

Research on Development of Awareness System for Remote Home-living

Chien-Hsu Chen* I-Jui Lee** Fong-Gong Wu***

**Department of Industrial Design, National Cheng Kung University
Tainan, Taiwan, e-mail: chenhsu@mail.ncku.edu.tw*

*** Department of Industrial Design, National Cheng Kung University
Tainan, Taiwan, e-mail: iammimosa@gmail.com*

**** Department of Industrial Design, National Cheng Kung University
Tainan, Taiwan, e-mail: fonggong@mail.ncku.edu.tw*

Abstract: Emotional connection of Family environment should be given the basic conditions for family members. In view of the busy life, family members tend to own different living habits. Home has failed to provide sufficient link capacity of communicating; people have been led to alienate from each other. In this study, in order to develop the sharing platform, it explores the traditional ways of communication, which aims at building the “place to people” connection based on family emotion, and uses the simultaneously remote message to communicate with other family members. Moreover, constructing the "Remote Family Awareness System" in order to discuss the (Person to place) of non-real-time (Asynchronous) mode of transmission. Let family members be able to participate in each other's daily life while they are in different locations. Also, the visualized environment can be given to family members who look for emotional needs.

Key words: *Perceptual field, intelligent environment, family care, emotional perception, family communication, awareness system.*

1. Introduction

"Remote Family Awareness System" is a network platform that people can use the hand-written, video or text input to leave messages. By passing the content of “human characteristics,” people can show consideration for each other. In daily life, people will use several ways to organize and plan their life, and through this ways to maintain their relationship. [3] These methods often appeared at home and become a connecting network for family. The most common form is used in the calendar, bulletin board, or post-it as a tool of memorandum and making arrangements for activities (Figure 3). For example, post on the refrigerator door, next to the phone or the kitchen wall, these tools become the most primitive and highly representative of the contact mode. [6]

1.1 The context of the system

This context of the system gives the background of the small families and the single-out (Figure 2). In this research we divide our family scenario into Home Inhabitant Relation and Intimate Social. The main factor is for the sake of striding across the difference relationship between the distances in the social environment. Awareness System plays an essential role in the context of different communities. The system mainly promotes the interaction and reduces the distance between the family members.



Figure.1 The operating system in the family

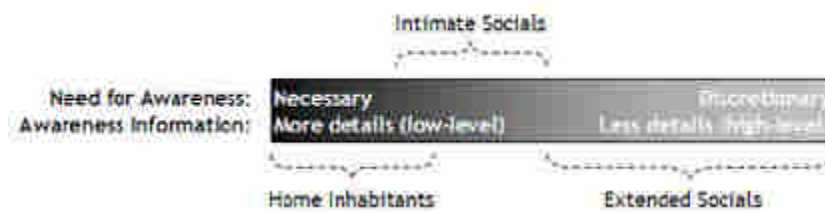


Figure.2 Correlation between people [6]

1.2 System tasks

Different stages of the family home affairs. System confronts the test which includes the fundamentals (Basic Needs), maintaining the daily needs (Maintain Needs), enhancing the emotional connection (Enhance Needs) and other tasks. By category contains 1) The basic needs: physical, housing, and economic, etc 2) The maintaining needs: coordination, management and domination. 3) Enhance the demand for psychological caring interactive communication.

2. Paper Prototype

2.1 The process of how users use stickers

The project explores how media space concepts could be incorporated into households and family life. In the design system, Memo-stick is the recoding and reminding tool which most people are familiar with. Its fast and convenient operational feature is well-known used for the general people. [1] [2] It makes message be attached on the carriers with the habitual tool rapidly. Such as a combination of pencil and paper which can retain the message intuitively.



Figure.3 Cases of different contact information (a) Close family members leave sweet text (b) Hand-written of psychological feelings (c) In different locations, people will want to contact each other (d) Common calendar. [2]

2.2 Human System Interaction

When users operate the system, the process of interchanging information between the human and environment will be carried out. [2] [5] [6] In the interaction of the systems and human, the context of user's feeling is virtually captured and also be shared with other family members who are in the system. Also, in the operating process, the messages which possess emotion have been transferred to the other and produced a feeling of emotional connection. (Figure 4)

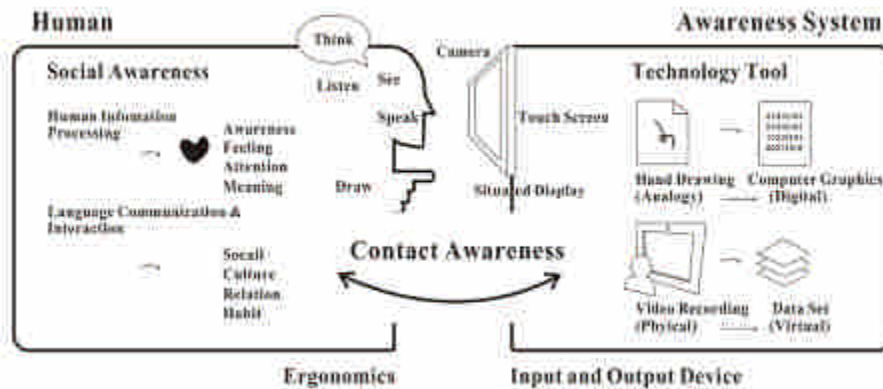


Figure.4 Human system interaction

3. System Design

System is built in the center of the home (Figure 5 gray blocks), it plays the role of messages center and forms Home Area. By using Situated Display [4] [7], family members who are in the same living circle can transmit messages to each other through the displaying interface, which makes family members share their life experiences with each others. Through the Internet Technology, the system links the relatives from remote locations and outward expands to link external environment, and also disperses to distinct spaces. The same network will be able to connect family members from different locations, which makes they can be perceived of each others' situations and shorten the distance between each others, even to get closer to each other feelings.

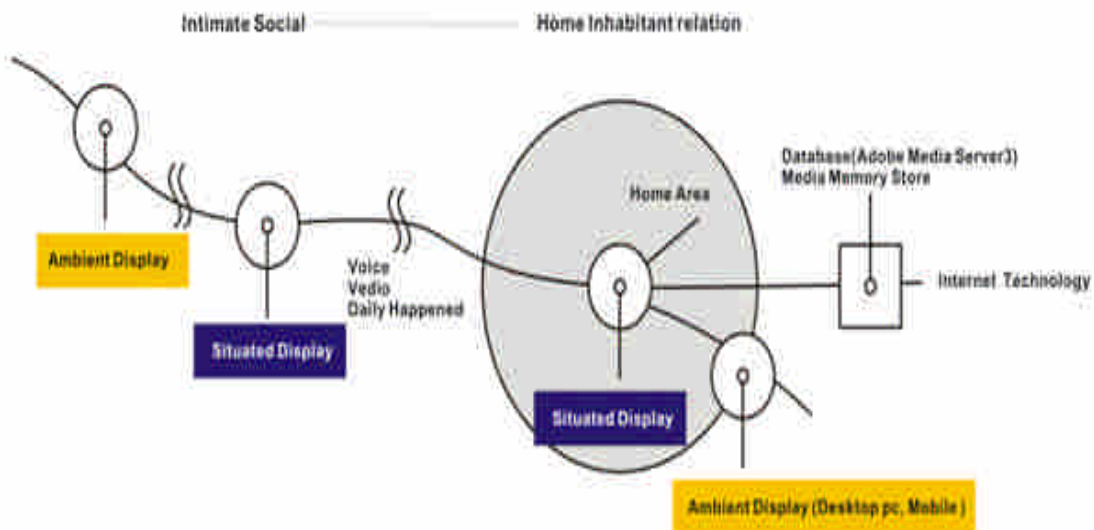


Figure.5 System framework

3.1 Hardware and Software

System interface makes use of Flash real-time synchronized technology (Adobe Flash 8.0) to modify controlling interface become more smooth and beautiful. Through the PHP back-end database (Using Apache + MySQL), which allows users' audio-visual data be stored in accordance with identities, time, and subjects. Also, to integrate the recording function of Adobe Media Server3.0, which makes audio and video will be stored on the system hard disk. Through the network and server being set up, the system mainframe can make videos be connected to different clients. The users can carry out video recording by hardware equipment at different locations in order to make the home environment and remote server come into being a network platform.

3.2 System operate processes

While family members enter the page of the operation, they may choose to write a new message or turn into the reading frame. When users start it, they can choose different types of message to give it a post. After leaving the messages, the users can directly drag the post-it adhering to the one they want to leave a message for, and then the procedures of leaving a message is completed (Figure 6).



Figure.6 Drag messages, adhering to the message object

Hand -painted message

User can use hand-painted to send the messages, and adjust the stroke size of colors and thickness, as the same way as using the crayon to make a draw. Using this way to leave a message can enrich the content of message, and also present personal style and emotional expression in the content of hand-painted messages (Figure 7). To retain the operational mode of cards or the traditional paper, it combines with the way of traditional hand-written graffiti which enhances the performance of emotional messages and also upgrade the delight of content.



Figure.7 Shows the hand drawing

Text Input Interface

System reserves keyboard input interface, and adds the touch keyboard. Thus, the users can rapidly leave the text message and publish messages to other family members.

Video Record Interface

The function of video recording is as the same way as using traditional recording equipment. The operating process is like using the general recording device.



Figure.8 Shows the message status

4. Applications

Short-term task operator

We use task analysis as the main experimental method for short-term task operators. The experimental method promotes users to carry out integrating living status of environment through continuous using experience. Through immediately responding and discussing with users, we can realize the transform of operational behavior and also the transition of the environment.

4.1 Task analysis

Task analysis mainly enables the subjects to be integrated into the needed context much faster. In the experimental process, we conducted the experiment allow users following steps to carry out operating the process of system and find the potential demands.

- (A) To send messages to remote relatives.
- (B) To inform the current situation to family.
- (C) To plan and organize the schedule of a day.
- (D) To share the current activities.
- (E) To share the joyful events in daily life.

4.2 Interview

There are 59 people as target users. Women account for 63%, and men account for 37%. The users all have the similar degree of family life experience, and they have already owned independent life skills. Disparity covers the period of from 20-35 years of age those who go out for obtaining employment or attending school. And it also covers the period from 35-50 year of age social workers who have already owned children.

4.3 Users' Feedbacks

(1) Home environment and the situation of members

When it mention to the living condition of users, the interview result reveals that there are (56%) of users who do not live with their families. The result represents that there are nearly half users who are independent of the original family. Furthermore, there are only 24% users who live in extended family which means living with parents and grandparents. The situation represents that it is common to see family members setting up new family independently, but they still make a good connection with the original family. Some families choose to live in the vicinity in order to maintain the convenience of taking care each others.

(2) Separated experiences with families and the connecting channels

There are (78%) of target users who have separated experience with their families for more than six months. Most of the reasons lie in attending school and having the job far from home, which reveals that family members need to study or work away from home in a certain age, and the condition causes the separation of family occurred. Thus, the most commonly used in connecting with family members is mobile phone (53%). The other is home phone (25%), which represents that the way of instantaneous contacting plays an essential part among family members. However, for the users, the mobile phone (45%) and home phone (19%) have become the most disruptive contacting tools when it mention to the level of interference. It is perceived that the current communicating way among family members causes unnecessary interference. Due to the restrictions on the use of existing media and the conditions of environment, the instantaneous transmitting mode force users to user it, and then face the interference.

(3) The way how family members communicate with each other

Family members always use different forms on coordinating and communicating with each others. However, the use of state has different sequence; there are 32% of the users tend to use exhort oral, 20% of users tend to make a note on calendar, 20% of users rely on family members reminding them trivial things, 15% of users affixes a piece of paper to a specific location, and 3% of users use mobile phone calendar to take a note. It shows that users tend to use the more simple and intuitive way when they record and arrange their trivial. Be that as it may, it is common to see the open messages be used in family. Due to open messages can be received by more people, it is permitted to use in the family where own close relationship.

(4) The sharing condition of public space

There are 67% of users who do not have experience of using the operational goods, such as bulletin board or post-it the plan the daily life. It represents that it is still not widespread when it talks to deal with family matters in public space. This kind of platform is always distributed around the corner at home, and operates independently, which make each member's channels separated. Every family member has his own independent operating platform, which makes the life experience of family cannot be overlapped, thus, the strange sense of alienation comes into existence.

(5) The alienation is caused by separating state.

In a state of separation, there are (33%) of users who feel the sense of helplessness and alienation due to separating states. Moreover, there are (25%) of users who occasionally come through this experience. It shows that when the situation is occurred, people will feel alone and look for being concerned about.

Some of the family members (39%) contact with each other every day, and some of members (29%) will try to contact with family members once a week. It reveals that users have a strong desire to maintain contacting with others, and they make contact frequently. However, an appropriate communicating media is what users are lacking of, which is also the basic needs on developing the system.

(6) The contacting relationship

However, family members will be impacted by various factors while they are concerning about each others. The factors include the relationship between each other, the frequency of getting along with or special conditions which may impact on how family members caring about each other. The result of questionnaire reveals that (30%) of users consider the kinship will affect how family members care about each other, followed by the occurrence of accident (30%), the frequency of contacting with each other (26%), and the communicating way (17%), these four factors above accounts for the four main effecting concerns. It shows that kinship has a great representative, and it decides the extent of their concern.

5. Conclusion

5.1 Effectiveness of the remote awareness system

The system which is constructed by network can be widely used throughout every corner in daily life. Through a variety of operating platforms (home laptop, office computer, cell phone) linking up the main server system, it will be more convenient to allow users to express the feelings and store it down, and being shared among different family members.

5.2 The advantages of non-instant messages

Non-instant message can give the users more using space to express the complete message.

For those who have close relationship between each other, due to the message belongs to the high level of personal privacy, it is more suitable to transmit the message in the closed family contacting system. Through reading the content of messages, family members will realize the current state of each other, and further experience the current status of other family members.

5.3 The change of using behavior-the enhancement of trigger communication

After platform being set up, the users will gradually rely on the system as the bridge of communicating with each other. The users will transfer to use the system platform on transmitting trivia or something they would like to share with family members. The system virtually enhances people to focus on transmitting messages about details of daily life and communicating with each other. With the record from other family members, they will realize other's thinking and also know further information, which advocates family members to concern about the daily events. Through the non-instant messages transmitting, the more instant messages will come into existence. Many networks are established invisibly, such as children who live outside but knowing parents

current living through the parent's content delivery. Knowing that parents will go to hospital referral next Wednesday, which makes children able to further concern about the situation of the parent's body, and this concern behavior relies on user's different angle of their desired message. The content of message no longer stays in a brief greeting, but goes much deeper in understanding the feeling of each other. This is after system established benefits is delicate behavioral change. The change of using behavior and the subtle benefits are displayed after the system being set up.

5.4 Invasion of traditional IA block

A number of network equipments have already been set up among several home appliances. For instance, digital photo frame, cyber TV, video phone, electronic desk calendar, digital kitchen, digital home appliances, network cameras, or projectors and other display devices. The basic of imaging technology is constituted by these products in the home environment, and it becomes "Ambient Display." After the visual environment of remote awareness system being attached on the physical device such as (library computer, the living room TV, touch screen in kitchen), and then it will become the contacting point in the house. Perhaps the emergence of the system will become the "family entrance system", which plays a role of information-sharing links between fixed-point devices. Different target groups also transfer and integrate the territory of existing products block. In the future, home appliance will be given a more reasonable and significant function in communicating, and also integrate domestic products for the need of wireless environment.

5.5 The common communicating channel for the disparity age

For different disparity age, due to the different backgrounds, the way of using media is definitely distinct; thus, the communicating barriers are common to see. However, for the elder, using the digital products is confused for them, which will reduce the possibility of using this kind of system. After the carrier of system which is attached in the living environment emerges, such as the digital photo frame with touch screen or the touch panel with digital camera (For instance, the upcoming product: ASUS EE-Top), Due to the simple hardware environment which connects with the message of the traditional functions (like memo stick), it allows the users of disparity age to own the same communication channel at home. The operational location can be set up in the place where family members are familiar with. The elderly can use it during watching television in living room or eating food in the kitchen. The use of different locations and also the simple interface will help the elderly to communicate with their families much easier. The system integrates the common platform which is used by family members. Moreover, it reduces users' psychological and also lowers the complexity for using.

5.6 Future Work

In the future, users will be more accustomed to this type of system. They gradually use the separated channels for different communicating targets, and also tend to use the more appropriate behavior for communicating. However, the development which can be carried out at this stage mainly focuses on constructing the communicating channel for different products. To make different forms of home supplies become the media which can load messages. Also, to connect with the message managements from different locations which make information enable to select the emerging location. The hardware equipment which combines with network will properly construct information in the environment. Not only depends on the use of traditional computer

equipment, but also progressively integrate with the area of home supplies. The communicating form of locations and mobile devices will make the messages be created and read more free and flexible than ever. The field awareness must build on the perfection of the overall environment. In addition to offer the service of transmitting information, the system also needs to develop the content to the field of perceived users. While different users enter into the home environment, they can receive the change of different information, and also obtain the information they need to know, which automatically from the interaction of environment and human. Thus, the message transmitting becomes a perfect delivery cycle. Under the environment of ubiquitous computing, people will have the aid of human social behavior due to the transform of the information in the environment. People will be guided into different levels of affection. To get rid of the current situation of users and the using situation is segregated, and make the segregation tend to become unity, and let people become much closer than before.

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