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The Dual Natures of Design

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Introduction

In my PhD I wish to investigate aspects of interaction design in relation to the appearance and context of dual-natured design objects, meaning artifacts with physical form and digital behavior. In interaction design of today there is a focus on isolated artifacts that does not simultaneously involve the physical and digital context in the sense that it is a vital part of its design and expression.

Today, with Weiser's future scenario of ubiquitous computing a reality, when the design paradigm has shifted towards a theory and practice of physical interaction with digital materials, it has become time to take the next step, to take respect to the dependency of those design objects to their context. The context can be described as the combination of the social fabric and the physical location where the object will be placed. The design object is the outcome of the interaction designer's work, a mixture between aesthetically valuable artifact and service, dependant to a certain extent on existing infrastructures. The potential connection among dual-natured artifacts should also be informed by means of spatial/physical aspects as well as the digital ones, and remain in control by humans. With our devices we are dependant on the existence of other users and infrastructures interacting at the same level and with the same tools, and therefore we should design for dependency.

Information technology is central within the field of interaction design, and it can be viewed as a material for design. As design material it is both software and hardware, allowing communication, as well as adaptation to new conditions. However, it is not sufficient for successful interaction design on



Figure 1. Missing Link – Designing for Dependency; a workshop-method for design of components that is to be a part of a larger system. This workshop deals with interaction design both from a digital and a physical perspective.



Figure 2. Mixed Marked Plazas: How personal devices support social interaction and sharing of digital materials, by simultaneous co-located multi-user interaction on shared public displays, a new approach to how technology can change the way we use the public space.

its own, other materials are needed as well, primarily physical, but also more abstract things such as ideas, economy, etc. In my specific project, I wish to apply views and ideas from architecture in addition to interaction design. Architecture is about organizing social relations by means of spatial layout, the control of natural phenomena such as light, temperature etc. It is about facilitating people in being together and enabling them to separate into groups when this is preferable. Most basically architecture consists of places to stay still and areas for movement and traffic. Through the awareness on these spatial concepts we can start exploiting existing places in the context e.g. suitable for co-location or try to establish new areas for absorption by combining physical means with technological properties. By focusing on and understanding information technology together with spatial properties and boundaries as design materials we appreciate a great part of what is already in the context, however the nature of a design material is its ability to take up new forms or relate to other materials in new ways shifting its initial function.

An approach to this methodology could be to design and develop components that work within the rules of an overall system interface. Meaning, each component is supposed to work on its own and at the same time be able to be a part of a full scale system, in which it reacts to the other and totally different components of the system. Sometimes the larger system is a software system and sometimes it is physical and tangible. The work will be discussed based on the idea about the importance of designing for dependency, meaning artifacts that are dependant on in what way they are connected to the environment and to other artifacts. They have inputs from the users and outputs to the world, inputs from other systems/infrastructures and outputs to those. They act as transceivers, retrieval servers, information sources, or data black holes. They are not simply self-contained things, but must contain mechanisms allowing them to consider and ability

to take advantage of other objects to greater extent than today.

Background

I got my M.Sc. in Interaction Design in 2004 from Chalmers University of Technology. I worked as a research assistant at the Center for Interactive Spaces at the University of Aarhus from January 2004 until I started my Ph.D.-studies in September 2005, at Chalmers University of Technology, Göteborg. I am still working in close cooperation with the University of Aarhus and the Aarhus School of Architecture.

Project/problem statement

- How should dual-natured interaction be defined in relation to designers, designs and users?
- Do existing approaches to design, engineering and software development tend to focus on either the physical or the computational aspects in the design process?
- If so, how can we change the development cycle so that both the physical and computational aspects are considered equally important, simultaneously?
- How can the physical and computational aspects of electronic artefacts be considered so equally important that they feed into and become dependent on each other in design?
- How can the physical and digital context be considered as a vital part of the design of an electronic artefact?
- What understanding of the dual nature of electronic objects already exists among today's designers?
- What tools and methods are suitable for understanding and designing dependency of the physical and digital aspects of the object to its context?
- If the digital and physical aspects of electronic objects and its contexts are considered equally important in design what will be the result?

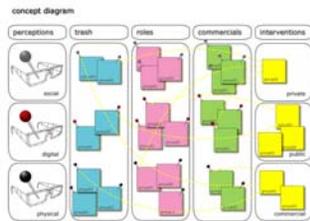


Figure 3. Bthere or be Square: A Method for Extreme Contextualization of Design. A method for dividing the context in different layers, and from different perspectives (social, digital, physical), reveal hidden structures in the inhabitant's everyday life and the environment among them, meaning a full scale context and user study to use as background material for brainstorming and design choices.

Past and future

I have published papers in various projects so far, and I also have several submitted papers. As I will go into the phase of writing for the Licentiate-thesis this spring, I will probably re-define my research questions several times. The Licentiate-thesis will be grounded in previous work, while the final Doctoral-thesis will be based on new findings. I am now in the process of taking several courses, finalizing one project, developing a second project, and starting up a third project. These projects will be examples in my overall PhD-project.

Approach or Method

The methods I will base my work on will vary for different stages in the project phases. There will for instance be experimental prototyping, literature studies, user studies, multi-method evaluations, own developed methods as for instance Bthere or Mission from Mars, and more.

Expected results from the PhD

The goal for this PhD project is to develop and explore new concepts and methods that can contribute to the field of Interaction Design. I wish to work towards a greater understanding for the design potential with the highly complex dual-natured elements and to create a framework for this.

Published articles

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