AmI-Blocks'08: 2nd European Workshop on Smart Products: Building Blocks of Ambient Intelligence

Introduction and Summary of Contents

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1 Introduction

The AmI-Blocks'08 workshop took place at the Fraunhofer IIS premises in Erlangen. The papers presented in this proceedings have been selected in a peer-review process, where each of the papers was reviewed by two members of the program committee. Thematically, the workshop has been organized into four sessions: User Interface, Interaction, Embedding Technology & Trust, and Challenges.

The initial session begun with a brief introduction summarizing the current understanding of what features define a products as *smart*. First, a smart product "knows" something about itself, e.g., where and how it was made, what it is for, what it's functions are, where it should be, and who owns it. Second, it knows something about its environment, e.g., environmental sensor data, what other products and services are available, to which ones it can communicate to, or benefit from. A third property is self-sustainability, that is, the ability to fulfill the product's function without infrastructure support. The fourth feature is extensibility: since smartness is a concept that evolves over time, it is important that products can be extended to accommodate new and changing requirements.

2 Visions and Scenarios of Smart Products

The variety of the scenarios presented during this workshop shows how big the chances for innovation are: shop floor assistance, communicating artifacts for highly embedded scenarios such as automotive and household, ambient displays, manufacturing and logistics applications.

Such different scenarios imply different costs and technology constraints, and that calls for a more flexible combination of what features are needed in the smart products themselves, and what can be complementary deployed in the infrastructure.

In this workshop, the smart products presented and their proposed configurations have been equally varied as well: from *"high embeddedness"*-artifacts with a high level of augmentation, able to communicate and capable of general-purpose processing, to *"low embeddedness"*-mass-produced products with embedded RFID tags and their "smartness" deployed in the infrastructure.

Following the discussions, we have assembled in Figure 1 a conceptual model with scenarios integrating smart products with different combinations of what functionality is embedded in the product itself or deployed in the infrastructure. In the model we present different high level functionality modules called *Embedding*, *Controller*, *Embodiment*, and *User Model*.

3 Papers and Discussions

The first session discussed the topic of two characteristics of smart products: awareness of their surroundings and other products, and the possible uses of products as ambient displays, for instance to raise awareness of household energy consumption. The paper *"Pervasive Approaches to Awareness of Energy Consumption"* presents different approaches to building smart objects that do exactly that, but in new, innovative ways. For example, instead of using gauges and numbers, they resort to a small water cascade as a metaphor for displaying energy consumption as water flow level, or kitchen glass-doors with different colors.

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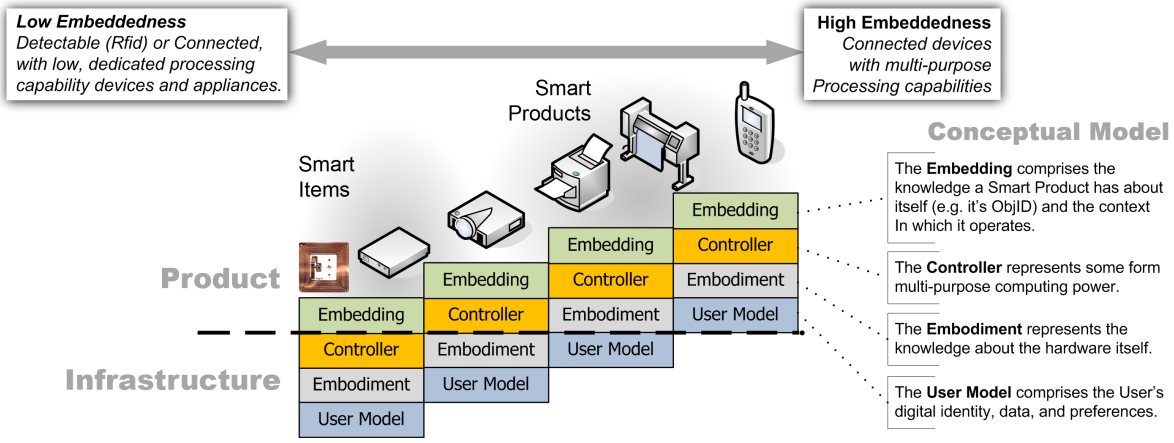

Fig. 1 Conceptual model of Smart Products and their configurations across different scenarios

In the following session *"Interacting with Smart Products"*, the paper *"CoRA - Interactive Communication with Smart Products"* showed a mass-product retail scenario, where users could retrieve extended information about the available goods (clothing in the example) to select those more appropriate. This paper also introduced two interesting aspects, the first one is the organization of the ontological knowledge in a modularized fashion, and the use of natural language processing (NLP) techniques to render better responses to the user. The second paper presented in this workshop *"Empowering Users to Shape the Internet of Things"* the author proposes a shift of control to the end users, as a key components to turn the idea of the Internet of Things into reality.

During the discussions that followed, broader questions regarding how we can interact with such smart products appeared, and to what extent interaction support should be embedded in the artifact itself, or whether it could be rather mediated by a trusted personal device such as mobile phone as the *"ME"* [1] trusted entity. At the heart of the discussion was also whether a more Mark Weiser-oriented view on smart products should be taken or not. While the first calls for a higher degree of embeddedness and autonomy, the second focuses on new architectures decoupling concerns in new innovative ways, e.g., reflecting the fact that objects may have different levels of augmentation, and therefore containing information about themselves but no computing power [2]. Another issue discussed was about the modality in which the interaction should happen. Again, the particular scenarios in which the interaction takes place defines the more appropriate channel: while users of a smart coffee machine [3] would quickly adopt and get used to a voice interface, in other scenarios as the one proposed by CoRA (shopping women underwear) discretion was of outmost importance and therefore visual interaction through a personal, trusted device was preferred.

The third session called "Building Smart Products" was devoted to two projects facing two different aspects of development: a software and hardware platform, and addressing trust and security issues. The paper *"AmbiComp: A Platform for Distributed Execution..."* proposes an innovative hardware and software platform suitable for highly embedded and dependable scenarios such as those that occur in the automotive industry. The interaction between smart products is often presented as a pure networking mechanism, but what happens when we need to address security and trust issues? The paper *"Association: Unobtrusively Creating Digital Contracts with Smart Products"* proposes a very interesting and novel approach called "Digital Contracts" to address the problem.

The final session presented some challenges for building smart products in general, and for raising ambience intelligence through the composition of smart products. The final discussion also underscored that – although standardization is important – we must fuel innovative scenarios and applications to further understand the nature of smart products.

References

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