The role of art and design in it-education at the digital Bauhaus

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ABSTRACT: In this paper, I discuss experiences from the interaction technology education program at Arts and communication – the digital Bauhaus – Malmö university. Focus is put on how the education program is oriented towards a combination of material artifacts with digital media, and on which role art and design play in this combination.

KEYWORDS: art, design, digital electronics, education design, interaction design, interaction technology, material artifacts.

K3 – A DIGITAL BAUHAUS
Malmö University started its first education programs in the autumn 1998. The university is situated in a former harbor area in a city with strong industrial traditions. One main characteristic of the university is collaboration across traditional subjects and faculty boundaries. Arts and Communication (in short K3 for Konst, kultur och kommunikation in Swedish) is one of six areas of education and research. This new pioneering site gathers teachers and researchers with a mixed background including computer science, informatics, electrical engineering, interaction design, industrial design, architecture, game design, media studies, music, film and visual art. It is deliberately shaped as a melting pot for research and education in art and technology, with an interdisciplinary design orientation and a strong focus on information technology and digital media.

There are undergraduate programs in Interaction Technology, Physical and Virtual Design, Media and Communication Studies, Performing Arts Technology. There are also graduate-level programs for Interaction Design and for Creative Producers, and a doctorate program in Interaction Design. Today the School of Arts and Communication has about 700 students and some 50 faculty members. Research is organised in interdisciplinary and design-oriented studios and focuses on narrativity and communication, space and virtuality, and creative environments and learning. Research is carried out in close co-operation with the education programs, the industry, and cultural organizations in the surrounding society. K3 is founded on a vision about a Digital Bauhaus:

In the history of modern society several grand projects have been launched in an attempt to unite the two sides of the Enlightenment project: the hard (technology and natural sciences) with the soft (values, democracy, art and ethics). One remarkable such project was the Bauhaus. It was a great modern success story, but also a failure. Today, in the digital age we can witness new more post-modern attempts to meeting between ‘art’ and ‘technology’. This emerging ‘third culture’ of nerds and digerati is promising, but still most immature. [1]

The original Bauhaus project in the 1920’s was a democratic failure diminished to an elitist program. A contemporary Swedish philosopher comments on the Enlightenment project that the ‘hard’ natural science-based technological expectations of the humanistic Enlightenment project of modern society have been more than fulfilled during the last centuries. In contrast the more ‘soft’ expectations of the Enlightenment project concerning values, art, aesthetic ideals, ethics and politics have in no way been met. [6]

With this combination of disciplines and this political vision we have created an arena, a meeting place, a school, and a research center for creative and socially useful meetings between ‘art’ and ‘technology’ at K3, where democratic ideals as well as uniting ‘hard’ and ‘soft’ values are important corner stones of all research and education activities.

Figure 1: K3 – the Digital Bauhaus

THE INTERACTION DESIGN AREA
The movement from software engineering to design of computer artifacts makes the creation of software and existing design traditions converge [2, 7]. Terry Winograd’s book ‘Bringing design to software’ [12] has had a remarkable influence on the software design area. One noteworthy influence is coining the research and education area ‘interaction design’. This new design discipline is born from a convergence between the traditional design fields (graphic design and industrial design) and socially oriented computer studies (human-computer interaction, computer supported cooperative work and participatory design). Other influencing disciplines have been architecture, art, sociology and
Interaction design is underlying the curriculum for several education programs at K3. One of these – Interaction technology – will be discussed in the following. In short it could be described as a BA-level education program with a strong focus on interaction design and new interaction technologies.

In addition to conventional software design programs the challenge is to extend the perception of software design to also include:

- combination of the physical and the digital
- an art and design perspective when designing innovative interaction technologies
- augmented environments / ubiquitous computing

The terms ‘interaction’ and ‘interactive’ are important in this context. One useful way to understand what interactive digital technology is, is to understand systems as texts, which – when they are interactive – are non-sequential and responsive. Another possible way of understanding ‘interaction’ and ‘interactive’ is to consider appearances of interactive digital technology as both spatial and temporal as suggested by Redström [9].

As mentioned earlier Winograd’s “Bringing design to software” [12] opened up the discussion about the role of the design discipline in the area of development of software. Today software is embedded in several products that are designed in more traditional design areas like industrial design and architecture.

We use artefacts augmented by digital technology in all aspects of our everyday life and working life. This calls for the same requirement for innovative thinking when designing digital systems as when designing physical artefacts. These developments mean that software designers will need to focus more on the affective dimensions of human response. They need to learn from other human communication media, and adapt principles and techniques from filmmakers, musicians, visual artists, and other designers, which in broad are called the arts [5]. Winograd [12] claims that “designing for the full range of human experience may well be the theme for the next generation of discourse about software design.” (xix).

The issue could also be turned around, and instead we could ask how computational technology can contribute to design and art, by augmenting objects and our environments. It is exactly in this field on the border between digital technology on one side and art and design on the other, that the it-program meet its most important challenges.

COMBINING THE PHYSICAL AND THE DIGITAL
In order to bring design to software – and especially software to design – a stronger focus should be put on the physical design material. The interaction technology designer should design for use of more senses in interaction with computers, since computers are an integrated part of our environment and of the everyday artefacts we use. This requires us to move beyond screen, keyboard and mouse as primary interaction devices.

At the interaction technology program there is a strong commitment and orientation towards these ideas. In order to involve more senses in design of interaction, students get an introduction to digital electronics, input / output formats and a wide variety of communication protocols besides a thorough knowledge about interaction design, interactive narratives, software design and programming. But they also experiment in using all sorts of physical modeling material as a way of innovative thinking, and as a way to understand computers as part of designed physical objects and designed (augmented) environments as the examples later in this paper will illustrate.

In the game industry we see a wide variety of new game controls using force feedback, gestures etc. Also games that move away from the box, like Lego-robot games etc are based on integrating software design with material layout and instead focus on the environment, which the games are played in.

We believe that innovative digital interaction styles should not only grow out of experimenting with the digital material, but also from experimenting with new material gestalts. Or as Donald Schön has coined it: design is a conversation with materials [10]. When working with innovative physical expressions, methods from art and design are useful since it is no longer just a question of optimizing performance, but also about creating affective and aesthetical attractive interaction with the interactive digital technology.

AN ART AND DESIGN PERSPECTIVE
Incorporating an art and design perspective when designing software has been crucial at the interaction technology program. The design perspective has been accepted and implemented in still more environments during the last couple of years with strong inspiration from other forms of design. Some prominent examples are Interaction Design at Ivrea in Italy, Interaction Design at Royal College of Art in London (which actually changed name from Computer Related Design), and our own Interaction Design program in Malmö. These are all acknowledgements of the importance of a design perspective on software.

It is often questioned what an art and design perspective means at all. The Danish School of Design defines design as art with a purpose. In this context a design perspective means that we put a strong focus on use-qualities and use-contexts. An art perspective means that the artefacts or environments we design, also aims to be aesthetically pleasurable in use. Not only from a visual perspective, but also in the interaction as a whole.
Recently even Don Norman [8] who traditionally has a more HCI-oriented view acknowledged the important role of design.

While the role of design has been accepted even in rather conventional IT and media industries the role of art in software design is considered exclusive and quite esoteric. We believe that the use of IT should also be an aesthetic experience in a very wide sense. As mentioned above it does not only refer to the graphical expression, but also to the narrative structure, the interaction, the spatial context and the interplay between the physical and digital design. Or as the Danish designer Per Mollerup puts it [3]:

Thus design consists of form and usefulness; this also means that good design is design that fulfills its purpose well. On the other hand the purpose does not necessarily need to be functionalistic; it can as well be aesthetical, economical, environmental, or moral.

AUGMENTED ENVIRONMENTS
A third important area to focus on is how to get the computer ‘out of the box’ and into our environment. Research programs like ‘the disappearing computer’ and concepts like ‘ubiquitous computing’ [11] are important directions for many projects made during the education program. To focus on bringing the computer out of the box also means to devote more attention towards the intrinsic interplay between architecture / space, digital technology and human activities taking place in this environment. Further it gives us better possibilities for using all our senses in interaction with the digital artefact when we are not tied to the desk. Sensors make it possible to use our kinesthetic sense to interact. New output devices make it possible to sense and react to tactile or smell-based forms of interaction.

Interdisciplinarity
Another essential factor in reaching an interesting and well functioning interaction design by this combination of the physical and the digital and in creating augmented environments is the strong interdisciplinary cooperation with other education programs. The Physical and virtual design program is build on a strong design praxis which gives the students abilities and competencies in making physical prototypes as well as concepts for space design, which complement the interaction technology competencies in an excellent way. Most of the Interaction technology education is based on problem-based learning (PBL) and consists of projects of which many are integrated with other education programs or at least draw on the existing competencies at the other education programs and in the environment.

SOME EXAMPLES
In the following I present some example projects made at the interaction technology education program. Through these examples I will illustrate the role and necessity of an art and design perspective when working with innovative digital interaction technology.

The Silver Fox
This project was made during a project on the theme peripheral awareness in which the students were asked to address this issue and the same time avoid use of traditional I/O devices like keyboard, mouse and screen.

The idea was to create awareness in the students project room about ‘coffee-time’ (time for chat, time for fun) in the cafe, which is physically distant from the project room. One group of students built a sculpture of a giant fox which – based on the frequency of the numbers of lift of the coffee pot in the cafe – started to spy out coffee-smelling steam from its nose, and got yellow blinking eyes. An interesting use of a combination of senses like smell and sight to become aware of social activities.

Figure 2: The silver fox

While a traditional software design solution would have focused on functionalistic qualities, these students took their part of departure in an old saying from Northern Sweden – ‘when it is foggy outside, the fox is making coffee’ – built a sculpture, and used smell as the main output device. This requires an imagination and an ability to transfer this into a physical expression. Competencies that we normally connect to the ability to design (as opposed to engineer).

Kammaren
Kammaren (meaning approximately chamber, small room in Swedish) aims at finding a model for a showroom for artefacts and projects produced at K3, Malmö University. The concept is supposed to give support to documentation of design processes and at the same time offer a meeting-place for inspirational material outside of project borders. That’s the perspective of Kammaren as a designer’s tool. The students focused on developing a concept of Kammaren as a space/show-room with a physical interface.

Their aim was to create an augmented environment with possibilities to support all senses. They came up with a design concept in which they had identified five components – the game board, the kiosk, the palette, the
interactive wall and the pick and drop pen – with different functions.

Also in this project the affective qualities of the interaction were stressed rather than designing for effectiveness or clear functionality. The prototype was made by experimenting in different physical materials and tried out by scenarios representing inspirational learning processes.

Rather than focusing on a full functional prototype the students’ digital competencies enable them to imagine possibilities given by potential of the digital material and to express use-situations (e.g. short animations, video-clips etc), which can illustrate their design ideas.

Shimadzu
In this project the students combined mechatronics, biological organisms, and digital technology. The idea was to create a physical game or battle platform for letting a battle between the ‘new economy’ and ‘the primitive nature’ take place. In order to do this they constructed a carriage (hidden under the surface of the battle platform) with a little human-like character on top whose movement was controlled by the values from two different input sources.

One was a web-based search engine searching for terminology associated the ‘new economy’. The other was values indicating the growth of a (living!) yeast culture (the ‘primitive nature’), which could be stimulated by feeding the yeast culture with sugar, and measured by an oscilloscope. This is an excellent example of letting design material talk back and create new forms of aesthetic interactions. In this case the students had an idea about a living interface which fast became the basic idea for their interactive design as a whole.

DESIGNING A SPACE FOR INTERACTION
As these examples illustrate the students manage to include several senses, different physical and digital materials as well as the environment in their approach to interaction design. I believe that there is strong need for bringing our interaction with the environment (digital or not) back to the use of all our senses including our kinesthetic sense [4]. The way we learn, reason, remember, associate and get inspiration is strongly dependent of the use of our body and all our senses. This requires a design approach, focusing on the ability to imagine new ways of using – interacting with – digital representations, focusing on the whole space for interaction between humans mediated by digital technology.
REFERENCES

ENDNOTES
1 http://www.k3.mah.se/mani_en.htm (last accessed: 2003-02-01)
2 A EU-research program oriented towards development of environments where the digital augmentation disappears into / becomes transparent in the environment or the artefact.