

Interacting with the Disappeared Computer

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ABSTRACT

This paper describes an approach based on the decoupling of devices, functionality and the user interface, proposing a generic interface and mapping of real-world elements with the virtual world. The research project looks at interfaces for our technological environment in general, which can be called the electronic ecology or *e-cology*

1. INTRODUCTION

Due to the tendencies of increased networking and the continuing miniaturisation, the desktop computer is disappearing. In some situations (for instance when mobile) the computer has disappeared already. The physical presence of the appliance has shrunk to a point where all that remains is the *human interface*, or even beyond that point.....

1.1 The Computer has Disappeared, Now what?

The danger is, as we have seen with other technologies in the past that have been miniaturised away, that when the computer disappears also the interface will disappear. The field of HCI research can take this as an opportunity. After all, the interface technology is extremely malleable and interfaces can be shaped taking the human (in)capabilities (both physically as well as mentally) as a starting point rather than the technology. Form follows function, not the technology - more than ever because the computer technology has virtually disappeared. It is sometimes said that the ideal interface has to be invisible (or disappeared?), but this is mainly a sentiment that stems from the frustration caused by interfaces that are badly designed (if at all) and are seemingly getting in the way. Generally computers do not do what the user wants, but what the engineers and designers *think* the users wants, or what the engineers and designers *want* the users to want. When the computer becomes ubiquitous the danger is that this misunderstanding also becomes ubiquitous. The need for a solid and understandable interface for ubiquitous computing is bigger than ever.

1.2 The Ubiquitous Interface

A spatial interface, such as used in what I call Interactivated Spaces, is a way of searching for solutions for the problem of how to control an invisible, ubiquitous system. Such an interface can be a combination of speech recognition, gestural control, and tangible interaction elements that are placed in the space or worn by the user.

1.3 A shift in thinking: from devices to functions

For several years there has been a tendency in technological developments towards the disappearance of devices, the functions of which are then incorporated in the remaining appliances.

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These resulting multifunctional appliances are therefore harder to operate. The tendency of the increased networking of appliances results in functions disappearing into the network. An example of this is the "voice mail box", storing messages somewhere in the network instead of on a tape or chip in an answering machine in the home. This has certain advantages, but the problematic issue is that the *interface* of the old answering machine, which gave access to the functionality of voice mail, has disappeared. Now, the functionality needs to be operated with an interface that was never designed for this - "to delete this message, press 5". This results in cumbersome switching between modes and modalities, instead of just having a "delete" button at hand.

The research project is making an analysis of this technological environment based on functionalities rather than based on the devices (which change and often have disappeared). This research attempts to separate functionality and technology.

1.4 The Generic Interface

Approaching our technological environment as outlined above, it becomes possible to create an overview of functionalities (whether in devices or in virtual, networked environments) and interfaces. The interface usually affords a two-way interaction: it has an input channel (buttons, dials) and an output channel (displays). A number of 'medium-independent' functions can be identified which are applicable to all sorts of content: for instance a "play" button that activates a message in a voice mail functionality, or plays music track in a CD playing functionality. In the design of the generic interface some medium-specific controls need to be implementable too. The generic interface is a contrast with the present situation. Currently, one may be walking around with a mobile telephone (interface: a few buttons, small display), a PDA (very few buttons, pen input, larger display), a laptop computer (trackpad, keyboard, even larger screen), a walkman or CD player (buttons, dials, headphones), a watch (tiny buttons, small display), et cetera. It is clear that there is a lot of overlap in the interfaces, which is the tradition. The strong point of this is, as seen from the user, that there is a fixed *mapping* between interface elements and functionality. When devices disappear, and a generic interface remains, this mapping needs to be designed and built in a different way, without losing the clarity and transparency.

1.5 Mapping of functionalities and interfaces

The focus of the research is on the development and testing of interfaces and interaction styles that link the functionality, content and control (mapping). Part of the approach is based on using real world objects, their (virtual) affordances and beacons, gesturally by pointing and linking. Objects and processes that are outside the field of view can be represented by icons, metaphors and maps. The articulations in this gestural input will be supported by a rich, multimodal feedback.