

# **SOCIAL EVENTS AWARENESS SYSTEM IN DESIGN ENVIRONMENT: An Interactive Public Information Services Provider**

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**Abstract.** This paper is an application of its main project, “Interactive Public Information Services Provider in Design Environment”. The project is based on the ID sensing technology and network services to support the social events, formal/informal communication, data communication, etc. In the paper we emphasize how we can support social events in pervasive computing method. An architect indicates that informal communication is the key to creative ideas in design environment (Henn, 2002). Here we describe how the concept of the main project can support the awareness of social events in design environment. We introduce the awareness system in three parts: (i) Scenarios (ii) Parts in the framework (iii) The design issues in the system.

## **1. Introduction**

### **1.1. SOCIAL EVENTS HELP DESIGN WORK**

Lots of formal and informal meetings and chatting are held everywhere in the design environment. Most informal meetings or chatting take in place a social place such as the lobby, coffee corner, hallway, etc, and those present willingly accept others' joining in even when there is a feeling of intrusion from other members. In modern work office environments, designers usually grasp the information they want through the internet at their work seat, and they also accept any other information as peripheral awareness from neighbourhood colleagues, but this kind of awareness is very local and far removed from some social places. In a way, members at their own seats might not be aware of the social events in social places. For example, a designer is busy in his digital art. His group colleagues who have an idea chat at the magazine zone without informing or inviting him and exchange interesting ideas of group work. The idea might have been inspiring to the designer, but he was not even aware that the chatting took place. If he had seen aware of the chatting, he could have chosen to join or ask colleagues to get the context of chatting, or those who are in the magazine zone could have been aware of the existence of the designer and invited him to join the

chatting. Due to the partitions of OA furniture and the plan arrangement of the office, members at their own seats are hardly aware of other social events and those who are in social places may not even be aware of who is at the seat. Thus one of them may lose a chance to coordinate and integrate the group work or get some good ideas. Studies of organizational and office work show that 90% of brief conversations are unplanned (Whittaker et al., 1994). A questionnaire data shows that informal communication takes up 25% to 70% of the general working hours, (Kraut et al., 1993) and beyond time, informal communication is considered to compensate for the weaknesses of the formal flow of information. Schütze (2000) and Henn (2002) indicate that 80% of innovative ideas created in offices are a result of informal personal communication. Therefore, we may say that informal communication may play a more important role than the formal one. However, the contents of these social events are hard to share with colleagues who didn't join the social activities. For this reason, a mechanism of social events awareness and back sharing channel are required. Beyond the synchronized situation, in some design studios, members would have a different habit of working time. In this situation, colleagues have few chances for informal or formal meetings. In order to promote the informal conversations, the mechanism mentioned above should also support asynchronous situations.

## 1.2. SCOPE AND OBJECTIVES

Even since Mark Weiser (1991) first talked about the new vision of the computer for the twenty-first century, the idea of pervasive computing has been discussed for over a decade. As an emerging computing paradigm, pervasive or ubiquitous computing has motivated both researches and industry on several IT infrastructures. Most pervasive computing ideas have been composed by computers, tangible devices and networks. In this paper we describe a social events awareness system framework as shown in Figure 1 which is based on located members' interactions and information flow.

We found that informal communication is as important as observation in design environment. However, members may not be aware of social events because of the bad plan relationships between personal seats and social places. We use two terms, "monitoring" and "displaying" (Schmidt, 2002) to form the concept of computer supported system for the social events awareness between personal seats and social places. Based on a scenario and steps in social awareness, the system is mounted on the three main functions: (i) Monitoring the existence state of the social place (ii) Displaying the light weight meanings of the group ID and activity both in personal seats and social places (iii) Broadcasting the information of public social events, given specific instant messages over network services. The main system framework includes two parts: (a) Public Information service provider (b) Ambient information

notification devices. Later, we'll use a scenario to describe how the framework functions.

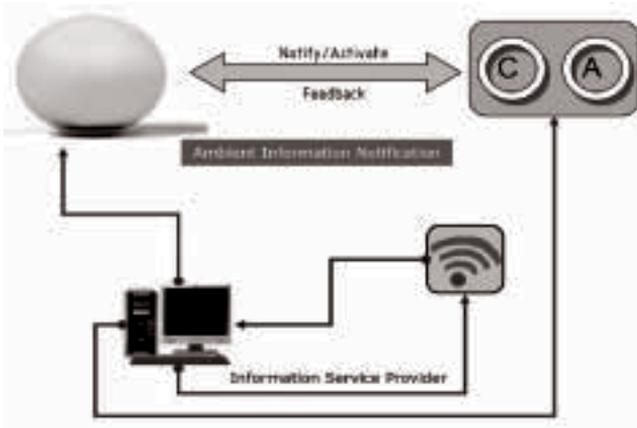


Figure 1. Basic Framework.

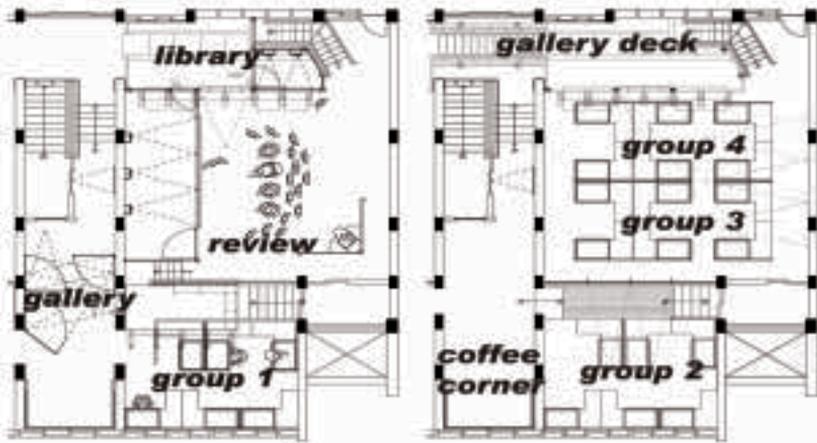


Figure 2. Design Studio 1F & 2F.

## 2. Scenarios

In Figure 2 we see a design studio (in NCTU) with four design groups and several social places such as review room, a small library, gallery and coffee corner.

### 2.1. AWARENESS OF SOCIAL EVENTS RUNNING AND JOIN IT

Mary is a member in Group 1 and has colleagues, Ted, Greg and Jean. One day, during reviewing, Mary went back to her seat after her turn finished. After review,

Ted, Greg and Jean went to the coffee corner at second floor and had an easy talk good coffee. While they were talking, the coffee corner had sensed their ID as colleagues of Group 1. At the same time, the ambient device showed a flickering blue light to draw the attention of the colleagues of Group 1. Greg was aware of the blue light flashing from two buttons near the coffee machine and pushed the “Colleague” one. After the button was pushed, an illuminated orb in front of Mary’s desk faded into blue colour, and the slow change drew Mary’s attention. Then Mary became aware of the social event happening in the coffee corner and she decided to join the conversation. She touched the orb, and the orb faded into yellow colour to show that she would like to join the conversation. On the other side, other colleagues also had noticed that the “Colleague” button had faded into yellow one. After a minute, Mary went to the coffee corner and joined them.

## 2.2. CREATING THE CHANCES OF INFORMAL COMMUNICATON

Following the scenario mentioned above, what if Mary didn’t touch the orb (she didn’t want to join the talk), she would still know that social event had happened. If she saw other colleagues in the area of Group 1, she could ask a colleague about the contents of the conversation. Otherwise, if Mary had not been at her seat at the moment while other colleagues’ were talking, the illuminated orb would still fade into blue colour. When Mary came back to her seat, she would learn about the previous social events. If she were interested, she could ask Ted, Greg or Jean for contents of the talk.

## 3. The Framework of the System

### 3.1. AMBIENT INFORMATION NOTIFICATION DEVICES

#### 3.1.1. Ambient Awareness Bottoms

In Figure 3 we see the concept of the Ambient Awareness Buttons set. The set include two bottoms embedded with LEDs. One is named as “Colleagues” and the other named as “All”. When the RFID reader sensed the ID of who are in the social place, after thirty seconds, the LEDs of the buttons will fade into a colour (depending on the social place). If the member is aware of the light, he can choose a button to push. The action of pushing a button is a trigger to tell all members in the studio or just group colleagues that the informal chatting is going to run. When someone notices this, the LEDs of the set will fade into yellow colour.

#### 3.1.2. Illuminated Orb

Figure 4 shows the concept of the orb (we use the Ambient Orb which is developed by company “Ambient Device” as the prototype). When someone pushes the Ambient

Awareness buttons in some social places, the orb will fade into a colour which represents where the social events happened (e.g. coffee corner: blue; gallery, green, etc), and the light flickers if the Ambient Awareness buttons are set in “Colleague” mode. When the orb owner touches the orb, the orb and the Ambient Awareness buttons will fade into yellow colour to show that the orb owner is willing to join the social events.



Figure 3. Ambient Awareness Buttons.



Figure 4. Illuminated Orb.

## 3.2. PUBLIC INFORMATION SERVICE PROVIDER

### 3.2.1. Embedded ID Sensing System

Most of students' ID cards are embedded with RFID chips, and we can sense who is in the room via a long-term range (about three metres) antenna hanging on the ceiling.

### 3.2.2. Control Server

The server is the central part to control the information flow. It contains the database of the students' ID and an agent to send instant messages of Ambient Awareness buttons.

## 4. Issues in the Framework

### 4.1. NOTIFICATION IN THE AMBIENT WAY

According to the idea of calm technology (Weiser and Brown, 1996) modern technology is trying to show its powerful functions via their exaggerated notifications. Weiser thought the information should be shown in a calm way. As the peripheral awareness, the term “notification” should perform in a calm way in personal seats. Beyond Weiser's opinion, we think that the information appearing in the right place and in right situation can also be called unobtrusive or appropriate obtrusive awareness. Those cases usually can be found in some social places in the work office. Therefore, notification device designing for social places should be more obvious than personal seats. The “Illuminated Orb” we consider the concept of Ambient Orb ([www.ambientdevices.com/cat/orb/orborder.html](http://www.ambientdevices.com/cat/orb/orborder.html)) as the decoration

on the desk. On the other hand, Ambient Awareness buttons can be placed in a more obvious location, such as the top of a coffee machine, book shelves or walls of the gallery.

#### 4.2. MONITORING PRIVACY IN AN IMPLICIT WAY

Monitoring is a general concept of awareness in CSCW. Here, the state of social places will be monitored by the system. The main purpose of the monitoring will not be direct for members at personal seats but for the social places as a trigger to provide the public services for those who chat in social places. The system acts in a polite manner, because we consider the privacy of who is in a social place, and those members may not be willing to broadcast where they are or what they are doing.

#### 4.3. “COLLEAGUES” OR “ALL”

The two social events broadcasting mode will lead to two supported situations: traceable and non-traceable. From the messages of the illuminated orb we can know where the social event happened but can't know exactly who is in the social events, especially in the mode “All”. If a member receives an instant message from the orb in “All” mode and ignores it, he can't find someone to trace the contents of the talk. In contrast, if the orb receives the instant message in “Colleague” mode, the orb owner has the chance to trace the contents of the talk by asking someone in the same group. The two preserved choices for who is in social places, have decided not only who will get the message but also the possibility of tracing conversation contents.

### 5. Future Study and Implementation

Here we roughly describe the entire framework of the social events awareness system. The system is under implementation and will be tested in the real design environment after its first presence of the prototype. In the future, we will consider more issues about CSCW and pervasive computing in design environments, and we believe that design environment has its own features to apply in CSCW and pervasive computing researches which are valuable for the future vision of design environment.

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