PHD ABSTRACT

Title: Science Fiction Prototypes as Design Outcome of Research
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"*We were making the future", he said, "and hardly any of us troubled to think what future we were making. And here it is!*". Citation from H.G. Wells; *When The Sleeper Wakes* (1899).

The dissertation introduces science fiction prototyping as an engaging means of illustrating emerging technology research results. It explicitly demonstrates research that has been carried out for studying user experience in emerging contexts that can be found moving from ubiquitous computing to intelligent environments and, most recently, towards the Internet-of-Things. The emergent vision of the Internet-of-Things has been built upon technologies that augment our environments with unobtrusive, cheap and efficient electronic components: sensors, identification tags, extensive communication technologies, and smart, low-cost devices. These devices are able to communicate via IP networks, either on their own or via intermediate devices; the concept may thus be understood as a network of physical objects accessed through the Internet. The vision is highly technology-driven; however, the empirical research focus for the dissertation has been on placing people in the centre of design. Accordingly, the emergent technologies have been utilised for solving public sector societal challenges: finding means of reacting to the demographic challenges, discovering meaningful activities for the well-being of the aged and people with severe paralysis, and encouraging the social innovation of enthusiastic amateur designers.

The article-based dissertation contains two parts, comprising published articles. The first part introduces four case studies that have aimed at constructing user-driven, do-it-yourself experiences for the Internet-of-Things. The motivation for the human-computer interaction research lies in the consideration that intelligent ecologies will not emerge in one step, but evolve through the design of the functional, physical environment, an idea introduced by the Ecological Approach to Smart Environments (EASE). The approach has provided the theoretical background for dissertation research by postulating that the users of emerging technologies are expected to be active, to show initiative, and to share, in a do-it-yourself manner, the responsibility for developing their personal technical ecologies. The case studies have been carried out by multidisciplinary research teams, with the objective of building proof-of-concept prototypes. The main contribution of the dissertation lies in demonstrating the design conventions for studying the do-it-yourself experiences: definition of the user ecologies that form around the technologies, the design strategy for carrying out the empirical research, and the critical DIY experiences that form around the technologies. The most significant contribution for the EASE approach is in demonstrating the linking of technology development with social practices through design. The second part of the dissertation introduces three science fiction prototypes – short stories grounded on extensive user research of the first part – as the design outcome of research. The motivation relates to the acknowledged problem of "high fidelity" prototypes in the emerging technology research context – including the prototypes of the abovementioned research – the assertion being that while focusing on manifesting emerging technologies these are usually "ending up presenting merely incoherent scatter of incompatible technologies that expose only fragments of the field"*. The objectives for the low-fidelity science fiction prototypes of the dissertation were to demonstrate how to employ the grounding research, and how to deliver science fiction prototypes that place the experience design findings meaningfully in the centre of design. The main contribution of the dissertation is in introducing science fiction prototypes as radical, reflecting design outcomes of research – as design artefacts – and the accomplishing of a framework for designing science fiction prototypes that promote the findings of the experience design research in an inciting and thought-provoking manner.

The first set of articles includes internationally peer-reviewed academic publications: four case studies that have been executed in large, nationally and EU-funded research projects, in which the author's contribution has been to organise and carry out the design-oriented research. The second set of articles introduces three science fiction publications, written by the author, that have been equally peer-reviewed by international experts to assess their quality. The dissertation has deliberately pursued the division of these two parts in order to give them a conversational, vis-à-vis, relationship with one another. The focus of research has been on the connecting theme – the experience design – to which both parts have contributed. By way of conclusion, the versatile material presented in the dissertation implies that there is more than one way – even

within a single research set up – to design the future for emerging technologies such as the Internet of Things. As far as the material is concerned, it implies the effort of taking into deliberation H.G. Well 's notion of paying more attention to the kind of future we are currently making, especially for the people who will eventually be operating, interacting and living in the designed technology-augmented environments

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