

DESIGNING MIXED-MEDIA-DEVICES FOR SUPPORT OF HEALTHCARE PROFESSIONALS

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Computational technologies are becoming increasingly embedded in our everyday environments. Modern cars coming straight from the assembly line contain more microprocessors than the first Airbus passenger planes. Soon, microprocessors in our everyday devices will connect to wireless networks and the everyday devices we use will be connectable to other devices and services in novel ways. A device without display may use a TV screen nearby to display data, or a camera may use a GPS in the vicinity to attach location data to the photograph. In the dissertation, these emerging devices with multifunctional properties are termed Mixed-Media-Devices, due to their heterogeneous nature.

However, if Mixed-Media-Devices are to connect with each other, there must be an underlying software architecture to support the heterogeneity. Furthermore, the software architecture must be “open” for the developers, so devices from one developer can connect to other devices from other developers. The aim of the EU funded research project “Palcom” has been to provide new software architecture for ubiquitous computing. In other words, to provide the software necessary to orchestrate the emerging Mixed-Media- Devices in our environment. The work in this dissertation has been done within the frame of the Palcom project.

The computer science department at Aarhus University coordinates the Palcom project. The computer science department in Aarhus has a profound experience in involving users in the design process to ensure that the developed technology complies with the skills, knowledge and experience of the people who use it. To provide real life input for the software architecture, the Palcom project has worked with a range of application areas within healthcare such as Emergency Response,

Pregnancy and Maternity, Hand Surgery and a Neonatal Intensive Care Unit. Together with the users, a range of Mixed-Media-Devices have been developed within the application areas to inform and try out the developed software architecture.

While the Palcom project has aimed at providing a new software architecture for ubiquitous computing, my research has focused on the implications for design of the devices. The complexity of designing for ubiquitous computing goes beyond merely removing wires to make artefacts more aesthetic and mobile. With Mixed-Media-Devices it is not always possible to predict potential end users or the actual use due to the invisible and widespread nature of wireless networks. On the other hand, as designers we need some kind of way to approach the design of Mixed-Media-Devices.

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In my dissertation, I use one of the prototypes from the Major Incident application area, as an exemplary case of the design and research work I have participated in. I use it to extract and exemplify some of the answers to my basic research questions: How do we design for ubiquitous computing?

What can we learn as designers from the field of computer science in order to better understand the design challenges of the next generation of products embedded with information and communication technology, and can we frame the complexity of Mixed-Media-Devices in a way so we can engage with them in a design process.

The dissertation contributes with an insight in methods and processes used by computer scientist to approach the objective of making a new software architecture, essential for the next generation of products embedded with information and communication technology. It touches down upon implications for interaction and the physical design of Mixed-Media-Devices and concludes with a proposed model for designing for ubiquitous computing. The model is based upon the notion of habitats paired with the design process of the palcom project and encompasses the primary challenges to engage with when designing for ubiquitous computing.