
FamCom: a Communication Service Enhancing Conversation Quality Between Elders Residing in Care Hospital and Their Family Member

Mingu Kang

Handong Global University
Pohang, Korea, Republic of
zolamanv@hgu.edu

Taewan Kim

Handong Global University
Pohang, Korea, Republic of
twave09@hgu.edu

Youngjae Kim

Handong Global University
Pohang, Korea, Republic of
klauskj@hgu.edu

Junghwan Ahn

Handong Global University
Pohang, Korea, Republic of
thinkingboy@hgu.edu

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Abstract

FamCom is a service which aids a patient in care hospital to feel more intimate with family members by improving the quality of conversation. We conducted survey, contextual inquiry, personas, scenarios and user test using low and high-fidelity prototypes to enhance the quality of conversation. According to our research lack of conversation topics depreciates the quality of conversation. FamCom provides conversation sources to family members to increase the intimacy between patient and family members.

Author Keyword

communication; intimacy; care-hospital; daily collected data;

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

Introduction

Emotional feelings felt by family members who placed their old parents in a care hospital have not been a research issue. Most of the time, these emotional

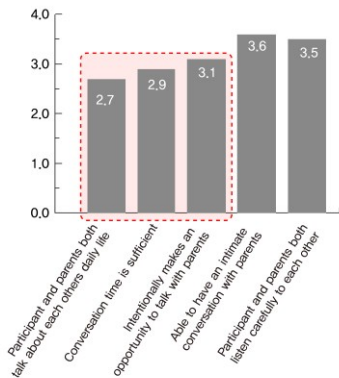


Figure 1. The lowest ranking question, "Participant and parents both talk about each other's daily life" scored 2.7.



Figure 2. We built an affinity wall to find how users currently communicate with their parents in a care hospital

experiences such as feeling distant, feeling of failure, and anxiety; caused by geographical distance, are being undermined by people related to the facility and even by the family members themselves. So our team conducted a research to find out the cause of the problem and to suggest a design solution. [1][2][3][4][5]

The design solution came out to be a service. Our service is designed to deliver the elder's information effectively by reprocessing the daily collected data from the patients to fit the perspective of supporting family members. We are expecting that our service will increase the intimacy and relationship satisfaction between patients and their family members by helping the family members to share daily information about their parents.

To solve the problem, we approached the problem through design perspective. Our design process includes survey, contextual inquiry, persona, scenario, and user test using low and high-fidelity prototype.

Based on the design process, we planned to provide a service based on smart device to solve the feeling of distantness felt by both patients and family members. We aimed to reduce the feeling of distantness by providing daily information, which is hard to obtain when living apart from each other. We have set our goal to enhance the intimate atmosphere within a family by encouraging family members to keep in touch regularly with the help of the information provided by our service.

Our smart device service 'FamCom' reprocesses daily data of the patient and delivers it effectively to family

members. Our service provides a new communication value for patients in care hospital and their families.

Preliminary Research and Survey

We conducted a survey to find out the characteristics of conversation and the degree of intimacy between patients and their family members. We targeted individuals whom are in their 40s and 50s living separately from their parents. Our primary goal of the survey was to find elements that increase satisfaction of conversation between parents and their family members. We modified the Family Adaptability and Cohesion Evaluation Scale (Faces) [6] and Communication Satisfaction Scale and applied it in our survey.

The survey was implemented to 75 people aging average of 49.66 with 6.8 standard deviation. The question "Participant and parents both talk about each other's daily life" scored the lowest with the average of 2.77(SD=1.06) and the question "Conversation time is sufficient" scored the second lowest with the average of 2.94(SD=1). (Figure1) According to the survey data, articles that reveal the will to have continuous conversation such as "Participant and parents both respect each other's opinion", "Participant and parents both listen carefully to each other" received high scores. On the other hand, articles that inform the contents of the conversation such as "Participant and parents both talk about each other's daily life" and "Conversation time is sufficient" reveal that most of the family members are having a routinely conversation. Based on the result, we concluded that the perspective of communication method and the topics of conversation affect the Family Cohesion scale and Communication Satisfaction scale. Therefore, we are

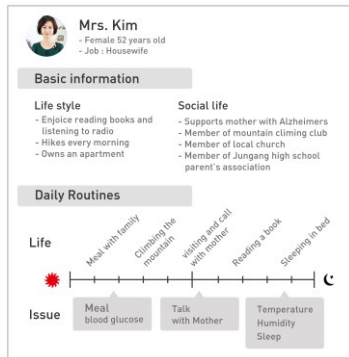


Figure 3. We developed persona to evaluate our target users.



Figure 4. Storyboards were developed to better understand how they use the Famcom.

predicting that sharing information about each other's daily life will increase the intimacy.

Contextual Inquiry

We conducted contextual inquiry to eight families, who sent their parents in a care hospital. (Figure 2) Our primary goal for Contextual Inquiry is to

- Understand overall experience of communication between the patients and their family members
- Find out what motivates conversation and to understand the contents of conversation
- Find out factors of intimacy by analyzing contents of conversation and behavior when having a conversation

Most of the participants were feeling uncomfortable for not visiting frequently enough due to geographical distance. They felt depressed especially more during national holidays, when all the family members gather together. Most of the conversations were made by phone calls, during morning and evening. Most of the conversation contents were about basic necessities of the patient such as diet, sleep, health, and social relationship. After knowing the basic necessities, participants asked for deeper questions related to the patient. This kind of conversational pattern usually does not change unless a family event occurs. In addition, participants were curious about factors that could lift up the depressed emotion of the patient such as social relationship and activities in the care hospital. In addition, participants were curious about their patients' social relationship and activities in the care hospital, which could lift up the depressed emotion of the patient.

Initial Design

According to the research data obtained from survey and contextual inquiry, we found out that most of the

families need improvement in their conversation. Our service started with a concept of 'Family Networking' to improve the scarcity of conversation topics. We developed the concept into a network service providing contents or topics for conversation using the data gathered from the patients. First, Our Family Network Service provides daily data such as sleep cycle, dietary, health state, and leisure life and professional opinion from the medical staffs. Second, families can access those information through their smart device. Overall, we designed our service for families who want to share daily life with their parents and appreciate each other, which naturally enhances the relationship. (Figure 5)

Data Gathering

We found that there are essential information that the family members want to know, such as how well the patient have slept (sleeping time and quality of sleep), how well the patient is eating (amount and list of food consumed), how well the patient is spending leisure time, and the health status of the patient. Our service collects these data and organizes it into four categories: sleep, dietary, health, and leisure. Four categories of data are composed by automatically collected data from devices used to measure the patients' health state (blood glucose monitoring device, blood pressure measuring device) and data clustered in the hospital data system, which are recorded and managed by the caregiver. For example, data such as sleeping state, blood pressure, and exercise amount can be automatically collected by wearable devices and measuring devices. And data such as diet menu, amount of food consumed, and leisures can be collected from hospital documentation recorded in the hospital data system which recorded by experts.

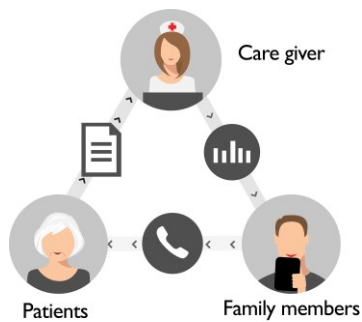


Figure 5. Data collected by caregivers is presented to the family member. Based on the data presented, family members are able to have a quality conversation.

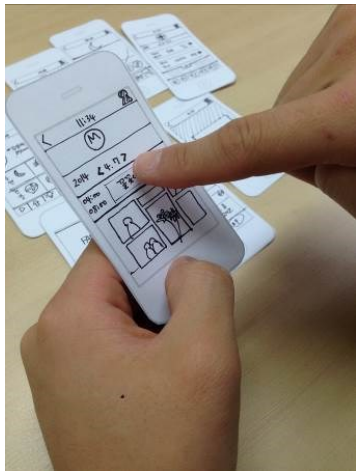


Figure 6. User testing through the low-fidelity prototypes

Visualizing Information

Collected data will be visualized on the application based on their attributes such as repetitiveness, uniqueness. For example, data such as blood pressure, and weight are measured everyday. These accumulated data are visualized by graphs, which helps to check the patient's current health state. Information is presented intuitively, since broad spectrum of users from medical doctors to non-medical professions will be using it.

Communication helper

Result of contextual inquiry reveals that information regarding basic necessities of the patient increases the quality of conversation. Therefore, information about basic necessities should be essential information. But, most of the conversation ends after asking basic necessities of the patient. The 'Note' feature provides conversation topics to the family members based on the data accumulated through 'Data gathering' feature. User can add a data, which the user is concerned of. For example, user can add the dietary data, when the patient is not consuming adequate amount of food, into the 'Note' by simply pressing the '+' button. Topic sources of conversation provided by our service, aid family members to have a good quality conversation and enhance the satisfaction of conversation.

Personas and Scenarios

Based on our pre-research and user research, we developed persona for better understanding of our target users. (Figure 3) We created storyboard based on the persona to illustrate the communication experience between patients and their families. (Figure 4) We built up tasks based on the storyboard and designed an information architecture to develop a low-fidelity prototype.

Low-Fidelity Prototype and User Testing

Our low-fidelity prototype test was conducted to evaluate the continuity of the task flow and to evaluate the suitability of the information architecture. Participants carried out five tasks using paper prototype and opinions were suggested after the test. (Figure 6)

Result

The low-fidelity test results pointed out problems in I.A. (Information Architecture) and UI. We found several contents causing confusion; overlapping contents and contents with uncertain naming. For example, most of the participants were confused about the temperature data. They were confused whether it represents local temperature or room temperature.

High-fidelity Prototype and User Testing

We used Marvel prototype tool for participants to carry out several tasks such as monitoring the four data categories (sleep, dietary, health, and culture) and using the 'Note' feature. (Figure 7) We have observed their behaviors and reactions. We added question and answer session at the end of the test to hear their overall thoughts about the working prototype. Five participants; one in two in 40s, three in 50s, one in 60s, performed the test. We considered the age and spectrum of the participants based on the future possibility of placing their parents in a care hospital. We considered the participant in 60s, as a future patient of care hospital. We widened the spectrum of participants to obtain diverse opinion. Participants were briefed with background information of 'FamCom' and the application before the test.



Figure 7. User testing through the high-fidelity prototype

Result

Most of the test participants agreed the needs of service provided by 'FamCom'. Several participants suggested that it would be useful not only for patients residing in care hospital, but also for family members living a long distance apart from each other. Participant no.1 said "I usually have nothing to talk about when I call my parents, since I do not know how they are living." He gave a positive response about the application when compared to his current experience. He also expressed the will to use the service if it turns out on the market.

Privacy issues of the patient

Participant no.2, who is in his 70s, gave a positive response about the service. He thought the service helps conversation and increases frequency of conversation with better quality of conversation. But, he is concerned that revealing information of him in detail without approval and filtering might result a negative effect. He said "It might cause his family members to worry more". So, he thinks, patient's health data should be collected according to the scope requested by the family members.

Issue of understanding medical information

Participant no.2 and no.3 had difficulties understanding medical terms. For example, blood pressure is represented in two numbers, diastolic and systolic. Such medical information should be presented with assisting information, which aids to understand the medical terms. Our application service, must contemplate adding assisting information for better understanding of medical terms.

Usability issue

Participant no.1, 2, and 3 failed to finish a task; moving listed data into the 'Note'. The participants were unable to understand the meaning of several icons, discouraging them to make an attempt. Participants responded, "It was difficult to move data into the 'Note' and applying it while having a phone conversation", since it was a new experience to them. But, once they learned how to perform it, participants were able to perform the task without any problems. We conceded tutorial or guide for the application is in need.

Acknowledging the group of end users should be enhanced. Participants in their 40s were able to finish the tasks in time, due to their high degree of intimacy with technology and smart device. On the other hand, participants in their 50s and 60s, who are not familiar interacting with smart device were unable to finish the tasks in time. (Figure 8)

Due to low visibility and recognition, task five (adding information in the 'Note') and six (conversation using the 'Note') took the longest time compared to other tasks. In addition, users were also confused due to vague icon color and size.

In addition, no.4 said "Was not sure whether the information was added into the Note" and "There was no response when I pressed this button". This opinion points out an overall problem of feedbacks confirming user's interaction. Also, icons should be re-designed, since icons for 'Leisure' and 'Note' caused confusion.

Final Design

Our final design displays current sleep cycle, dietary information, health information, and cultural life of the

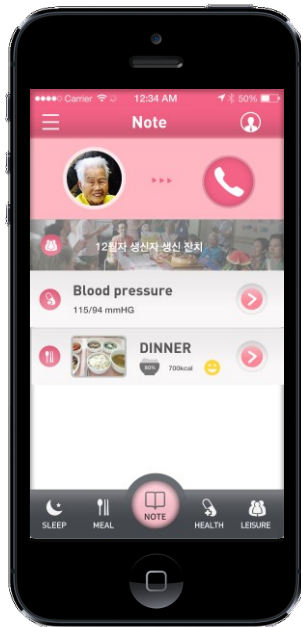


Figure 9. By using the 'Note' Famcom helps communication between elders in care hospital and their family members

patient. We clustered the data collected from context inquiry and prototype user test into four categories. Each categories are visualized into texts, graphs, icons, and images according to their attributes for high visibility and availability.(Figure 8)

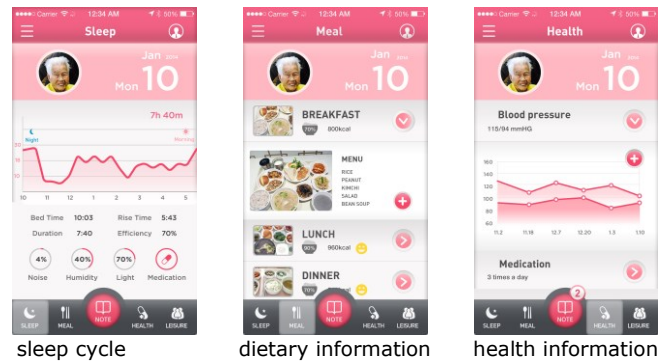


Figure 8. Famcom collects data and organizes it into four categories: sleep, dietary, health, and leisure.

The 'Note' feature provides a function of saving specific information. It provides topic sources when having a conversation with the patient.(Figure 9)

Conclusion & Discussion

Our goal for this research is to design a service (FamCom) and overcome the feeling of distantness for families who have sent their parents to a care hospital by providing medical and daily information. We found out that conversation between a patient and family members becomes mundane and formal as time goes by. We suggested a design solution to increase the

satisfaction of conversation. We acquired a pleasing result through the user test.

Additional study is recommended to analyze intimacy between family members, which we have mentioned earlier. The study should be conducted with cutting-edge working prototype performed by recruited volunteers, whom are in situations of caring their parents.

Our team limited the smart device to smartphone for our research. As IoT(internet of things) and wearable devices are being developed, suggesting a device or media closely related to users daily lives for efficient communication will be a good field of study.

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