

1998

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Recommended Citation

Ehn, Pelle and Malmberg, Lone (1998) "The Design Challenge," *Scandinavian Journal of Information Systems*: Vol. 10 : Iss. 1 , Article 6.
Available at: <http://aisel.aisnet.org/sjis/vol10/iss1/6>

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The Design Challenge

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Introduction

We are surrounded by designed items. Items that are intended to make our lives more comfortable, more pleasant, and more beautiful. But what is design today? And what is the designer profession today? And what is the role of the designer in the so-called digital age? The picture is blurred. Until recently we had strong traditions in the different areas, like software design, graphic design, industrial design, fashion design etc. These traditions have defined contents, professions, and roles quite explicitly. In the postmodern society we experience how traditions and limits dissolve, and how new media and digital technology transform former design processes into new ways of working and constituting design.

Digital technology is probably the most important reason for the blurred de-

sign profession. First it has changed the existing design traditions radically as mentioned above, and secondly it has created new design professions. Digital technology is part of many of the designed artifacts we live with. This development challenges the existing design professions and creates new professions. Until recently software was considered as something developed by engineers, but today it is widely acknowledged that software also has to be designed.

This movement from software engineering to design of computer artifacts makes the creation of software and existing design traditions converge.

This movement and the blurring of the boundaries do also influence the Scandinavian approach to systems development—whatever this is today or in the future.

1. Design theory: from functionality to design ability

"The proper study of mankind is the science of design, not only as the professional component of a technical education but as a core discipline for every liberally educated man". (Simon 1969, p. 83)

This bold assertion from Herbert Simon's famous design manifesto "The Sciences of the Artificial" suggests that all practitioners, because they produce artifacts of one kind or another are designers. This view of design as a general human activity was shared by Donald Schön another of the design theory legends, who in "The Reflective Practitioner" put our attention to how professionals think in action (Schön 1983). However, sharing perspective on the importance of design, they totally disagreed on what designers do when they design. Simon's view was instrumental focusing on heuristic search within a field of constraints. Schön's view was communicative focusing on *design ability*, how designers 'reflect-in-action' and have 'conversation-with-the-material'.

Both theoretical views, different and contradictory as they are, have had strong theoretical impact on our understanding of the relation between design and systems development, participatory design and information systems research in Scandinavia (see e.g. Dahlbom and Mathiassen 1993, Ehn 1988 and Löwgrén and Stolterman 1998).

Internationally there is a similar trend towards understanding our discipline as one of design. "Bringing Design to Software" edited by Terry Winograd is a manifestation of this trend. Design of computer artifacts is here understood as

an activity that is conscious, is a conversation with the material, is creative, is communication, and is a social activity that keep human concerns in the center and has social consequences (Winograd 1996). Interestingly, in engineering proper, there is a parallel move away from understanding engineering design as less instrumental and more as a historically situated social process that is full of uncertainty and ambiguity (see e.g. Buccarelli 1996).

Hence, the kind of support to expect from design theory is not so much in terms of 'scientific theories' for prediction of results of an activity independent of context and situation, but rather support for reflections about conditions for changed human activity. Such 'design theories' are rather practical instruments to support the designer as a reflective practitioner to improve his or her competence to make ethic and aesthetic judgments that are appropriate in their context.

2. The contextual challenge - from work to everyday activity

"When it is written, the history of computers will, I believe, be quite simple. In the beginning was the computer. Then it disappeared. Of course, it didn't go away completely. It just dissolved. Either it became part of the physical background. Forming part of ordinary objects such as tables, chairs, walls, and desks. Or it became part of the social background, providing just another part of the context of work." John Seely Brown (1996, p. 30).

From being experts' and business' tools we now see computers as integrated into our daily life in almost all respects.

Not only in our professional work processes but also in our homes. Digital design is embedded in many of the artifacts we are surrounded by. All our household machinery is operated via embedded microprocessors enabling us to perform advanced operations. Our cars are also operated by advanced digital design, and our digital telephones allow us to use them for a lot more than just simple telephone calls. Even our children's toys contain lots of digital components. Ubiquitous computing is the term which describes the ultimate consequence on 'the computer is everywhere'-position. Mark Weiser (1993) originally coined this as a technology that *integrate information displays into the everyday physical world, and envisions computation primarily in the background where it may not even be noticed*. All these new applications of digital technology have created a situation where we see development of computer artifacts as a merge of industrial (material) design and software (virtual) design.

The characteristics of computer artifacts as embedded into our daily lives and merging material and virtual design give new challenges and life to the Scandinavian design tradition. The Scandinavian design tradition evolved from a trade union perspective as an idea about professional resources in working life. User participation included different professions and work processes. The embeddedness of computer artifacts in our daily life challenges the idea of user participation, since we now not just need to include professionals but also need to let elderly people, computer novices, and children participate in the design process. And we do not only need to look at professional work processes, but also at

the fuzzy zone between professional life and private life, life styles in the post-modern society, homes, means of transportation, cultural activities etc. All this makes the idea of user participation complex to handle, since the subject we are dealing with tend to dissolve. The 'established' participatory design tradition in Scandinavia is focused on work place and work processes, but newer traditions evolving from ethnography and social science seem to have a potential as a framework for understanding and designing computer artifacts in a wider context than work processes in professional environments. Lucy Suchman (1987) introduced the use of ethnomethodology in the area of human-machine communication in her *Plans and situated actions*, and in their contextual design methodology Simonsen and Kensing (1997) try to develop the Scandinavian traditions for participatory design by embedding ethnography as important part of the overall design activities.

This ethnomethodological approach for understanding human activities and the social organization of these, together with a Scandinavian idea of user participation and quality in design need to be carried out in new application areas and in new ways of using digital technology in non-professional communities, in order to find out whether the Scandinavian approach will still be an appropriate approach to design of computer artifacts for our daily life?

3. The aesthetic challenge - from politics to design

If not before, it is now when computers are becoming integral parts of our every-

day environment, obvious that the design of computer artifacts has to converge with design in other design fields like architecture, industrial design and graphic design. In fact, as mentioned above, there already exists an interdisciplinary design community in the field of design theory and design methods, a theoretical community with significant contributions also from the field of designing computer artifacts in the tradition of Simon and Schön (Cross 1984, Ehn 1988).

However, when we compare design in our field with the 'classical' design traditions there are also major differences. One such difference is the focus on 'aesthetic' craft competence both with regard to the shaping of materials in a product and with regard to models, sketches and other visualizations in the design process. In a context where computers are everywhere the tradition of Scandinavian systems development will perform poorly if not enhanced with 'aesthetic craft competence' as fostered in architecture, graphic design and industrial design.

Another difference has to do with how, in the traditional design disciplines, professional design competence rests upon knowledge of exemplars, traditions, epochs, and styles like classicism, functionalism, modernism, and post modernism. This is a major and promising, but also difficult, design challenge for our own field as preliminary research indicates (e.g. Winograd 1996, Ehn et al. 1997, Löwgren and Stolterman 1998). Is the future of Scandinavian systems development a merge with Scandinavian design, the once so successful modern tradition in architecture and industrial design? Or do we have to look for com-

pletely new exemplars in our postmodern information society?

Another aesthetic challenge has to do with the convergence between information technology and other media. Systems development competence must in digital design cooperate with and learn from narrative and administrative competence in film, television, theatre, dance, music, literature, etc. This is an aesthetic challenge to develop appropriate 'new media design processes' as well as to broaden the field of systems development to also include media products and services like multimedia games and interactive television. Rather than thinking in roles and competencies like programmers, systems developers and users we must now in design of computer artifacts also think in terms of directors, creative producers and audience.

This brings us to the fundamental aesthetic question of the role of art in design of computer artifacts and information technology. It is interesting to notice that artists experimenting with new media technology often are at the absolute frontier of design research exploring e.g. new forms of human computer interaction and new ways of experiencing our virtual and material reality (see e.g. Sommer and Mignonneau 1998, Mealing 1997). Hence, it is not surprising that leading new media research centers have artist-in-residence programs. Here the role of the artist seems to be as inspiration and challenge for research and technological development.

In relation to this question it is interesting to notice how the designer has taken over the old role of the artist as creator of artifacts that are 'beautiful' or 'aesthetically pleasing' whereas artists using new media are more occupied with cri-

tique and with experiences by which we can explore fundamental questions of our human existence moving away from an aesthetics of 'beauty' towards e.g. an aesthetics of 'interference' in our hypercomplex postmodern society (Qvortrup 1999).

4. What's next - Digital Bauhaus or hypercomplex interference

4.1. *Where are we today in education and research*

How are these challenges to the Scandinavian approach to systems development met by education and research programs in Scandinavia?

At many Scandinavian locations we see new research and education institutions growing out of the existing institutions or even being established as new institutions. Many of these initiatives are shaped by unification of understanding information technology in a wide variety of contexts and from an aesthetic position.

There are interesting examples of this unification outside Scandinavia; like in ZKM in Germany, Computer Related Design at Royal College of Art in London and at Interactive Telecommunication Program, Tisch School of the Arts in New York and other institutions in US. In Scandinavia it is especially interesting to see if and how this unification of a 'context' and 'aesthetic' orientation is related to traditions for user-participation, democracy and workplace perspective. In fact, in the area of education we see several initiatives on this unification in the whole Scandinavia.¹

During the last couple of years we have seen an increased funding of information technology research on the 'edge' of the classical information technology, computer science and information systems traditions. We can observe huge national research programs which not only include technical research issues and competencies but also include researchers from media science, classical design professions and art. Also industrial partners seem to acknowledge this multidisciplinary approach to design of information technology by supporting these research initiatives in different ways. Several examples of research initiatives in Scandinavia, which takes this unified approach to understanding and design of digital technology can be found.²

What seems to characterize and distinguish these education and research initiatives is—most explicitly stated in the Swedish initiative—a consequent focus on the *relevance* of the technology for communities and society. There might be a movement away from a strong and pure workplace and democracy perspective, but we still notice a focus on relevance for society in large.

So, what's next? In what direction do these initiatives point, and where do we go, given these challenges and the suggested moves away from a Scandinavian approach focusing on functionality, work and politics?

4.2. *A Digital Bauhaus ...*

One possibility would be to stick to the design of computer artifacts in the tradition of the modern Enlightenment project and the attempt to unite the two sides of this humanistic project: the hard (technology and natural sciences) with

the soft (values, democracy, art and ethics). This is especially interesting since information technology in itself transcends the borders between the 'soft' and the 'hard' and software inherently become codes of values, aesthetic ideals, ethics and politics.

In the history of modern society several grand projects have been launched in this tradition. One such remarkable project was Bauhaus, the famous German design school from the 1920th. Today, in the digital age we can witness new more post-modern attempts to meetings between 'art' and 'technology' in what with varying interpretations has been referred to as a 'third culture'. The concept was formulated by C.P. Snow (1959) in an analysis of the division of the two cultures of the art/humanities and the science/technology and Snow pleaded for reorganization of education and the social system, for a 'third culture' where the two could meet. Since the analysis that Snow made forty years ago there have been interesting changes and different authors have seen new possibilities for a third culture to emerge. The debate was started again in Brockman (1995), where he argued that a number of scientists now had left the ivory tower and engaged them selves and their scientific knowledge in public discourse about fundamental questions about the meaning of our lives. And still others like the science journalist Tor Nørretranders has recognized the grand potential if artists and scientists were to collaborate.

Hence, for this third culture to flourish and further develop the Scandinavian tradition for design of computer artifacts it would be necessary to create arenas and meeting places for creative and so-

cially useful meetings between 'art' and 'technology'.

This is the position taken in *Manifesto for a Digital Bauhaus* (Ehn 1998) in which it is suggested that:

"What is needed in design and use of the most post-modern media and technologies - the information and communication technology - is not a modernism caught in a solidified objectivity in the design of modern objects in steel, glass and concrete, but a comprehensive sensuality in the design of meaningful interactive and virtual stories and environments.

What is needed is not the modern praise of new technology, but a critical and creative aesthetic-technical production orientation that unites modern information and communication technology with design, art, culture and society, and at the same time places the development of the new mediating technologies in their real every day context of changes in lifestyle, work and leisure.

What is needed in the development of the aesthetics of the information and communication technology society is:

- a Scandinavian design that unites a democratic perspective emphasizing open dialogue and active user participation,
- with the development of edifying cultural experiences and the production of useful, interesting, functional and maybe even beautiful and amusing every day things for ordinary people.

What is needed is humanistic and user-oriented education and research that will develop both a critical stance to information and communication technology, and at the same time competence to design, compose, and tell stories using the new mediating technologies.

What is needed are meetings between:

- constructive knowledge and competence related to interactive and communicative possibilities and constraints when using the new mediating technologies,
- aesthetic knowledge and competence from fields like television, theatre, film, music, literature, architecture, art and design, and
- analytical-critical knowledge and competence from philosophy, social science, and not least cultural and media studies.

(...)

What is needed is an international network for creative and socially useful digital Bauhaus design that embraces, penetrates and unites art, science, and technology and that influences research, study and work - a third culture in the digital age at the door to the twenty-first century and a new millennium.

Digital Bauhaus designers of all countries, unite!"

4.3. ... or hypercomplex interference?

This Digital Bauhaus approach might however be a too modernistic and too anthropocentric approach. More radical than this 'third culture' approach would of course be to view the changing conditions for the Scandinavian tradition as an expression of even more fundamental social changes from the modern society into an emerging hypercomplex society (Qvortrup 1998). Lars Qvortrup sees this change as a transgression from an anthropocentric modern society to a polycentric hypercomplex society. This hypercomplex society does not offer one single point of observation in the meeting between art and technology, but a number of mutually competing observa-

tion points with each their own social context. In this perspective the future of Scandinavian systems development would not be in a project in the modern tradition of the great Enlightenment project, but rather in a project for creating arenas for interesting but unpredictable interference between humans as well as non-humans.

Cyborgs in all positions, interfere!

Notes

¹For further details see <http://www.multimedia.aau.dk/>, http://www.kk.mah.se/utb_en.htm, <http://www.mlab.uiah.fi/2studies/22.html#about>, <http://www.uv.uio.no/intermedia/>

²For further details see <http://www.uiah.fi/lume/>, <http://www.intermedia.uni.dk/>, <http://www.stratresearch.se/tii.doc>, <http://www.uv.uio.no/intermedia/>

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