreters, and their artifacts function as active social and cultural entities, we have a different set of problems which we can classify as communicative or symbolic: symbolic because they are characteristic of symbol systems, and communicative because they are constituent problems of intelligibility in communication design. As societies become more complex and interdependent, as information becomes a larger component of the social product, and as products become more “language like,”* communication issues become ubiquitous. In addition, the more we work with information systems and the more we study communication, the more difficult it is to separate communicative processes from physical ones.

* a phrase coined by Klaus Krippendorff and used in his work on product semantics

Design-2: symbol

Challenges of design-2

But as designers, we have difficulty with symbolic issues: in explicating the relations between meaning and form, particularly in ways that give designers criteria in the construction of artifacts which enable the maker's communicative intent to be interpreted by the receiver. Critiques often largely discuss formal considerations, or work backward, e.g., “this didn't work try something else.” We can often more-or-less agree when a communication is successful, or *that* it is successful, but are less than articulate about what the communication goal actually is and how the structure of the communication accomplishes that goal. Design-1 questions of legibility and bandwidth do not begin to address the difficulties we have with information, computer mediated learning, and multimedia, nor do they rationalize the multiple form material, and color decisions we know in the vernacular as “style.”* Design-2 issues such as clear notions of communicative goals and means elude us.

* The notion of “style” is ambiguous and often pejorative – style versus substance – but in the concrete world, artifacts have their own individual characteristics, and only cue us as to what they are. Style refers to all of those concrete world aspects that bracket or interpret artifacts by giving us cues as to how well, when, by whom, they were made, and what social movements they represent, to name a few.

Design-2: symbol

The Problem of communication: natural language

The most common approach to the question of communication, has been through formal languages and semeiotics, to see if we can clarify interpretation. But, the difficulty or perhaps impossibility of building a model of how natural language functions is an important theme of twentieth century philosophy. We have retrospective accounts for how we understood utterances, but we are not so successful when we try to project them into rules for production. While we have languages for enclosing technical systems, we have not succeeded in developing higher level discourses to enclose and stabilize symbolic function. In everyday life, we feel generally confident that we more-or-less understand and are understood, but we have a devil of a time figuring out what “understanding” means or how it works. Thus, while such formal systems as semeiotics can clarify utterance, it seems unlikely that they will help us clarify communication as it occurs naturally.



The Nature of Design III

Design-2: symbol

The problem of chronic ambiguity

We have also come to recognize the malleability of symbols, and to perceive ambiguity and symbolic manipulation everywhere. For example, Tamas Maldonado argues that “comfort” which seems personal and self evident, can be seen as external and manipulative: “We may say, then, that, in its most hidden recesses, comfort is a scheme for social control.”* This leaves design in a difficult position in which we observe such unintended consequences, and deconstructive reversals as evidence of incompetence, or social contradiction. At the same time, stability may indicate reification, or barriers to change. It is harder to measure success and harder to know what success is. In short, where the epistemological and ontological claims of design 1 are clear – we know what the world is, and how to describe it, those of design 2 are murky and contradictory, both to designers and to members of modern technocultures in general.

* Maldonado, Tamas. The Idea of Comfort/Cambridge, MA; Design Issues, V. VIII, N1, Fall 1991, p. 35

Part of the problem of ambiguity stems from the need for logical systems to specify: to define, but this is unlike the natural world. In the natural world, we often interpret by triangulation, talking around points, often ones which we don't have names for, e.g., comfort is self evidently sensory, and it is external, and manipulative and we recognize it not by a definition but by all of the things we can say about it in interaction.

Design-2: symbol

Symbolic interactionism

These design problems reflect issues of what George Herbert Meade called symbolic interaction, which has been developed in the work of Herbert Blumer, Kenneth Burke, Harold Garfinkel and Erving Goffman, to name a few. Symbolic interaction avoids the problem of language per se, by shifting the center of attention toward interaction. In important ways, symbolic interactionists do not believe in closure or cause. To make an analogy, Foucault reminds us that initially, we produced goods for ourselves, and traded some of them with each other, but that as markets grew, they came to dominate both producers and consumers: that the market structure largely defines what is produced and what is consumed. By the same token, in symbolic interaction, it is the interaction as a process which dominates over the individuals who engage in it; Each of two chess players wishes to beat the other, but both are committed first to playing chess. Situations as we understand them (referred to as our “definition of the situation”), provide perspectives or filters through which we look out, they are how we know what we are doing, and they guide us in our behavior. We come to see even ourselves in terms of how we function in the myriad situations in which we find ourselves, which is to say, how we interact with others. Situations are constructed symbolically, by the definitions and meanings of them we carry in our heads. Words are symbols, but so, often are things, e.g. a rose when it is given by one person to another, and other behaviors, e.g., if I look at my watch as you talk to me, or keep you waiting for an appointment.* Most particularly, situations are processes, or patterns of behavior more often built up and with outcomes, than conceived of and structured from above. In S.I. communicative behavior is social interaction rather than objectified language.

* Such gestures as winks can entirely transform an utterance. given our ability to consciously control language, we often take gesture to be a more genuine indication of persons' intentions than their words—in that sense actions speak louder as symbols.

The Nature of Design III

Design-2: symbol

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The Nature of Design IV

Design-2: symbol

Rhetoric as epistemic

Thus, symbol systems are powerful, highly malleable, and open ended. they are rhetorical, operating simultaneously on the levels of content, and interaction.* If persons, as actors, construct their realities, their cultures and civilizations, the question of "what is" is replaced by the question of "what is believed to be," and "what has been constructed (all interactions entail roles, all actors are designers)." In this sense, in the symbolic world, truth is what the procedures for constructing it (whether linguistic or behavioral) make it to be.

* It is not, for instance possible to tell if a communication is uttered to support an interaction or if the surrounding interaction supports the communication, and it is often not possible to separate the two.

Design-2: symbol

Symbol & self-transformation

Finally, and perhaps most important, symbol use is a powerful method of rapid self-transformation: information processing implies learning and change: redefinition of situation and self. If the various elements of a system remain stable, their states are solvable, but when they change by transforming themselves and each other, even if there are only a few of them, they and their gestalt become unresolvable: equivocal, "multivocal," or semeiotical decentered, and unpredictable. It is perhaps this which most effectively undermines the credibility of reductive strategies.



The Nature of Design V

Design-3: scale

Design-3 large scale design & open systems

On the large end of the scale we have the fields of urban and social planning. While those who work on large scale projects are usually called city or social planners, designers work on this scale, for example, in new products or forms that become ubiquitous or that resonate through the rest of the culture. In order to function on this level, we often need to be able to enclose human symbolic systems within larger frames. At this level of synthesis, design confronts three challenges: 1. the relations of conception to the resulting details, 2. of the parts to the whole, i.e., what happens when the artifact becomes ubiquitous, and 3. the relations between direct and indirect consequences. The problems of goals and details which we encounter, for example, in large buildings often have to do with the problem of representations, i.e., such structures are conceived in terms abstracted from observation, but we experience them in the concrete world, with all of their individuality. While we can abstract from existing artifacts to define new goals, those abstractions are not in themselves adequate to construct a satisfying concrete result in the world. It is one thing to define a necessary set of criteria that a design must fulfill, but quite another, often impossible thing, to define an exhaustive set.

The relations of parts to wholes and of direct to indirect consequences are analogous problems, looked at first as extension in space, and second as extension in time. Unlike the Kantian notion that what is right functions universally, in the concrete world we often find reversals. Cars decrease transportation time, but as they become universal they clog roads, cause urban sprawl and transportation times return. In the world, generalization is as much a problem as in theory, consistency is necessary.



The Nature of Design V

Design-3: scale

Open systems & retrospection

The problem of retrospection is well known to us as one we encounter and understand through narrative so let's begin with an illustration. Billy Tyne and the crew of the Andrea Gail, a seventy foot cod boat have been caught at sea. In the course of thirty-six hours as they were fishing on George's Bank, a tropical storm started up the coast, intensified, and took aim at the waters off New England and Nova Scotia. They have tried to race the hurricane to Gloucester but they have lost. The seas have quiet with the winds backing around- a sure sign of trouble – but now the storm is upon them.

In a sense Billy's no longer at the helm, the conditions are, and all he can do is react. If danger can be seen in terms of a narrowing range of choices, Billy Tyne's choices have just ratcheted down a notch. A week ago he could have headed in early. A day ago he could have run north [away from the storm] like Johnston. An hour ago he could have radioed to see if there were any other vessels around. Now the electrical noise has made the VHF practically useless, and the single sideband only works for long range. These aren't mistakes so much as an inability to see into the future. No one, not even the Weather Service, knows for sure what a storm's going to do.*

* Junger, Sebastian. *The Perfect Storm*. New York; W.W. Norton and Company, 1997

Narratives can give us the impression of closed systems: we are steered toward "the result" and trace back to causes. Of course, we are at often at but one of many possible outcomes, and we have many factors. Our typical model for dealing with these situations in the world is experience: memory and pattern matching. If we have a few close calls, we recognize new situations that bear similarities and sense their potentials: thus, we structure action (in this case the actions are thought of as decisions) spaces according to pattern recognition based on past experience. This sort of learning is not dependent upon theory; it requires by memory and the recognition of pattern similarities. It accords with our senses of premonition, and suspicion, and the synthetic richness we see in the world that analytic theory lacks. For instance, while computer/analytic methods can match human capabilities in Chess, in the game of Go which has far simpler rules, but forms more intricate patterns, computers can be routinely beaten by amateurs with a year of experience. "People are so good at dealing with fuzzy concepts," said David Mechner, a doctoral student in neural science at New York University who is a top-ranked amateur Go player. But how do you tell a computer that several stones might end up being connected, but not necessarily?" Much project oriented practice in design, as in the visual arts, recognizes this, but it is not enough recognized in theory.

* Johnson, George. To Test a Powerful Computer, Play an Ancient Game. *New York Times*, July 29, 1997, p. c-1



The Notion of Self-Transformation I:

Self-transformation and adaptation

The popular discovery of systematic change or self-transformation is a recent one which, according to Stephen Toulmin,^{*} occurred in stages: through the discovery of slow, geological change; and later through evolutionary biology and its argument that biological change grows from individual variation and adaptation. Popularly, "...the [19th century] heirs of Eighteenth Century did not even see history as a connected process at all.... Like all reformers, the Enlightenment philosophers had dreamed of reforming society at a single [rationalist] stroke."^{**} Natural science was essentially taxonomic, knowing biological and ethical forms by locating them in a unified order. Its belief was in the essential consistency and harmony of all knowledge.

^{*} (See Toulmin, Stephen and Jane Goodfield. *The Discovery of Time*. London; Hutchinson & Co., 1965)

^{**} Toulmin, Stephen and June Goodfield. *The Discovery of Time*. London; Hutchinson & Co., 1965, p. 234

The discovery of time

We can see the cultural stage for modernity set by the increasing pace of social change. According to Helga Nowotny:

At the turn of the twelfth to the thirteenth century, something began to stir in Europe. 'Eight hundred years ago', writes Adolf Holl, 'people in some European cities began to feel a strange and previously unheard-of desire. They wanted to know the time " God's time, as the French historian gave way to the time of the traders. What was dawning was a premonition of a future which would prove to be open to the human creative capacity. A future which involved risks, for only someone prepared to risk his or her assets again and again for the sake of an opportunity was able to head for this horizon. With the eighteenth century, the horizon of the future became dynamic. The idea of progress entered the history of the human race and temporalized it. Today the tension between present experience that does not value what is past and an expectation oriented towards what is, in tendency, improvement has largely collapsed. The belief in progress in the last two hundred years has been severely shaken....^{*}

^{*} Nowotny, Helga. *Time*. Cambridge, MA; Polity Press, 1994, p. 16

Time is discovered when the pace of change makes it perceivable on the scale of a human life. The pace of change tracks the growth of communication (interaction across distance) which enlarges the social sphere, through trade, industry, and later, information transfer. In short, societies cause change, and the more we are embedded in society, the more we are subject to change.



The Nature of Design VI

Design-3: scale

Design & open systems

In particular, large scale designs cause a variety of interactive adaptations which alter the environments for which they were designed. Within a mechanical system or closed social order we can build a calculus that maps us from a specific goal to the design that fulfills it. We can understand the relationship between an individual or local goal and the larger context, and we can know if a design strategy is or is not relevant, and go about testing our knowledge. Analytic methods search for what is static underneath the changeable surface. Where they work, they can reliably manage complex interdependent systems.

Design-3: scale

Perception & the pace of change

When they change slowly, dynamic orders may appear static, but within a dynamic and interdependent order, there is no "static underneath," there are no longer stable relationships between local and system levels, or between near term and long term goals. We find our acts subject to unintended consequences. Such ambiguity of consequence, lends an ambiguity of interpretation. The New York Times of July 23, 1997 reports that while wage inflation rates are very low, it may be that raises are "disguised" as promotions. In this environment, positive determinations are also denials, and utopias and maltopias look less like different places and more like the same place from different points of view.

Design-3: scale

Design & instability

Ironically, intervention by design is itself a source of instability; the truly successful and innovative products, like televisions and personal computers, alter the culture. Within what are now obviously dynamic and self-transforming social orders, we are discovering that the popular model on which the notion design is based – of a rational process to improve the products and quality of life – is problematical, perhaps incoherent. It is not surprising that at present, planning, and design are devalued, and that current thinking emphasizes individual entrepreneurial success in the uncontrolled "networked" economy.*

* See, for example, Kelly, Kevin. *Out of Control : The New Biology of Machines, Social Systems and the Economic World*. Reading, MA; Addison Wesley Publishing Co., 1995



The Notion of Self-Transformation II: Stasis, motion, process

The notion of continuous change or progress became pervasive in the eighteenth century. In the nineteenth century evolutionary theory added notion of open ended transformation and self-transformation through continuous mutual interaction between entities within an environment or context. For the ancients, the universe was an order, in the eighteenth century it was a clockwork – an order in motion. In the nineteenth century the notion of process creating continuous self-transformation appeared with the potential to sweep away idealisms from Plato to Kant, as well as the Hegelian teleology upon which Marx based his materialism.

The History of change:

Eighteenth century rationalism and harmony

Sir Isaiah Berlin gives us the following thumbnail of dominant enlightenment thought.

In spite of the vast differences that separated [Western philosophies through the enlightenment], one great presupposition underlies them all, or rather three branches of one presupposition. The first is that there is such an entity as a human nature, natural or supernatural, which can be understood by the relevant experts; the second is that to have a specific nature is to pursue certain specific goals imposed on it or built into it by God or an impersonal nature of things, and that to pursue these goals is alone what makes men human; the third is that these goals, and the corresponding interests and values (which it is the business of theology or philosophy or science to discover and formulate), cannot possibly conflict with one another - indeed, that they must form a harmonious whole. [natural law]*

There were competing routes to this harmonious whole, and conflicting views of what constituted the whole — but through the Enlightenment, the question was not whether that harmonious whole existed, but who had found it. Everything was in principle knowable, and even ethics appeared as a branch of science: rational motivation.

* Berlin, Isaiah. *The Romantic Revolution*. Berlin, Isaiah. *The Sense of Reality*. New York; Farrar, Strauss and Giroux. 1996, p. 171



Culture & Transformation I:

Nineteenth century irrationalism and conflict

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Romantic Thought

The romantic critique of enlightenment thought developed through first Kant, then Herder, fichte, Hegel, Schopenhauer and so forth, via a series of transformations. first there was the attack on the relationship between virtue and knowledge, on the notion that "an ideal state of affairs embodying the correct solutions of all the central problems of life could be worked out, at least in principle."*

...certain among the romantics cut the deepest of all the roots of the classical outlook - namely the belief that values, the answers to questions of action and choice, could be discovered at all - and maintained that there were no answers to some of these questions, either subjective or objective, either empirical or a priori. Secondly, there was for them no guarantee that values did not, in principle, conflict with one another, or, if they did, that there was a way out; and they held, like Machiavelli, that to deny this was a form of self-deception, naive or shallow, pathetic and always disastrous. Thirdly, my thesis is that by their positive doctrine the romantics introduced a new set of values, not reconcilable with the old, and that most Europeans are today the heirs of both opposing traditions.**

* Berlin, P. 174

** Berlin, P. 175



Culture & Transformation II:
Nineteenth century man

The Romantic View of Man

Within the romantic view, man was identified not with reason and calculation but with subjectivism and action or gesture: individualism, activity, and creativity. As corollary:

“We can be responsible only for what is in our power.... What matters now is motive, integrity, sincerity, fidelity in principle, purity of heart, spontaneity; not happiness or strength or wisdom or success, or other natural values, which are outside of the realm of moral freedom.” In Berlin’s view, this “subjectivism” implied imposing values, “worship of integrity and purity against effectiveness or capacity for discovery and knowledge; freedom against happiness; conflict, war, self immolation against compromise, adjustment, toleration....”^{*}

^{*} Berlin, p. 188

The American Cultural Heritage & Design Ambivalence

Some thinkers reformulated the romantic individual in the idea of the state as the historical actor, or in the Geist or spirit, countering the cosmopolitan tendencies of rationalism (logical thought processes work the same way in all of us) with cultural nationalism. There were categorical romantic figures, Carlyle, Byron, Beethoven, but most enduringly influential were those whose positions incorporated aspects of both enlightenment and romantic views. Hegel saw history as the objective development of universal spirit or reason through a series of conflicts or “contradictions.” Marx later translated Hegel into a language of production, class, and revolution. In terms of nationalism we point first at Hitler, then perhaps at Napoleon, but we could also point at the American frontier spirit with its love of “freedom” and disdain of European culture. Japanese advertising celebrity “George” Tokoro puts it this way. “Japanese products are too stiflingly precise and calculated and nervous, ... I’m hooked on American products because they’re so ... random.”^{*} For Americans in particular, technology plays the role of historical actor,^{**} or the means to transcend the contradictions of the present, as, for example, Wired magazine’s “editorial position that technology correctly blended with free market capitalism will make for a freer, happier world.”^{***}

^{*} *Selling in Japan? Get ‘George’* The Wall Street Journal. July 28, 1997, Page A-14

^{**} see Smith, Michael. *Recourse of Empire: Landscapes of Progress in Technological America.* in Smith, Merritt Roe, & Marx, Leo. *Does Technology Drive History.* Cambridge; MIT Press. 1994, p. 37-52

^{***} Harmon, Amy. *Fast Times at Wired Hit a Speed Bump.* The New York Times, August 4, 1997. P. D8, Col. 6

These tensions should be familiar to us. They make equivocal our interpretations of processes around us. Particularly in the United States, we sense an ideological conflict between the planning of design and open markets, which reflect the conflict between enlightenment and romantic views.

| | |
|---|-------------------------------|
| Rationalist design | Romantic: market |
| Collectivist/ collaborative | Individualist |
| Systematic | Anti-systematic |
| Consensual | Entrepreneurial |
| Integrative | competitive/ conflictual |
| Predictability (chaos averse) | Freedom (restraint averse) |
| Thumbnail comparison of design... and market orientations | |



Culture & Transformation III:

Isaiah Berlin's critique of enlightenment

Berlin rejects enlightenment utopianism on two main counts. first, the nature of knowledge as a project is to function reductively – through abstract systems or concepts– while life is experienced first and foremost in the world. The two are disjunct. Secondly, knowledge is reflexive. You or I might simulate operating as if we had a certain stock of knowledge, but to do so, we would actually be operating out of another stock of knowledge, the one that created the simulation.

“Let us assume that he [our utopian] ... is a profound student of history and the social sciences; he will then know that, in order to maintain a certain form of life, more must be done than to wear certain types of clothes, eat certain types of food, or possess certain religious beliefs. We will not succeed in doing this, but merely go through our parts like actors on a stage...”^{1*}.

A few of us could go further. Those with their own realms, and absolute power over populations, able to isolate them from all outside influence might actually create such experiments. We do know of one: Albania, which, by most accounts, has been a place of total unreality.^{**} But finally, we cannot create symbolic systems the way we create mechanical ones.

* Berlin, page 13

** see Jones, Lloyd. Biografi : A Traveller's Tale (also published as "Biografi : An Albanian Quest"). New York; Harvest Books, 1994

Design & Developmental theory

So far, we have accounts of some difficulties and limitations of rational design and its relations to larger cultural issues, particularly the inability within to address issues of self-transformation. We can begin to address this limitation with a more developmental approach for which we can turn to the sociology of Norbert Elias.

Elias is not alone in his general position, but like Berlin, he is useful because he addresses central issues directly, even bluntly. He operationally embeds rationality in the concrete world, and in particular, he relates the symbolic and behavioral levels not as exclusive categories, but as interrelated or meshed together in a complex. He is persuasive in part because his position is grounded in and congruent with social science, and with neuropsychology and AI which seek to construct intelligence as multiple layers of procedural systems. His position is also able to integrate observations which complicate or equivocate older traditions. His work comes from a different angle but resonates with that of Berlin, and Toulmin.



Model of Development I: Elias' "Theory the Symbol"

The difference between man and beast is the development of symbol systems, which provide predefined or standardized meaning units. Unlike earlier biogenetic systems, these are not species wide but differentiated by social group. Symbol systems presuppose social structure as logically and historically prior to the individual: symbols are useless unless they are shared. At the same time, communication through symbol systems makes cooperation possible on a much higher more adaptive and agile level than can be supported by biogenetic based behavioral systems.

The development of symbols does not entail a schism. Symbol use emerges slowly out of earlier processes as a new way of fulfilling old needs. That method appropriates and combines with earlier methods. Thus, I can cry out in involuntary reaction to pain, to communicate my pain, or to communicate pain without actually having it, etc. and it may not be clear to any observer or perhaps even to me which of the three I am doing. We employ high technology in order to watch people kick balls on mowed grass.

We become enraptured by interplanetary travel when we see pictures that enable us to imagine what it might really feel like there. The more time we spend in cyberspace, the more we see how it is like, not unlike the "real" world with real needs and goals. The pre-symbolic levels may be subducted or appropriated, but they remain with us, and within Elias' system, this appears not ironic, but necessary and matter of course.

By the same token, older forms of behavior are transformed by the new use of symbols. Once we learn and understand the use of symbols, all sorts of behavior, like looking at clocks, or lifting brows can become symbolic. Developmentally, communications begin as self centered, undifferentiated reports e.g., baby cries (is it pain or hunger), but develop into subtly differentiated, other or object centered, and synthetic, conceptually structured systems. We have thought of language in terms of those higher systems, but we are discovering the importance of the anchors in the concrete behavioral world within natural language. If it is detached from the pre-symbolic substrate, communication becomes unintelligible, or meaningless. If symbols can be used to proxy behavior, behavior can proxy symbols, and multivocality is the rule. "...in reality, biological and social processes depend on each other; they dovetail into each other when human beings first learn to speak a language."



*Early color image of rover and
Martian surface from Pathfinder*

*Elias. p. 19



Model of Development II:

Knowledge in human development

Elias was very concerned with the question of knowledge: with debunking naive rationalism.

The basic doubt, the fundamental uncertainty as to whether human beings can ever acquire knowledge of the world as it really is which has become a leit-motiv of mainstream philosophy ever since it was formulated by Descartes, is based on a strange assumption which is rarely stated explicitly. It suggests that the cognitive functions of human beings developed initially on their own independently of a world to be recognized and that human beings having at first developed without object of cognition at some time, as it were by accident, entered an alien world. That, however, is a fable. Human beings have developed within a world. Their cognitive functions evolved in continuous contact with objects to be recognized. The symbol emancipation in the course of which socially acquired means of communication gained dominance over those which were genetically fixated enabled humans to adjust their judgment and their actions to an almost infinite variety of situations. Humans did not enter the world as aliens. Subject and object form part of the same world. The biologically logically predetermined propensity of humans to form sound-symbols of everything they experience and may wish to communicate to others bears witness to this fact. The categories they use at any given time in their communications with each other have developed and can develop further in their uninterrupted communication with the non-human world.*

* Elias, p.98

He wished to substitute a theory which could integrate the generation of knowledge with the rest of the human and social life world.

"...knowledge is a sound-pattern [its concrete artifact-ness] that can be stored in the memory of a people [its cognitive aspect], the socially established meaning [outside orientation] of which can pass from a condition where fantasy prevails [lack of knowledge], to another with a high level of congruence [predictable interaction].¹ But, since it is a "system of messages," a means of communication, and of thinking and finding solutions, "it bears no ontological similarity to its objects except if it becomes its own object."***

** Elias, p.110

*** Elias, p.111

In this sense, Elias one of those who argue that it is finally impossible to "get behind" the system of signs to find truth, but the congruence model is constructive rather than deconstructive, and from it, we can build notions interpretability and its prediction.



Model of Development III: Symbols and transformation

While symbol systems are never disconnected from the concrete life world, they have their own characteristics particularly in altering the speed of adaptive change. Symbol use enables us "...to inhabit simultaneously the past [through legend, traditions, and formal records], the present and the future [by means of declared ideals, projections, anticipations, plans and programs].* Symbolic systems carry both continuity and change but without them, we are largely stuck in the present. Thus, even the most restrictive cultural systems open a greater possibility of change than their biogenetic predecessors. In our own era, Data becomes information by structuring decision or action spaces. Thus, information is programming and new information is reprogramming which transforms us and enables us to transform ourselves by changing the ways we act.

The impact of symbol use is speed of change. Geomorphological transformations are typically very slow, Biological transformation can take place quite quickly as viruses mutate or bugs become resistant to insecticides. Next to symbolic change, biological and geological formations have seemed fixed. Symbol systems are powerful forces for transformation. Within Elias' frame, symbol use becomes very closely identified not just with formal communications, but with transformation *in general*, and that is its significance. It combines with the substrates of pre and non-symbolic life both appropriating and transforming them, and being appropriated by them.

* Herzler, Joyce O. A Sociology of Language. New York; McGraw Hill, 1965 pp. 53-54



Building an Original Design Theory I:

Statement

If we grant the statement of design's performance problems, the tripartite taxonomy, Berlin's diagnosis of modern "man" as caught in the opposition of enlightenment and romantic thought and Elias' symbolic interactionist notion of development, we can work toward a theory of design.

Theory of Feasible Design

Let us return to "design-1", technical design or enhanced engineering, "design-2", concerned with the symbolic aspects of products and communications, and "design-3" concerned with large scale social systems and indirect effects. Design-1 does not concern issues of self transformation. Design-3 is not feasible in its current form because the predictability across multiple intervening variables it requires is possible with present technology, only within closed system. I will return to design-3 as a matter of long term intent or process rather than knowledge. Design-2, concerned with the symbolic and the communicative, takes on the central theoretical role of interpreting transformation in general. It is where design theory needs to be built, and where design theory will develop its originality.

By this account, design rests on a backdrop of open ended, socially created and oriented knowledge. Design operates within concrete world situations of interaction involving artifacts and entities, whether human or not, who are able to interpret and reprogram themselves or learn. It is directed toward the understanding of interpretation, i.e. what enables us to interpret the entities in our environment. And toward the roles that designed entities can or do play in such environments. Within an interpretive open environment, design does not function well in the scientific mode, but it can function rhetorically. The term "rhetoric" has for centuries been a pejorative, often with the term "empty" in front of it, or used to imply dishonest persuasion. Rhetoric need not, and should not be devoid of rigor. Well practiced rhetoric explicitly relates such rigor to the concrete world, and it opens the symbolic and the concrete to each other.* Rhetoric can deceive because it can speak. It is the medium for testing congruence.

* Since the 1960s, there has developed a literature of rhetoric as epistemic. For example, see Scott, Robert. On Viewing Rhetoric as Epistemic. *The Central States Speech Journal*. V. 18, #1. 1967, p. 9-17; Brinton. Alan. William James and the Epistemic View of Rhetoric. *Quarterly Journal of Speech*. V. 68, 1982. P 158-169; Gregg, Richard. *Symbolic Inducement and Knowing : A Study in the Foundations of Rhetoric (Studies in Rhetoric/ Communication)*. University of South Carolina Press. 1984



Building an Original Design Theory II:

Confronting the dual lives of artifacts

The discussion of an actual theory to relate design decisions, particularly of configuration or “form” and communication to interpretation is outside of the limits of this essay, and we have only fragments of such a theory, but some directions can be indicated.

Artifacts as social objects

first, symbol systems operate as proxies for other forms of interaction, and they operate as actors and between actors within situations or structures of behavior; that is their rhetorical location, and it is how the concrete world is embedded in them. In face-to-face situations, the actors are available to each other and are able to mutually clarify the occasion and their roles. In order to be intelligible, designed artifacts need similarly to represent the situation of use and the roles that comprise it. Thus, the goal of communication design is not the transmission-reception of a message, but to enable congruent interpretive reception. Artifacts can be analyzed in those terms: the representation of sender, receiver, and situation, and the cues which support interpretation.

Sender and receiver as collaborators

Given the dual lives of artifacts in the concrete world, As interpreters, we have to figure out what characteristics are relevant to what purposes and how they are connected. This does not mean that my interpretation, for instance, is necessarily idiosyncratic, but to the contrary that competent interpretation tries not to be idiosyncratic, seeking an understanding of the situation, the problems of the sender, and various anticipations, particularly of the understandings that one can think informed the sender. All interpreters and senders must deal with these issues, we can build a collaboration between sender and receiver upon common recognition of these problems. In Erving Goffman, words, “... we find ourselves with one central obligation: to render our behavior understandably relevant to what the other can come to perceive is going on. Whatever else, our activity must be addressed to the other’s mind, that is, to the other’s capacity to read our words and actions for evidence of our feelings, thoughts, and intents.” (p. 51) Our common understanding of our interpretive problems provide us with methods for building solutions: cues and shadings of word choices that are read as intentions. This mutual understanding is codified, for example, in the situations of publication, and it leads to the impersonal rituals or language of published communication.**

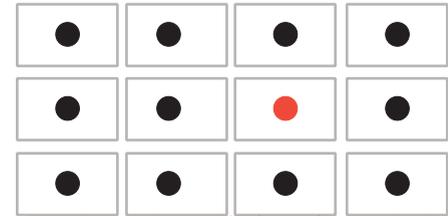
* Goffman, (1983) The Interaction order, American Sociological Review, 48:1-17, cited in Charon, John. Symbolic Interactionism. Upper Saddle River, New Jersey; Prentice Hall, 1995, p. 159

** See Krippendorff, Klaus. A recursive Theory of Communication. Crowley, David, David Mitchell, eds. Communication Theory Today. Stanford, CA: Stanford University Press, 1994, P. 78-104



Building an Original Design Theory III: A multilayered theory of reception

Elias argues that there is no sharp distinction between symbolic and behavioral levels of functioning, and recent research in psychology is beginning to move us toward a differentiated notion of interpretation, which argues that it is anticipatory and that it operates by a variety of mechanisms. Experiments have indicated, for instance, that a flight response in minnows can be elicited by the odor of extracts of crushed minnow skin^{*} Everyday interpretation is very much a matter of anticipatory overdetermination – on-the-fly choice from among already known interpretations on the basis of cues. What is emerging is a combination of interpretive methods and levels, from hard wired, like the recognition of geometric edges and corners, to pre-analytic pattern^{**} recognition, like the recognition of fear which takes place in a very early part of the brain, learned recognition like the face of a friend, the pattern recognition which seems to underlie human competence in structuring indeterminate problem spaces, finally conscious problem solving by parsing. Learning studies indicate that even highly complex processes once they are adequately routinized by repetition, fall below conscious awareness. Studies of oral transmission document the mnemonic importance of pattern schemes like rhyming in developing anticipatory interpretation, and in stabilizing recollection and understanding.^{***} Some current studies concern effects that operate on more than one level. Taken as a whole, this work can provide a useful base for theories of visual and auditory rhetoric which are neither positivist nor phenomenological, nor literary alone, but rationalize important findings of all of those perspectives.



Experiments in psychology demonstrate that if a series of black dots flashed, and among them one red dot is flashed, all for the same amount of time, that the red dot will be perceived as having been flashed for a longer period of time, about 30%. But, subjects can train themselves to attend to the time between flashes. To rule out this effect, inter-stimulus times are routinely randomized. Similarly, design rhetoric often exploits “exceptions to the rule” as in-built human interpretive apparatus.

* See Hall, Edward. *The Hidden dimension*. New York; Anchor Books, 1982, p. 48

** See Marr, David. *Vision*. New York; W.H.Freeman & co., 1982; or Kosslyn, Jeffrey. *Image and Brain*. Cambridge, MA; MIT Press, 1994

*** See Rubin, David. *Memory in Oral Traditions*. New York; Oxford University Press, 1995



Building an Original Design Theory IV:

Design theory perspectives

1. From this perspective, design-2 studies the symbolic relations between artifacts and humans as they are used to construct maintain or change interactive patterns. Design theory concerns problems of coherence, organization, stabilization, and change in symbolic relations involving humans and artifacts. Design practice seeks to intervene in the social process of forming artifacts, altering their formation to better accommodate or fit with their environment, or to change the environment in which they function.

2. The appropriate model of Design is rhetorical rather than scientific. This model situates design within the world and connected to concrete world goals, but with areas of expertise from which it can advise.

3. Consistent with its expertise, design should be guided by the notion of fiduciary responsibility: representing the interests the interests of clients.* As fiduciaries, designers limit their claims to knowledge and share responsibility with clients. Designers need to identify their clients their clients' interests, and engage in communication. This position does not solve the ethical issues, but helps clarify them and is consistent with many other professions.

* For a larger discussion, see Bayles, Michael D. Professional Ethics. Belmont, California; Wadsworth Publishing Company. p. 69-125

4. Designers must work from knowledge about communication and social interaction, cognitive and developmental psychology, speech (rhetorical theory), information theory, as well as philosophy of language, and ethical theory. Various aspects of these fields need to be selected and recast in terms of the particular focus of design, i.e. the construction of competent products and communications.

5. Design needs a positive but open theory of communication. This is a particularly difficult question.

6. The traditional ethical legitimations of design which define "good," "useful," or ethical products are claims which have validity and credibility only within local contexts. In this sense, the good is a "moving target." Openness and adaptability to changing goals and environments emerges as a reasonable reconstruction of large scale design goals. Operating within a fiduciary practice, design goals should be public: defined and discussed within the sphere of public discourse. Performance should be open to public measurement.

7. The ethical model of design practice should be developed in order to provide a structured account of motivation, and of the problematics, or goal oriented issues that the practice of the field represents. The notion of "fiduciary responsibility" is an account used in other professions.

