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A Field for Growing Doctorates in Design?

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Bruce Archer's Message:

Hearing of this conference, Bruce Archer faxed us something he wrote as a "stimulus paper" for a similar gathering in England. It was meant to constructively intervene into an ongoing debate between two schools of thought on a doctorate degree in such practical disciplines as architecture, art, dance, design, education and engineering:

- "One school of thought (he suggests) favours the amendment of universities' traditional Ph.D. regulations so that submissions for examination in such disciplines may be presented largely in non-written form. … There are those in conventional academic disciplines who have objected to the 'watering-down' of (such) regulations, arguing that this debases the standing of the traditional research degree."
- "Elsewhere, some university staffs in practitioner related disciplines have objected to the adoption of 'watered-down' M.Phil. and Ph.D. regulations on grounds that the traditions of scientific and scholarly research distort the proper study and acquisition of competence in advanced practitionership. Such objectors favour the wider adoption of doctoral degrees that are explicitly degrees in practitionership, rather than degrees in research or scholarship."

Then he goes on to note that there already are doctoral degrees in practitionership, some with a respectable history, for example in law and in medicine, recently also in education and in engineering. He concludes recommending that one may want to examine such degrees as models that overcome the gap between the two positions outlined above.

I want to take this recommendation to heart. I too have asked myself in the past why medicine, for example, which is as practical as is design, has developed such an astonishing body of professional knowledge, solid institutions and respect in society, all of which is lacking for design. Let me use another area for comparison with design, communication, with which I am quite familiar.

In fact, I am holding two advanced degrees, a Diploma in Design from the Ulm School of Design and a Ph.D. in Communication from the University of Illinois. On account of the latter I teach at University of Pennsylvania's Annenberg School for Communication. Communication is only half the age of design but has gone so much further and comparing it with design might well hold the answer for what is needed to establish a doctoral degree in design.

In the following I will give a brief history of how communication rose to prominence, compare its principal features with the state of design so as to show what needs to be done, and conclude with five propositions and for generating advanced graduate education in design.

A Brief History of Communication as a Field

"Communication" is a somewhat strange designation for a field of inquiry. It is what all humans do in everyday life, it denotes the object of communication scholarship, and it also constitutes the medium in which the results of such inquiries are presented to peers. Evidently, it lies in the nature of communication to reflect on itself. Some colleagues call themselves *communication researchers*. Some university departments consider themselves engaged in *communication studies*. Some speak of *communication science*. At some point the word *communicology* was coined but it did not take root in the U.S. This terminological variety might be confusing to marketers, but "in the field" it seems not. I surely do not want to call communication or design for that matter a discipline. This conjures images of punishment for bad behavior, strict conformity with a norm, or what the military does to its recruits -- Michael Foucault wrote cogently about that. Unlike disciplines, *fields* need to be cultivated and seeded in order to grow many varieties of plants, including weeds. With this in mind, let me sketch its history.

Journalism is the origin of communication. Journalism is a very practical activity, much as design. Unlike designers, journalists write reports, but much as designers, for large audiences. Until about 60 years ago, journalists exclusively wrote for journals, newspapers and magazines. This made journalists part of a particular technology that mass produced print and their daily practices were subject to technical, legal and economic constraints -- which is what journalism schools had to teach besides good writing. Journalism is also a public affair and entails professional responsibilities to the public. Much of what journalism teachers had to do was to look into these responsibilities, formulate ethical principles, and instill them in the how-to-do courses in journalism schools.

During WWII, radio entered the public sphere, later followed by television. These two novel media threatened newspaper publishing and created competition if not ideological confrontations between the institutional proponents of these media. The fact that they also offered new kinds of jobs challenged the monopoly of journalism education as well. Journalism schools reluctantly responded by expanding existing curricula to include radio and television.

In 1948, the University of Iowa was the first to grant a Ph.D. in Mass Communication to a student from its journalism school. Only two years before, in 1946, the word "communication" appeared for the first time in the title of a graduate-only course. It was used then as an umbrella term to embrace what these three media had in common. The word "communication" did not however alter the *journalism paradigm* of responsible reporting, objective writing, the creation of *a product* that large mass audiences would appreciate for its *information value*. With the embrace of the new media, journalists managed to remain in charge of the news in radio and in television, but lost control over fictional programming, which came to be considered outside journalistic ethics and pursued Hollywood-style, just as it had lost control over newspaper advertising in the early part of the century. Critical examinations of the social/cultural/economic dynamic of these new media fell outside journalistic concerns as well. A Bureau of Radio

Research was founded at Columbia University, initially financed by those concerned with the effects of the new media, later renamed Bureau of Social Research, which pioneered communication studies outside the journalistic paradigm.

The architect of the "communications plan" for University of Iowa's journalism school, Wilbur Schramm, impressed the President of the University of Illinois, Urbana IL, so much that, in 1947, he was offered and accepted two positions that were to become instrumental to the future of communication. He became the director of the University of Illinois Press and he was given the opportunity to build an interdisciplinary Institute of Communications Research.

As the director of the University of Illinois Press, one of his first projects was to publish Claude E. Shannon's *Mathematical Theory of Communication* together with commentary by Warren Weaver. This was in 1949. The theory and its commentary appeared in less accessible technical journals the year before and came on the heels of Norbert Wiener's 1948 "cybernetics" as the science of communication and control. Unbeknownst to most contemporaries, the small book proposed *a new paradigm* that radically challenged our way of thinking. It saw communication no longer as a written product, but as the transmission of information from senders to receivers via channels, this information being variously encoded, decoded and processed. It generalized communication across all media, past, present and future. It was less concerned with the truth of a report than with "who? says what? to whom? through which channels? and with what effects?" It introduced *a new vocabulary* into the discourse, addressing phenomena heretofore conceptually unavailable. It generated a huge literature. After 50 years, Shannon's 1949 book is still in press.

As the director of the Institute of Communication Research, Schramm was able to obtain the cooperation of faculty from several departments at the University of Illinois and to attract others to join his Institute. The institute was organized around research projects rather than a structure. The word "*inter-disciplinary*" was not commonly used then, but today we would recognize the Institute as an example of that kind of cooperation. In 1949, the Institute announced a (in retrospect the first ever) graduate program in communication, terminating with a Ph.D. in Mass Communication, in 1953 renamed a "Ph.D. in Communication." The first Ph.D. in (Mass) Communication from the University of Illinois was granted in 1951.

In this remarkable convergence, the institutional backbone of the field began to take shape, not just around a *literature*, initially books followed by widely used *textbooks, research reports* that advised government and industry and *journal articles* in numerous related fields. The Institute also produced the first round of future *teachers* who would open communication departments everywhere, *scholars* who would contribute to these publications, and *jobs* in academia and industry.

In 1950, the University of Illinois School of Journalism, a leading school in the U.S., renamed itself School of Journalism and Communication and accepted the Institute's Ph.D. as its terminal degree. Other schools followed suit and it became almost fashionable to use the term "communication" in journalism courses with a broader scope and to develop educational programs with advanced degrees in communication. Renaming by itself did not necessarily reflect a change in educational missions, especially not in how communication was conceptualized and taught. Old paradigms die slowly. Till this day, there are graduate

departments that continue to reproduce the older journalism paradigm by thinking of communication as the production of messages. This text-centered conception has survived in so-called media studies, emphasizing media as representations, without process and without human's social involvement. We would now say it is not human-centered. Casting old theories in new cloths added a technological and universalizing twist to the idea of writing journal articles, but it began to become eventually aligned with the new way of conceptualizing communication. I think it is fair to say that it was the emerging consensus on a new communication paradigm, not the use of a fashionable name for an old professional practice that made all the difference, literally in the world.

In 1950, a group of teachers and practitioners, all members of the Speech Association of America (SAA), founded the National Society for the Study of Communication (NSSC) and a decade later walked out of SAA, renaming itself the International Communication Association (ICA). This association provided communication researchers *a professional association* of their own. It now has about 3,000 members. In this association, journalism was no longer a category. Its initial divisions were:
1. Information Systems,
2. Interpersonal Communication,
3. Mass Communication, and
4. Organizational Communication.

The generality of communication became the organizing principle of this academic association. The word "international" expressed a belief in the limitlessness of this human phenomenon. Today, there are about seventeen divisions and interest groups addressing numerous communication issues. ICA is not the only communication association serving the intellectual needs of its members. Its annual meetings are one of several places where communication scholars get and test their ideas, where scholarship is evaluated and authenticated, where communication research findings are made visible to peers.

Around that time, several journals foe related issues were published and read widely. I am thinking of *Journalism Quarterly, Journal of Broadcasting*, *Public Opinion Quarterly, Behavioral Science, Journal of Abnormal and Social Psychology* to name but a few related ones. But ICA started to publish its own trail-blazing *Journal of Communication*. Now, quite a number of journals have aligned themselves with the study of communication and communication scholars have numerous outlets to publish their work.

The new communication paradigm that fuelled these staggering developments not only embraced the emerging media of communication, it also attracted scholars from a variety of disciplines to join hands and elaborate it, sometimes even to fertilize their own fields with it. There emerged sociologies of knowledge, ethnographies of speech, political systems theories that took communication to be their central feature and political-economic analyses of the mass media. Organizational consultants realized that it was communication that held an organization together, psychologists reconceptualized their interest as intra-individual communication, psycholinguists tried to bridge knowledge of language with that of human behavior, and so forth. Cybernetics, put its conceptions on the table, enriched the discourse of communication with numerous concepts and brought diverse technical professions into the fold: information theorists and communication engineers, mathematical systems theorists and computer scientists, and so forth.

Communication became an *inter-disciplinary* if not *multi-disciplinary* undertaking without aiming at it.

Now, doctoral programs in communication are widely accepted. This was not without struggles. Other disciplines started to claim the territory that communication scholars had opened up for inquiry. Occasionally, communication programs were downsized or discontinued, but demands rose as more and more problems could be linked to communication. Now virtually every major university in the U.S. teaches at least undergraduate courses on the subject, many of which feed Ph.D. programs in communication. A typical doctoral program in communication offers:

- A variety of own graduate courses on the *basic concepts* in the field, on *theories* of communication, supported by textbooks and journal articles. Most communication departments also collaborate with other departments in their university that could offer courses in related areas.
- Training in the key methods of inquiry: content analysis, survey research, experimental design, data analysis, literary techniques, and ethnographic methods.
- Opportunities to work with professors on various projects, applying these concepts and methods of inquiry to contemporary problems with theoretical or practical implications.
- Encouragement to engage in professional discourse by expecting students to present papers at academic or professional conferences, subscribe to communication journals and publish.
- Doctor of Philosophy degrees predicated upon completion of an original piece of scholarly work.
- Some help in finding jobs in government, industry, academia, or as communication experts in numerous professional areas: research, management, the mass media and law, even in therapy.

In sum, within a rather short period of time, shortly after WWII, communication organized itself around **a new paradigm**. It grew out of journalism's need to expand to radio and television but quickly expanded its domain of application numerous areas far from journalistic concerns and came back to alter the conception of journalism and of communication in society. It also inspired many scholars and practitioners to collaborate on this new conception. An **institutional infrastructure** developed that consisted of a network of research institutes with exciting projects, educational programs toward advanced degrees, and connections to industry and government with **new kinds of problems** to tackle. This, in turn, generated **jobs** and more *funding*. **A body of literature** developed around theories of communication. Books**,** journals and text books recorded the history of the field, allowed knowledge to grow cumulatively and, above all, provided visibility and generated public respect for people working in this field. It simultaneously encouraged **a community of scholars and practitioners** to grow, whose members, read and contributed to the same journals, spoke the same language, and met regularly at **professional associations** of their own. In this community, individual members present their projects, critically evaluate those of their fellow members, arrive at a consensus on acceptable methodologies of inquiries, but also generate employment opportunities. The idea of communication has caught on in very many free countries all over the world (in fact after serving as President of ICA, I am the current chair of an International Federation of Communication Associations). Communication has enriched the understanding not only of what journalists are doing but also of human communication in general. We can say communication has made it.

Ph.D. education was only one feature in these concerted developments. I am suggesting that it cannot succeed without parallel efforts to build institutional, literary and community support.

Where is Design by Comparison?

Design is far younger than medicine but twice as old as communication. Why has it not taken off the way other fields of inquiry did? Let me present some observations that might suggest ways to overcome these obstacles -- and I am speaking here as an insider to design and as an outsider to it as well.

In the U.S. there are many well-known schools of design. They have graduated some of the best designers in the world. Some universities offer terminal MA and MFA degrees. The Illinois Institute of Technology (IIT) has a Ph.D. program since 1992 from which one student has graduated so far. On the undergraduate level, education is well instituted. This is comparable to the state of journalism education in the 40s, when it came to be challenged by radio and television. Now, design is challenged by the newer media. If it does not embrace their implications, it will remain what it was and allow the torch of excitement to be carried elsewhere.

Most participants at this conference were surprised to learn that the University of Minnesota offers a Ph.D. in Design as well, and how many Ph.D. degrees were granted in other countries, from Finland to Australia, even so close to the U.S. as in Montreal. The lack of knowledge of Ph.D. education in the U.S. is indicative of one of the problems design is facing. Designers do not know much of what other designers are doing -- except for the disciples of a few design beacons whose work is published in slick magazines. A well-organized *community of designers is nearly absent*. A community requires that members talk to each other, know of each other's work, respect and support each other. Without such a community, institutional infrastructures can be neither build nor kept going. In communication, networks of researchers that could work together across different areas formed quickly, even before a consensus on the name became apparent. Communication programs did not exactly sweep the country; in fact it often was an uphill battle, with students demanding more and administrators resisting new degrees. Nevertheless, such programs emerged within a few years of each other and their graduates and teachers formed professional associations that furthered their work. Journals did their part in holding such associations together. This is not yet so for design.

In his dinner address, we learned from Craig Vogel, President of IDSA, that the majority of IDSA members are not likely to favor a Ph.D. in Design. This is a sad and unfortunate reality that can only be overcome by building a community that is supportive of advanced degrees, perhaps by starting an *Association for Design Studies* outside IDSA, or by building an active Internet community that keeps the well-meaning designers informed and in touch with each other. I do not think a Ph.D. makes sense without a viable community that appreciates their work and supports scholarly contributions to design.

Too often, *design is seen as a service to industry*, as having no right to claim a separate body of knowledge. This is already inscribed in the label "*industrial* design." Fashion designers, interior architects, graphic artists and architects enact this dependency by deferring to clients, certainly for the definitions of their problems, but often also for the criteria applicable to their work. Consequently, research by designers is mostly geared to solve the problems that arise in the course of developing a commissioned product. Fundamental research, inquiries into principles of design and the development and testing of methods to implement them are different tasks, rarely pursued and even less often published. In a way, design has not overcome its "parental dependency" stage. It will have grown beyond it when it actually drives human interfaces with technology and its clients stand in line to fund its innovations. Not even industry's interests are served by designers, who compete for making a product more attractive, when innovations in the domain of the human use of artifacts are badly needed.

It has been suggested that this dependency on industry does not apply to historical or critical scholarship on design. This is true, but, as Sharon Poggenpohl suggested at this conference, *historical and critical scholarship on design looks at design from its outside*, to which I like to add, with categories of scholarship *borrowed from other disciplines*. This stance can hardly support designers' understanding of themselves as designers. The few design teachers that hold Ph.D. degrees have earned them largely in art education, art history, or English literature, often holding on to these outside-observer perspectives.

Along the same line, design has *comparatively few journals* of its own, at least in the U.S. The few that are published are rarely ever used in classrooms. This may be traced to the fact that design journals tend to take the aforementioned outsider's perspective on design, which is not particularly helpful to those within it. However, the responsibility for this state of affairs lies squarely by the design practitioners, who do not like to read and do not write much either, leaving the writing on design to non-practitioners. Public presentations by designers often boil down to slide shows of products with commentary, the oral version of picture books with captions. This may impress clients but does nothing for the development of a body of professional literature that the community of designers can identify with and build upon. A counter example is that many designers, at the onset of a project, feel the need to create bibliographies. These are often shared but rarely ever used or converted into survey articles. In other academic areas one would find such bibliographies in handbooks or an article that routinely reviews the relevant and latest literature on its subject. In the social sciences, separate bibliographies are rarely created. Unless designers start inquiring into their own practices, publish their methods, tie their own work to that of others, open their intellectual resources to colleagues and use design publications in their own work, … unless there is an appreciation of design scholarship, Ph.D.s in Design may end up being very lonely and virtually lost to design.

Apropos *indigenous design knowledge*, I recently had reasons to reexamine the *curriculum* at the Ulm School of Design and was astonished rereading what was offered there in the early 60s when I studied towards a Diploma in Design: philosophy of science, aesthetics; methodology, planning techniques, game theory, decision theory; information theory, communication theory, semiotics; social psychology and physiology of perception; sociology and cultural anthropology. These areas, perhaps not as well taught as we could teach them now, helped us to define arguable paths for design to move forward. To be sure, today, we are faced with a vastly different technology, for example technological virtuality; we have new concerns, for example ecology,

cultural diversity and semantics. Still, thirty years after Ulm, it is amazing that there seems to be no school or institute of design that makes a comparable intellectual effort to generate design specific knowledge.

There also are *no research institutes in design* in which design knowledge is formulated, investigated, written down and passed on. It takes considerable amount of trust for funding agencies and universities to invest in such institutes. Communication started out with nothing more than the promise of a new approach to seeing the world. It made good on this promise by providing compelling research results and valuable advice to government and industry. Its case was also made by many reputable scholars who felt attracted to this new paradigm and became part of the communication discourse. The case for institutes of design studies has not been made and backed up by tangible results. As it is, most design departments are poorly financed in contrast to departments of communication -- not to compare them with the traditional areas of scholarship from engineering and the humanities to medicine and management. Research proposals by designers without a Ph.D. have a hard time competing with those who have this certification for scholarly work.

There also are *no common textbooks*. Texts that do claim some generality, often published at considerable personal expense, end up not being used because someone else wrote them! A social pathology, widespread among designers, surfaces in only hesitatingly acknowledging the good ideas of others – passing them on only with criticism or usurping them by adding some "improvements" and another name. Its effect is that outstanding ideas become diluted to the point of unrecognition. In other fields, there are pioneers who work at its frontier, followed by researchers who fill in or work out the details, followed by the writers of textbooks which are in turn read by thousands of students, trying to work their way to the frontier. In other fields, textbooks are a big business with publishers pressing to get updates every few years. They create a history of the field and a body of knowledge to build on. They provide common ground for collaboration to take place and for cutting edge scholars to be recognized for their contributions. My text on *Content Analysis*, published 18 years ago, is translated in four languages. Design does not need to be compared with economics, psychology or English literature, which is taught almost everywhere and to large classes, but engineering or medicine should offer good models -- as Bruce Archer suggests – and so would communication seem to be. In these areas, basic ideas need to be mastered to serve as stepping stones to independent work. In design, there seems to be no consensus on what the basic conceptions are and its literature seems not to produce a shared history, a sense of continuity, cumulative growth and coherence across educational institutions, which is constitutive of other fields.

It has been said that design is fundamentally concerned with visual images whereas scholarly work is based on writing. This is true, but only superficially so. As a social practice, design needs to inspire enough and especially the most creative people to be part of it. It is in collaborations, in conversations, in demonstrations of the virtues of design to non-designers, in building consensus on past accomplishments that visual phenomena obtain their meanings. The new media, which combine words and images and allow for an interactivity that has been unknown until recently, could fuel design communities and design institutions of unimaginably different kinds. But, without designers' willingness to publish the images that matter to them, to describe their methods and particularly their failures so that others can learn from them, even the

visual browsers of the future would be useless. I am suggesting that it is not pictures but people that can make design viable.

Perhaps the most critical difference between design and communication is that much of design seems to be stuck in a paradigm that has not changed much for the last century and no longer inspires the best people to want to be part of it. Part of the reason lies in the above. Let me explore some new beginnings.

In 1969, Herbert Simon wrote a remarkable proposal for *The Sciences of the Artificial*. It explored the *logic of making* rather than of describing things and contrasted the practices of engineers, architects and managers with those of traditional scientists. Although his proposal was informed largely by engineering, committed to an old positivism, and marred by a celebration of the kind of cognitivism that derived from his earlier work in artificial intelligence, it does contain the seeds of a new approach to design. It outlines a new logic of the design process. I am glad his name was mentioned several times in this conference but I dare to claim that his ideas have not permeated the thinking of designers, not even today. In fact, most of the conference participants I asked had not read his work.

Another writer whose name was mentioned, albeit in passing, is Donald Schön, who in 1983 gave us, among other books, *The Reflexive Practitioner*. Like Simon's proposal, it addresses issues of design quite generally, but unlike Simon's, it was no longer positivist and is modeled less on engineering decisions than on that of practical designers with a keen understanding of what they do to get where they want to be without adequate information.

In my view, both are attempts to liberate design from a concern for objects, images and aesthetics to processes of creating new things, from products that leave the factory to the practices that change the world intentionally. They describe a mindful way of being in design. Just like the move from journalism to communication, both redraw the boundary of design by embracing a variety of practical professions whose commonality was heretofore unrecognized, both describe processes of creating a desired but not yet existing world. I see these works as describing different dimensions of a shift in design thinking that is comparable to the one that gave birth to communication -- but this new paradigm needs to enter the discourse and practices of designers in order to have a comparable effect.

I myself have been encouraged along these lines by constructivist thinkers like Ernst von Glasersfeld, Paul Watzlawick, Wiebe E. Bijker, Peter L. Berger & Thomas Luckmann, by second-order cyberneticians Heinz von Foerster, Humberto Maturana, (and Gregory Bateson), by language theorists/philosophers Ludwig Wittgenstein, Benjamin Lee Whorf, Mikhail Bakhtin, and George Lakoff. Their works seem to converge on the idea that reality is socially constructed by processes in which design could see itself as a conscious participant. This idea goes back to the 18th century Italian administrator and philosopher Gambasttista Vico. Now, it has come back to provide a new philosophical ground for design.

Two years ago, the National Science Foundation (NSF) sponsored a conference on the future of design[1] at Raleigh, NC. With the intention to develop a national infrastructure for the coming information society, NSF missed designers' participation in creating this future. It wanted to learn from the invited participants what design could contribute to these technological developments and how NSF could help design to reorganize itself to become part of that future. These were fair but challenging questions. The deliberations resulted in a report that discussed future technologies, outlined new design principles for the next millenium, made recommendations on design education, and proposed a future research agenda for design. Regretfully, only very few designers have seen this blueprint for the future of design. Perhaps this conference could have gone far further had we been able to digest its proposals. Without a viable community, we are doomed to remain in the ritual of reinventing the wheel every time we meet.

The NSF report cited Herbert Simon but went beyond his work in understanding design not as composing technical artifacts, but as technologically intervening into the social fabric of their users. Let me list the suggestions made for a national research agenda in design:

- Support the systematic articulation and elaboration of a *(re)search paradigm* for design.
- Assist in the development of *a second-order science* of the artificial as a step toward creating truly human-centered technologies.
- Aid the elaboration of *a semantics* for (users' or stakeholders') interfacing with artifacts.
- Encourage *multi-disciplinarity*: networking design centers, developing collaborative designware, finding methods for involving stakeholders in design processes, enabling a future kind of electronic citizenship.
- Sponsor research to *reconceptualize "information"* interactively, dialogically, realistically and in reference to its users. Information should after all help redesigning the world.
- Reconceptualize technology in terms of the *coordination* it enables among users.
- Encourage the development and use of rigorous evaluative techniques for human-centered design.

This was suggested for NSF to sponsor, but it could also serve as an agenda that designers could embrace in order to create their own meaningful future: research projects, institutes, professional networks and advanced degree programs.

As the latest and possibly the most dramatic contribution towards the new paradigm, I have to mention the ongoing *semantic turn in design*. It responded to a new understanding that is emerging consequent to the fusion of computer and communication technologies. Reinhart Butter and I, in collaboration with several designers, educational institutions, and industries have worked for some time towards a human-centered design approach that takes the meaning, self-evidence and understanding of artifacts as its central concern. We call it "Product Semantics." From its early presentation in *Innovation*[2] and *Design Issues*[3], it has undergone several transformations and extensions. It has generated several conferences, the last one in February

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[1] K. Krippendorff (Ed.). *Design in the Age of Information; A report to NSF*. Design Research Laboratory, School of Design, North Carolina State University, Raleigh, NC 27695-7701, 1997. . http://repository.upenn.edu/asc_papers/96

[2] K. Krippendorff and R. Butter (Eds.) Product Semantics, (32 pages) *Innovations 3*,2 1984.

[3] K. Krippendorff and R. Butter (Eds.) Product Semantics, (140 pages) *Design Issues 5*,2, 1989.

1998[4]. It has been presented in several workshops all over the world, with courses on the subject taught at Ohio State University, the University of the Arts, Cranbrook Academy of Art as well as at the University of Salford, UK. A related approach to meaning has been developed at the Design School (HfG) Offenbach in Germany. Without semantics, interfacing with computers would be unthinkable. We explored and generalized what was learned from these and similar applications and found it extremely productive to design everyday things in terms of meaningful interfaces and claim that meaning is axiomatic to design. In concert with evaluative techniques that our concern for meaning rather than form or function makes available, design is developing an unprecedented rhetorical strength vis-a-vis older justifications and so-called harder disciplines. A book with the subtitle *A New Foundation for Design* is in press[5]. We consider this our contribution to the shifting paradigm in design.

Let me try to sketch some dimensions of the profound shift in design thinking we are observing:

From: product-oriented	to	**human-centered** approaches
focussing on surfaces and forms	to	addressing the **dynamics of interfaces**
talking of a typical end-user	to	acknowledging **diverse stakeholders**
perfecting functionality	to	affording the enactment of **multiple meanings**
theorizing a prescriptive aesthetics	to	developing relevant **user-conceptual models**
satisfying given specifications	to	being accountable for **intervening in an ecology** of artifacts
culturally insensitive designs	to	**culturally sensitive** designs (acknowledging different uses)
imposing rational goals	to	affirming users' **intrinsic motivation** (fun, flow, immersion)
designers' understanding	to	designers' **understanding of users' understanding**
relying on past scientific findings	to	creating future truths, arguable **paths toward viable futures**
assuming authority on end-products	to	assuming a constructive **role in a project** with stakeholders
general and unspecific knowledge	to	**expertise in cultures (meanings) of technology**.

I see these as clearly recognizable and powerful moves to a human-centered approach to design, an approach that puts the understanding of technology into the center of design concerns. These moves have been paved by numerous developments not just in technology but also by other cultural and philosophical paradigm shifts. They open spaces of unprecedented opportunities for design to unfold.

Five Propositions for Design (Education)

Instead of making concrete suggestions for a Ph.D. program in design, which I had intended, let me list five propositions that have guided my own explorations and would serve as my ground on which to construct intellectually rich graduate curricula in design:

1. *On the Axiomaticity of Meaning:* I think we have to realize that **artifacts cannot exist within a culture without being meaningful to someone** (their users, commentators, including designers). Meaning is central to human-centered design. The commitment to take meaning and

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[4] Part of the Proceedings of this conference are available on the Internet: http://semantics-in-design.hfg-gmuend.de
[5] *Die Semantische Wende; Eine Neue Grundlage für das Design*. Basel: Birkäuser Verlag (Planned for 2011)

understandability as primary target for design enables *designers* to claim *expertise in a domain of human experiences that no other profession has claimed for itself*. We have taken it as the conceptual foundation for an interactive semantics for design, product semantics, interface design, etc. Relying of an irrefutable and self-evident truth gives designers an unprecedented rhetorical strength in justifying design vis-à-vis all other professions. This proposition on meaning also enables designers and design educators to draw on the wealth of available anthropological, social psychological and linguistic knowledge.

2. *On its Reflexivity:* The users of technology are intelligent and understand their own world in their own way. New artifacts always intervene in that understanding**.** Under these conditions, **designers of new artifacts must understand the understanding users bring to a technology**. Designers' understanding of users understanding is an understanding of understanding, or a **second-order understanding**, which is fundamentally different from the kind of understanding the sciences encourage. The natural sciences, for example, assume that their object, nature, does not understand how it is being observed, investigated and used. Today, it would be unconscionable not to respect the reality of multiple and culturally diverse ways of understanding. Artifacts do not have the same meaning to everyone. Designers' understanding is necessarily different from users' understanding, but not therefore superior, right, or the only one that counts. Designers' commitment to a reflexive form of knowing would clearly distinguish them from engineers, for example. It is an exciting new form of knowing. In these terms, Simon's work is tied to a first-order understanding, not what is suggested here.

3. *On its Logic:* **To design is to search for or invent practical paths to viable futures**. The (inductive) logic of science is predicated on *re-search*, on a repeated search of past observational records for generalizable pattern that make the future more predictable and certain. The logic of design, in sharp contrast, is geared to alter a future by constructive actions. To this end, it needs to question existing beliefs in certainties, to find the sites where generalizations can be violated, or to overcome or undo conceptual barriers to thought and action. The logic of *making the unthinkable possible* is incompatible with the descriptive logic of science, as Simon already noted, or opposed teleologically. While scientific knowledge can aid design in areas where changes are unwanted, design is less interested in past truths but in creating future truths for others to be able to live with. Its aim is to compellingly articulate constructive actions. This calls for the development of methodologies that are design specific, not borrowed from scientific practice.

4. *On its Social Nature:* **Design is a project that can succeed only if it inspires stakeholders to actively support it**. As such a project, all design fundamentally is *a social activity*, one that is predicated on enlisting the collaboration of stakeholders, experts, clients, producers, promoters, opponents, and users and inviting them to assume responsibilities for parts of it. Designers are always but one part of a project, leading in what others may recognize as their strengths, but, unlike the prevailing myth, they are never entirely in charge of it. In any project, designers are *accountable* to its stakeholders for the particular paths they propose to pursue, for the methods used to create them, for their designs. Where people are involved, design processes can no longer be, cognitive, computational or mechanistic but social. Realizing the social nature of design calls for a social, political and cultural conception of the design process, which has to be part of responsible design education.

5. *On its Discursivity:* **Design discourse is the medium in which the four propositions reside and unfold into design practices**. Design discourse is not just talk. It is a process of languaging among designers in which meaning is a central concern, second-order understanding is common, different cultures are respected, possible futures and alternative paths to them are contemplated, diverse people can claim their stakes and negotiate their involvements, and knowledge accumulates[6]. Design discourse is not a theory of design but the very practical process of *designing and redesigning design*, a process that interrogates itself and can thus bootstrap design out of its own institutional confinements. This paper sought to do just this.

Design stays alive as long as its discourse continues and produces more livable futures for everyone. The development of a rich design discourse should be the foremost aim of graduate education, especially towards a Ph.D. in Design, whether it enlightens design practice, structures design curricula, or shapes institutions that can preserve it. Practicing designers may not have the resources to address these issues in ways design institutes or design schools can. However, if everyone contributes a small amount of their energy on "fertilizing the field," the harvest will prove to be a benefit to everyone. I am convinced that the emerging paradigm in design is on its way to reorganize design as powerfully as communication theory did when it transformed journalism into a new understanding of what humans do. A Ph.D. in Design could create the kind of practical thinkers that would give design the social status it deserves. However, it does not come on its own. It needs suitable institutional infrastructures and wholehearted commitments by practitioners "in the field."

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[6] Klaus Krippendorff (1995) Redesigning Design; An Invitation to a Responsible Future. Pages 138-162 in Päivi Tahkokallio and Susann Vihma (Eds.) *Design – Pleasure or Responsibility?* Helsinki: University of Art and Design. http://repository.upenn.edu/asc_papers/46