

# Ubiquitous Community Support System for UbiComp2005

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## Abstract

One target of a ubiquitous computing environment is to create and activate communities in which people interact in a lively manner based on their interests and situations. To achieve that goal, we have been developing a “ubiquitous community support system (UbiCoSup)” for event spaces since 2002 because event spaces have rich contents and interactions among certain interest groups and myriad sub-communities. We have been developing the UbiCoSup by elaborately fusing **web support** systems based on cyber world interaction and **onsite support** systems based on real-world interaction. In 2005, we were kindly granted the opportunity to demonstrate the newest UbiCoSup for all attendees of UbiComp2005. This paper briefly describes the system architecture and the characteristics of each system.

## Keywords

Ubiquitous, Casual support, Casual user interface, Community support, Event space, Real world interface, Social network, Wearable computing, Web intelligence

## 1. Introduction

Increasingly, people will enjoy information services while moving in the real world. Among aspects of “pervasive”, “ubiquitous” [1] and “context-aware” [2] computing, the most important is realization of a context-aware information service system that supplies proper information “here, now, for me.”[3] Figure 1 shows the way in which this study specifically addresses the use of location as a salient clue to the context; it develops a

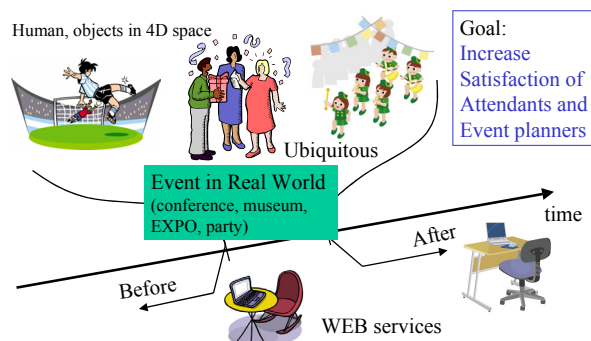


Figure 1 Ubiquitous Community Support for Events

system for event space. The event space includes conferences, museums, expositions, concerts, parties, and so on with rich on-site contents that can benefit from investments of installing a ubiquitous environment. It is noteworthy that contents in event spaces include not only exhibits and demonstrations, but also the attendees themselves.

We are particularly examining those technologies that create and foster communities of attendees and event operators. Because we believe the attendees can enjoy and use the real-world event through connection with proper contents and people. The system delivers rich contents before the event period; attendees’ communities can grow using web services such as a human relationship browser and scheduling system. In that process, the system

automatically helps the attendees to communicate with other attendees using AI technologies. Such preparation will activate the event and continue to enhance and expand communities after the event.

Interactions on the web support systems are enhanced by onsite support systems. Each attendee can use a simple device to log in to the web services and onsite services such as **ActionLog** or **Tabletop Community** using the information kiosks with sensor/display network. The web support system obtains interaction information between an attendee and the onsite system, and vice versa.

In this paper, we mention the newest UbiCoSup for UbiComp2005, which is a revision of the system demonstrated on the Japanese Society of Artificial Intelligence (JSAI2003, JSAI2004, and JSAI2005).

The next section explains outline of UbiCoSup for UbiComp2005. Some systems are explained briefly in Section 3. Section 4 concludes this paper.

## 2. UbiCoSup for UbiComp2005

An attendee can use onsite support systems during the conference period and web support services from late August until late October. The employed sub-systems for UbiCoSup are the following:

- Casual support

People, using an IC card, can easily use onsite systems such as **Tabletop Community**, which realizes artistic expression of people's interaction among the community capturing both scenes and sound. A user can easily link the card to a personal login ID of the web support system and the onsite system can support the user merging the information from both the on-site and the web system.

- High-end terminal support

**Information Clip** and **UbiBoard** use a cellular phone to enable users to achieve seamless information support with a web support system. Both systems use paper, whiteboards, and an online character reader. Thereby, they firmly connect the real world and the cyber world.

- Communication/Contents support

**POLYPHONET** obtains attendees' relationships from web sites and scheduling systems. This system is the integration basis for other systems. **ActionLog** activates communications by enabling real-time comments based on automatically created attendees' action logs. Furthermore, interesting systems exist, such as avatar communication-based systems; **TelMeA**, an annotation based system;

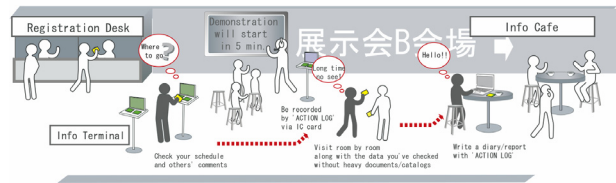


Figure 2 Onsite usage scenarios

**Ironomy**, and presentation categorization method; **NishihaLink**.

Figure 2 shows onsite usage scenarios. Attendees can obtain IC cards and use the **Tabletop Community** on the information kiosk directly. They can also access the web support system by linking the card to the web login ID in a simple way. An attendee can also use cellular phone to view an interesting presentation on the program or on-site posters and demonstrations by capturing the barcode. Those onsite support systems are connected with web support services by **ActionLog**.

## 3. Sub-systems of UbiCoSup

### 3.1 Casual Support

Takuichi Nishimura, Yoshiyuki Nakamura, Yutaka Matsuo, Masahiro Hamasaki, Keisuke Ishida, Tom Hope, ITRI, AIST

We define a casual interface as an intuitive, low-cost, privacy-free interface. We can dispose of it or change it very easily according to the community. Consequently, the danger of privacy infringement decreases because it is difficult to track users without a common device. Therefore, future users of such systems will continue to use not only high-end devices such as cellular phones, but also casual devices. Examples of casual devices are RF-ID tags, ID cards, and remote controllers.

Based on the discussion above, we have developed the CoBIT[4][5] – a compact, battery-less information terminal – which can provide situated information based on a user's position and orientation. The CoBIT is a small, inexpensive communication terminal that functions using only energy from the information carrier and the user. We realized a CoBIT exemplary system that downloads sound information and uploads the user's position and orientation, and potentially, signs from the user.

Such casual devices are important for various kinds of people to access rich digital information services easily and casually. Nevertheless, our target is to realize seamless information support from casual support to personalized support. Users can casually and safely choose to get personalized information support by gradually inputting personal information. Casual support for UbiComp2005 enables the user to link at any time and cut the link with a web support system.

We employed CoBITs for JSAI2003 and JSAI2004 to achieve sound information support in a quiet environment, but we use IC cards for JASI2005 and UbiComp2005 because we are displaying a support system that does not use private sound feedback.

### 3.2 ActionLog

Hideaki Takeda, National Institute of Informatics

Kosuke Numa, The Graduate University for Advanced Studies

ActionLog is a Weblog authoring support system that automatically generates entries with users' context. Context is triggered by users' actions such as watching posters and using demonstration systems. The published entries are aggregated according to their context and are presented.

### 3.3 Information Clip

Hiroshi Nagata, Eiji Shinbori, Media Technology Research Center, Dai Nippon Printing Co., Ltd.

Many presentations or demonstrations exist at the conference, but attendees might have difficulty recalling details and on-site impressions. We intend to provide an environment for information clipping by applying cellular telephones. Scanning a clip signal like a QR code on the paper program or RFID tags on a poster, an application user can record an interesting demonstration and can save pictures or comments as their impression. In addition, they can communicate with a presenter via sharing their pictures and comments.

### 3.4 UbiBoard

Osamu Nakagawa, Eiji Shinbori, Media Technology Research Center, Dai Nippon Printing Co., Ltd.

The UbiBoard is the bulletin board system that makes use of a digital pen. The same information as a handwritten message in the real world is published to the bulletin board on the net. A user can see your own message and its associated reaction from the PC or the portable terminal anywhere at any time.

### 3.5 Tabletop Community

Noriyuki Fujimura, Takuichi Nishimura, Yoshiyuki Nakamura, ITRI, AIST

Satoshi Fujiyoshi, Kazuya Sakamoto, ALPHA SYSTEMS INC.

Tabletop Community presents interactive artwork that depicts and defines interactions within a community. The artwork consists of (either single or multiple) table-like information kiosks and software systems. Every time that users (Active audience) of the artwork access the kiosk using an RFID card, an omni-directional camera takes an image of all people around the kiosk. The system visualizes these photographs of the people from the past to the present

as a hypothetical representation of the community around the table.

The system was designed from an inspiration from commercial arcade photograph taking-printing machine, "Puri-Kura (Print Club)", which was popular among younger generations in Japan to take photographs of friends. However, a distinction of this artwork is that it represents the form of connection among photographic images. Thereby, the system/artwork might assist formation of a community over the time as well as creating congregational art from the community interaction.

### 3.6 POLYPHONET

Yutaka Matsuo, Masahiro Hamasaki, Keisuke Ishida, ITRI, AIST

Recently, a vast amount of information related to research activities is available on the Web. We developed a social network extraction algorithms based on Web mining technology. It is very important to find appropriate researchers to collaborate in an interdisciplinary research field. In addition, cooperation with local communities and industrial communities is important for researchers. Our goal is to support and promote efficient collaboration so that research activities can have a greater impact on our society.

The POLYPHONET makes it possible to display a researcher network and to seek individual researchers through a collection of research works and publication data posted on the entire world-wide web. The system extracts various aspects of researchers' relationships in connection to research activities. Moreover, it is possible to seek a researcher's name based on the interrelationship between researchers. Through these capabilities, it becomes possible to search for researchers in different disciplinary areas using available data.

The POLYPHONET is partly integrated with a scheduling system which supports for users to make a personalized schedule at a conference. It also provides functions to register acquaintances, which increases the reliability of a human network. The POLYPHONET plays an important part by uniting the entire system with an elaborate user interface design.

### 3.7 TelMeA Theatre

Toru Takahashi, ATR Media Information Science Laboratories

TelMeA is an asynchronous on-line community system employing animated avatars. Using the TelMeA Theatre, participants can communicate using rich emotional messages expressed by their avatars. TelMeA Theatre also provides a method to refer shared context in the form of

images and web pages. Messages are created easily using its GUI editor. Then they are posted to the community server to be referred by other participants.

#### 4. Conclusion

We indicated the importance of addressing an event space as a first step in realizing ubiquitous community support (UbiCoSup). We explained the UbiCoSup for UbiComp2005. Future efforts will combine mobile robots and develop other event spaces that have different community characteristics that are expandable to daily life.

#### 5. Acknowledgements

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