A CUSTOMIZED SMART CONTROL OF THE UBIQUITOUS HOUSE

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1. Introduction

A smart home can be divided into two different concepts by strict definition. One is a widely received concept of a real house provided with Internet facilities. In such a smart home, communication among residents is possible, which enables remote control of the home appliances inside through the Internet network. The other concept is about a virtual home that exists in cyber space built on bits. This is an immaterial house, which appears in various forms such as 3D digital model and virtual reality model. The smart home that this paper is going to treat is a broad concept that integrates these two and comprises real smart homes and virtual reality smart homes built in cyber space. From here, the paper will go further to deal with the relationships between housing and humans. In the 21st century known as the age of sense, humankind stands at the center of everything. In order for home environment to provide greater convenience and comfort, we should a more appropriate definition of the housing-human relationship.

Pointing out that a lot of homes haven’t achieved comfortable residential environment, Intelle brings up as a reason the failure to allow active participation of residents in the design process. To increase the flexibility of a home, various interactions of residents with it must be allowed. Accordingly, the paper is going to explore the adoption of a smart home based on the ubiquitous computing technology for an active interaction between residents and a home. Realizing a home that can flexibly respond to the psychology and behaviors of people who live in it should constitute our goal in pushing for the future housing we have in sight.

To effectively accommodate the function of housing (smart home) in the digital age characterized by informatization and nomadism, user interface for
housing must change. In this light, this paper is going to present and discuss appropriate design directions for the user interface in a smart home with a view to vitalizing smart home.

2. User Interface for Smart Interactive Controls

Functions needed in a user interface for the Ubiquitous Home should involve providing house-related information and controlling a house. An advisable plan would have to include both the user interface that provides the type and location of devices in a house as well as information, and the user interface that controls the house. In order to effectively control the Ubiquitous Home, one must have accurate information on a house more than anything else. What a resident basically requires are the information on the spatial composition for a house and the information on the parts and sensors inside a house. To increase a resident’s interaction with the house, a user interface must be able to display information on the spatial composition of a house.

A user interface that controls in-house devices should allow interaction involving users. A user interface must be able to provide control as well as various images inside a house. With regard to showing images inside a house, it is very important in terms of user interface design to determine what technologies to apply (still image, animation, virtual reality etc.).

In addition to the house-related information displaying function, the user interface needs the function of letting a user control the house. One important consideration in the interface for controlling the parts of a house is that it should provide the function of performing quickly and easy control and that a resident should be able to figure out promptly the operation of a house following control. The principles for designing a user interface of the Ubiquitous Home should be summarized as learnability, flexibility, and stability. First, a user interface needs to provide a resident’s learning environment by supplying various information to the resident. A user interface must be familiar, comfortable, and its design should have consistency. Second, to ensure flexibility, a user interface should be allowed to be modified according to a user’s needs. Lastly, a user interface should be able to respond quickly to operational errors, provide accurate information on residents, and allow various user interaction.

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