

# Chapter 16

## Designing Ubiquitous Content for Daily Lifestyle

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### ABSTRACT

*This article presents a design theory for an emerging genre in digital content called Ubiquitous Contents. To design entertaining experience, the article introduces the design concept of the Experience Chain. Examples are shown to illustrate how people, artifacts, and environment can be seamlessly connected to design emotional and entertaining experiences through the interaction.*

### INTRODUCTION

“Content” is often viewed as an artistic expression delivered to the audience on mass media. Typical genres of existing contents include movies, animation, comics, games and music. However, contents cover a much wider area, including those that rely on personal media instead of mass media. In this 21st century world where information technologies like Internet and Ambient Intelligence develop

as infrastructures of society, contents that utilize such technologies are sought after.

Ubiquitous contents are contents for living people, those which bond closely with daily life. They are contents experienced through interaction between people, artifacts and the environment, all existing in the real world connected by networks. Ubiquitous contents are emerging genre of contents, which become realized through the embedding of Ambient Intelligence, in particular ubiquitous technology with sensors and actuators.

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This article presents the design theory for Ubiquitous Contents with emotional and entertaining experiences.

## **RELATED WORKS**

Weiser opened the door of the research activities to make computers invisible and embed them into everyday life (Weiser, 1991). Vasilakos and Pedrycz (2006) describe that people will be surrounded by networks of embedded smart artifacts in the ambient intelligence environment. In order to create this ambient intelligent environment, it is important to give equal importance on product design and interaction design in addition to the ubiquitous technology research because end users see value in the “looks and feel” of the artifacts. At MIT Media Lab, researches on tangible interfaces and ambient displays stimulated the community to integrate computing technology with the aesthetic aspect of design (Ishii, Mazalek, & Lee, 1997).

“Music Bottle” proposed an interesting mixture of product design, tangible interaction design, and pervasive computing that completely hid the technology (Ishii, Mazalek, & Lee, Gottles as a Minimal Interface to Access Digital Information, 2001). Each musical instrument is controlled by the bottle. When the bottle is placed on the table and the bottle cap is removed, this interaction triggers the instrument to start playing. By placing multiple bottles, the ensemble can be performed. The tangible interaction is a natural interface between people and the computing system that allows smart artifacts to be used in the everyday environment.

Numerous research projects from the international community were published on the topic of smart artifacts and environment (Aarts, 2003; Streit, Rocker, Trante, van Alphen, Stenzel, & Magerkurth, 2005). “Mediacups” is a coffee cup that knows if the cup is filled or empty (Beigl, Gellersen, & Schmidt, 2001). This type of artifacts is called smart artifacts. In “Hello.Wall”,

the wall acts as an ambient display, but it is smart to understand if a particular person is within the range to provide personal information (Prante, et al., 2003). “ComWalls” are a set of illuminating wall devices that are connected by the network (Tokuhisa & Inakage, 2006). They act as ambient displays that allow tangible interactions with the users.

It is important to theorize smart artifacts and environments in the context of experience design and interaction design. Dourish (2001) emphasizes the importance of physical action and interaction, McCullough (2004) extended the theory to the relationship of people, place and pervasive computing. Shredroff (2001) claims the importance of experience and discusses the elements to create a memorable experience.

## **DESIGN THEORY FOR UBIQUITOUS CONTENTS**

### **The Experience Chain**

In our daily life, we accumulate experiences through interaction with artifacts surrounding us, environment that we immerse in, and communication with people and living bodies such as pets and plants. All of the activities contribute to building one’s experience. As the result, we actuate the experience as some kind of expression through embodiment. This actuation acts as an input component for other person’s experience.

The complex chain reaction is called the experience chain (Figure 1). Blocks are aligned as a time sequence from left to right. Each block in this figure is an artifact, the environment surrounding the user, or contents such as movies and games. Arrows, connecting the blocks, show how the blocks mutually influence to create this chain of experience. It can be viewed as input stimulation for sensors and output stimulation for actuators.

This model implies that people may be considered as a design component with inputs and

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