Tangible Media Communication Design in Future Home Environments -@home project-

Hideaki Ogawa, Atsuro Ueki, Mizuya Sato, Yuichiro Haraguchi, Masa Inakage

Keio University IMGL Future Expanded Entertainment Laboratory (FEEL)

feel@keio.to

Abstract

This paper presents the key concepts and products of the @home Project[1] (FEEL group, Keio University Inakage Lab), a research group on communication media design in future home environments. This project looks at the design of "human-information", and "human-human" communication media within the home environment. Through the study of design approaches for supportive tools, we produced nine prototype models using tangible media (managing digital information through graspable physical objects) and demonstrated them in a public exhibition.

1.Introduction

1.1 Background

Today, we are about to realize a ubiquitous[2] environment where digital information can be accessed from virtually "anywhere, anytime" through the Internet. With it will come a change in the way we design information media.

In the home, networked information appliances are coming into practical use through the efforts of major manufacturers. Information devices derived from the market mechanism appear before us in the form of products, used by people who do not contemplate its potentials or problems. In the field of research, the future of "human-computer" interaction is discussed, in such groups as in ACM SIGCHI. As exemplified by Tangible Bits[3], we are beginning to see the materialization of, not only graphical user interfaces, but real world oriented contents utilizing the principals of human behavior and physical characteristics. However, these concepts are limited to proposing designs for user interfaces and often do not consider communication design in actual environment settings.

1.2   home project's themes and concepts

The @home Project, based on the concept: "there is a need to design media in accordance with the place and setting for which people live", proposes communication media design specified for the home environment. We analyze the conducts and contexts in the home, apply the concept of Tangible Media as interfaces between man and computer, and propose a model that seamlessly integrates into our living environment. The emphasis is put on the design of communication, not the interface.

Ultimately, we create a setting for where we can discuss the proposed models with the public; and send a message out to society about the key concept of our study, or the relationship between "human-information and human-computer."

2. Proposed model on communication media in future home environments

The @home Project developed a total of nine prototype models. Each prototype was designed based on conducts and contexts within the home. The common concept behind each design was "to handle digital information as one would handle physical objects" and used "tools and furniture found in any household" as interfaces for obtaining information. Each prototype is also a networked device that assumes a broadband Internet environment.

2.1 Tangible interface as a straightforward method for communication of information

Here, we provide information present within the home and information desired in the home in a manner that is easy to understand.

This tool shows the day's weather through the turning of a faucet. It lets users access information, not by keyboard and mouse, but through an everyday routine activity.

Figure 1: Mirror

Tells the water temperature by using our natural sense of color; warm colors, if the water is hot, and cool colors if the water is cold. It helps create both a comfortable and informative living space.

Figure 2: Aqua Palette

2.2 Tangible interfaces for communication with distant people

We created models for communicating with distant people from the home through natural conducts and contexts. The @home Project places an emphasis on the possibilities of private communication using "networked objects and furniture." Next, we introduce four communication media:

Figure 3: Twin Lamp

Using light, an ancient form of communication; the intuitive action of lighting a lamp conveys a sign of human presence through a network.

Figure 4: ShareWall

A tool that lets users share a wall with a distant partner by "knocking". Using the physical and psychological characteristics of the "wall" metaphor, creates a space that feels as though there is a friend in the next room.

Figure 5: Canvasation

A canvas hung on a wall, shared through a network, lets parents of commuter marriages communicate with their children back home. It is method for families to sustain constant communication.

Figure 6: Cobox

Lets users share a small space inside a box with a partner. Using the affordances of the "box", creates a small environment for which users can enjoy private communication.

3. Environment analysis and scenario-based communication design

The proposed models in section 2 were created based on design approaches derived from research done in the @home Project. This design approach was devised by application of design research in Philips Design's "Vision of the Future"[4] and IDEO's environment analysis design[5]. The following is an overview of our design method.

3.1 Setting the environment

We focused on the "home", our most familiar environment, as the stage for our study. We first created a virtual model family, and decided the family make-up, along with the personalities of each of the family members. We assumed a home with a broadband, always-on Internet connection as the model environment.

3.2 Extraction of keywords

From our research, we selected "everyday" "common sense" "simple" as keywords for the @home Project. We built the following hypothesis: "In the home, the most practical and effective method of acquiring information is through everyday activities or objects."

3.3 Analysis of conducts and contexts in each room

We analyzed and extracted common activities in each of the following rooms: "living room", "entrance", "bathroom", "lavatory", "kitchen", "personal room", and "bedroom".

3.4 Decision of contents, and scenario design

We decided which activity to support in each room using our data on conducts and contexts. Then we created a story on how our supportive tool would be used. We use the story to modify the tool, and to make further applications.

4. @home Exhibition

In order to present the results of our study, we held the @home Exhibition. The purpose of this exhibition was to share opinions about the applied model with exhibition visitors. We had many visitors from various backgrounds, and many discussions on the future of "human-computer", "human-information", and "human-human" communication were heard. At the exhibition, the scenarios used in our design process were placed along with each of our works so that the activities and relationships that the tools support would be better understood. We produced a virtual home environment at the exhibition site to show how the tools would weave itself into our living environment.

Figure 7: @home Exhibition

5. Conclusions and future applications

We believe that, not only shape and color, but the design of "human-information" and "human-human" communication in a human-centered environment will become important aspects of future design. They require unified aspects with interdisciplinary approaches, and an open-minded attitude toward new technologies. Today, the members of the @home project continue to develop new models in the home, along with expanding research areas on the relationship of human and information to public spaces (Infoscape in the city) such as "train stations" and "cities", and commercial spaces such as "cafes." A demonstration of the former model, the future of "human and city information", will be exhibited on October of 2002 where a information center will be designed at the subway station square in Kannai station, Yokohama-City. We plan on developing this model into a future inner-city media.

References

[1] @home project http://www.imgl.sfc.keio.ac.jp/feel/

[2] Weiser, M. The Computer for the 21st Century, in Scientific American, 265(3), 1991, pp.94-104.

[3] Ishii, H., and Ullmer, B. Tangible Bits:Towards Seamless Interdaces between People, Bits and Atoms, *in Proceedings of CHI'97*, pp.234-241.

[4] Philips Design, vision of the future, 1996

[5] IDEO, WITHOUT THOGHT, DMN&IDEO JAPAN,1999