DEVELOPING A FRAMEWORK OF NEW MIXED METHOD, SOCIAL NETWORKING SERVICES GROUP DIARY AND ITS APPLICATION IN PRACTICE

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Abstract

As understanding use context is considered a key factor to deliver better user experience, designers have spent much time and money investigating the context. Despite the presence of various user research methods, it is still insufficient to figure out the context of use in actual situations. On the other hand, as Social Networking Services (SNS) based on real time interaction have been popular, its potentiality as a research method has been spotlighted. Under this circumstance a framework of new mixed method, SNS Group Diary, was developed in which SNS technology was applied to better capture the real time use context. Therefore, this paper presents an empirical study that includes a case study on multi-refrigerator that was conducted through SNS group diary. For the study eleven housewives were recruited and an experiment was conducted for two weeks to prove the validity of the new method. The overall results indicate that SNS Group Diary is an effective method to figure out the actual use context. The implications and limitations of the SNS Group Diary are discussed as well.

Keywords: Design methodology, SNS, User centred design, use context

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1 INTRODUCTION

Emotional and socio-cultural functions of the product have been emerging as an important factor that designers should consider. With those changes, the range of product design is expanding from passive perspective; focusing on product itself and improving it – to active perspective; understanding user context, identifying users needs and suggesting a new use scenario. The best companies seem to try to uncover customers and users needs and wants that can be translated into new or improved product or service offerings (Eisenberg 2011).

Even though various types of research methods have been used to figure out use context (see figure 1), most of methods have its own limitation. For example, in case of focus group interview, it aims to draw upon respondents' attitudes, feelings, beliefs, experiences and reactions in a way in which would not be feasible using other methods; observation, one-to-one interviewing, or questionnaire surveys (Gibbs 1997). Similarly, mobile device-based diary studies have potential as contextual data capture methods that address the limitations of the traditional paper-based diary method (Sun *et al.* 2013). Therefore, combining one another methods, i.e., using a mixed method is recommendable to complement defects and overcome limitations of each method(Son *et al.* 2005). While there have been a number of studies that demonstrate the power of the mobile device-based diary approach, there is less known about participants' experience of such studies.
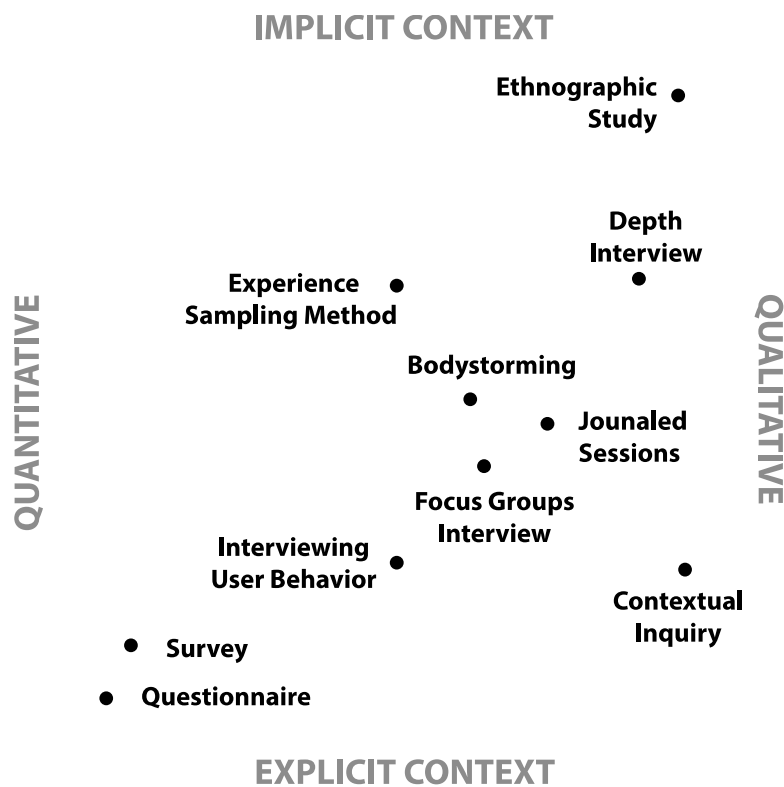

Figure 1. Positioning map of user and context research methods (Son et al. 2005)

1.1 Popularity of SNS and its potential as research tool

Social Networking Sites (SNSs) has rapidly become an essential part of daily lives to millions of people all over the world. User generated contents, based on SNSs such as photos, videos, social bookmarks, and blogs, have been flooding by taking advances of easy access without any expert skill (Bae *et al.* 2013). As most contents created by people remain largely untapped (Asur and Huberman 2010) and the availability of such content increases, identifying those contents becomes important and useful (Agichtein *et al.* 2008). According to a study by (Ellison 2007), it was said " Social network sites (SNSs) are increasingly attracting the attention of academic and industry researchers intrigued by their affordances and reach" and it indicates SNSs have a possibility for being utilized in research.

In fact, studies from various fields have been utilizing SNSs in order to collect data for their own purposes. For example, it was reported that the overwhelming number of companies have experienced of using social media as a marketing tool (Stelzner 2011) and there are some cases of using social media for promotional roles in the marketplace in a sense that social media makes it possible for companies to talk to their customers as well as customers to communicate to one another (Mangold and Faulds 2009). Moreover, considering that social media enable individuals' connectivity and users' direct participation (Chou *et al.* 2009), there was an related study in public health departments to assess: the extent to which state public health department are by using social media; (Thackeray *et al.* 2012) Also, as people have used social media as tools to broadcast their day-to-day happenings, or to report on an external event of interest, using social media contribute to understand the rich 'landscape' of moods and help us better interpret and make sense of the behavior of millions of individuals (De Choudhury *et al.* 2012). Considering those aspects, there are a lot of benefits and potentials in Social networking sites as research method for figuring out user context. First, it is easy to filter and recruit target people with criteria because people show their interests and daily behavior through social media and also it is based on online worldwide networking. Also, SNSs enables to gather various types of data from many samples at the same time such as photo, videos and diary journals, which contributes to understand rich experience in terms of user research. In addition, it makes it possible to communicate people individually and directly whenever they want (real time) thanks to easy access and 24/7 openness.

Even though SNS has been prevailing these days, the research using it has not sufficiently conducted. As an attempt to overcome limitations of conventional research methodology, this paper proposed a new mixed research method for investigating use context by combining new technology, Social Networking Services, with existing methods. In addition, concentrating on the feature of SNSs, daily practices and networking.

1.2 Purpose of the study

The main objective of this research was to utilize SNS for developing a new research method, especially focusing on the benefits of SNS: the real time accessibility and the possibility of new research method. Specifically mobile group diary based on Social Networking Service (SNS), as methodological tools to elicit user needs and to figure out actual product usage in real life setting. The key research questions were 1) how effective using SNS is to observe 'diary method' in terms of real-time interaction, 2) what benefits are of utilizing various types of data such as text, photo and pictures to elicit users needs and problem.

2 METHOD

2.1 Framework development

To utilize SNS as a key foundation a research method, two existing qualitative research methods - diary method and focus group interview - were selected and combined to propose a research methodology. In case of diary method, it has similarity with SNS in that both are based on daily practices (Ellison, 2007). In case of focus group interview, on the other hand, it allows designated users to share a connection and discuss what they think and feel about experience. In this study, SNS group diary was developed for the study to apply SNS for a mixed research method to observe product usage pattern and find problems and needs. As the name of the method refers, it is based on an online virtual space not physical space, which contributes to provide more convenience and efficiency to collect data regardless of participants' residence. It is expected that participants upload daily-recorded data such as photos, images and descriptions in designated online space through Internet or smartphone. In addition, it can utilize online networking service for group interaction so that participants can share their opinion about certain topic like focused group interview method (Frey & Fontana, 1991). Based on those possibilities, SNS group diary is expected to become an effective method to elicit insights from users as an integrated version of research methods.

2.2 Instruments

Multi-door refrigerator (see Figure 2), defined as a refrigerator which has more than 4 doors, was selected for a case study for these reasons: 1) In case of multi-door refrigerator, it is relatively a difficult consumer product for a research instrument in that it belongs to bigger size of home appliance not a portable or handy product. Also, 2) research for refrigerator needs to be conducted in users' natural context because how to use is literally dependent on 'user' who puts food and arranges it, and 3) the position, structure and size of the product are various and different among users. In addition, 4) it has recently been released in market so related research on usability or usage patterns has not sufficiently been conducted.
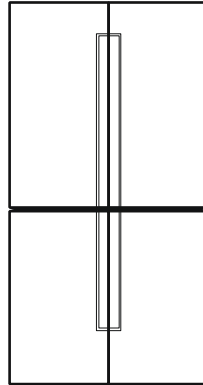
Figure 2. Multi-door refrigerator

2.3 Sample

A total of 11 housewives who had bought and have used a multi-door refrigerator participated in the study (Figure 3). They were divided into two groups according to the period in marriage: 6 - married for more than ten years, 5 - married for less than two years; it was assumed that people who have experienced in marriage and household for similar period would have common interests and similarity in the way they use the refrigerator. Those who agreed to participate in the study were recruited through online communities or through the network of researchers. Two weeks were spent to get enough amounts of sources considering food consumption cycle.
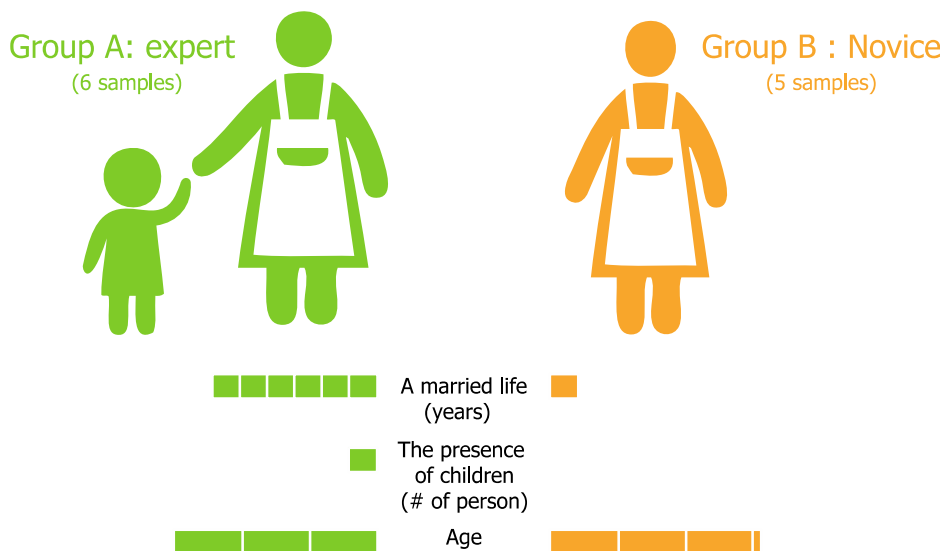
Group A: expert
(6 samples)

Group B : Novice
(5 samples)

A married life
(years)

The presence
of children
(# of person)

Age

Figure 3. Demographical characteristics of participants

2.4 Procedure

As a data collecting apparatus, *Naver Café*, one platform of the most famous closed SNSs in Korea, was utilized to create online space for the two groups; in case of open-space SNSs such as Facebook, or Twitter, it has possibility that privacy of participants could be easily leaked to others and it could interrupt and influences participant' behavior so we selected closed SNS instead. In addition, it is accessible through smartphone as well as PC and there is no limitation of data capacity of uploading pictures or text. Each participant was asked to conduct and upload assigned tasks – daily and intermittent assignment, which was specifically described below figures (see Figure 4).
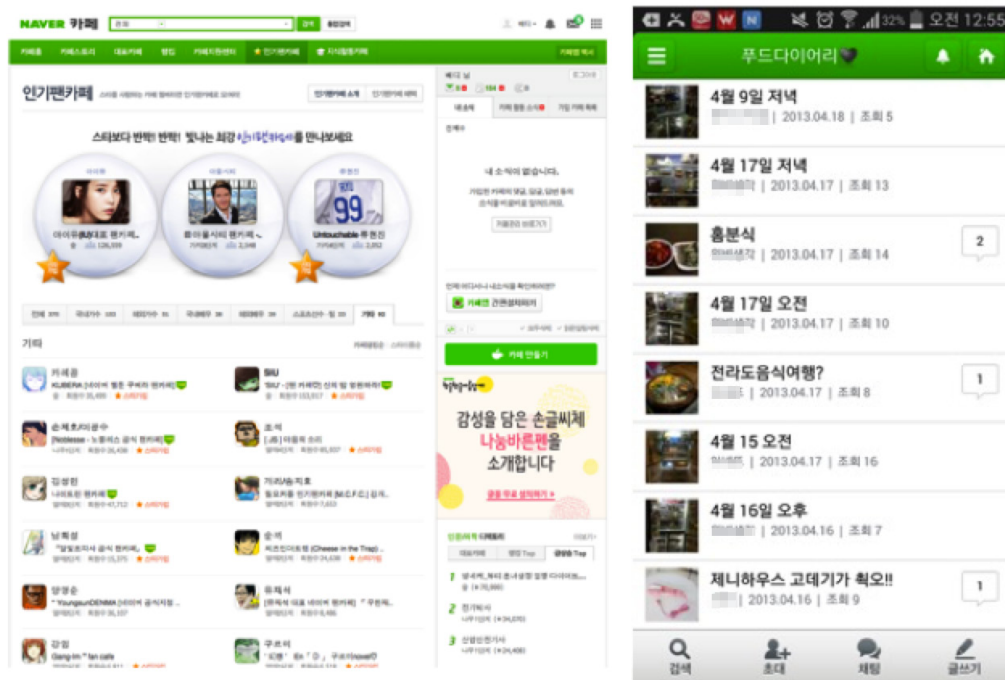

Figure 4. Interface of mobile diary (Left - PC, Right – mobile)

2.4.1 Daily task:

Take pictures of refrigerator with description twice a day (morning and evening) (see Figure 5). This task was aimed at observing practices of putting in and taking off food in refrigerator. As a way of observation, participant-create-photograph was selected as resources of observation and we asked them to take pictures twice a day, in the morning and in the evening after finishing having meals. As it is important for diary method to have detailed training sessions for making participants fully understood (Reis and Gable 2000), we provided a guideline of taking pictures and other details on the designated online space. Participants were required to describe the categories or types of food as well as the specific location they stored in when they uploaded their own photographs. Through pictures, we were supposed to analyze an individual's typical or average usage pattern, and figure out the differences among participants.

Figure 5. Examples of daily taken photographs of a user's refrigerator

2.4.2 Intermittent task:

Introducing what they bought for food whenever they purchased (see Figure 6)

As a part of understanding related context and situation to using refrigerator, we required participants to explain whatever they bought for food. The purpose of the task was figuring out participants' dietary habit and observing way to organize food items into refrigerator after purchasing items.

Figure 6. Examples of a picture of what they bought for food

Online chatting with group members

11 participants took part in an online focus group chat with five open-ended questions. It was held in online chatting room provided by Naver café, a program that facilitates online engagement and interaction with members. It was used to enable participants to interact from any computer, from any location, at any time.

3   RESULT

Utilizing SNS group diary over two weeks resulted in obtaining data from participants: a total of 297 main images of refrigerator and 1508 comments. The amount of data indicated that the use of SNS group diary for research method resulted in producing rich data simultaneously from a number of participants.

3.1 Collecting of credible data on a daily basis

Daily collected photographs were used to figure out the usage pattern in the multi-door refrigerator. The analysis was carried out through three processes (see Figure 7). At first, we identified all items in the refrigerator and traced changes according to time sequence; focusing on the activities in refrigerator such as frequency of movement within spaces, adding in and taking off food. After then, it

was possible to classify main food categories a participant usually consumed and discovered the characteristics of each space, focusing on the relationship between the food category and the space.
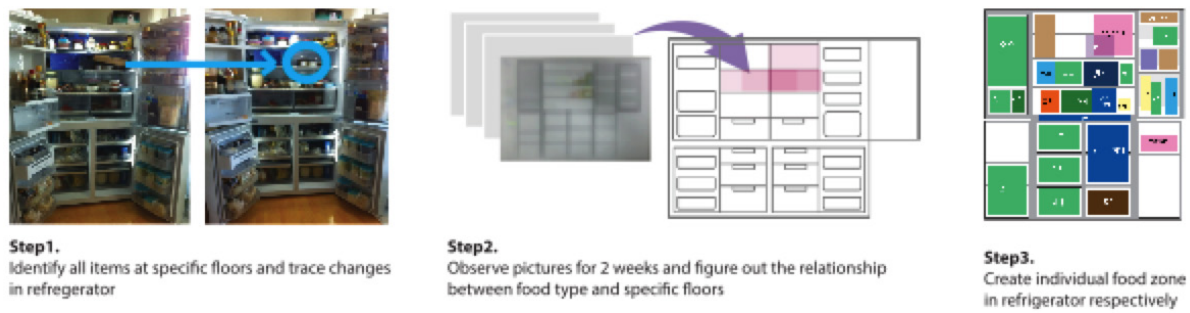

Step1.
Identify all items at specific floors and trace changes in refrigerator

Step2.
Observe pictures for 2 weeks and figure out the relationship between food type and specific floors

Step3.
Create individual food zone in refrigerator respectively

Figure 7. Procedure of analysis of data

In addition, through tracing of movement of food items, we figured out a space where participants deliberately emptied in case of unexpected storing food; we called it *flexible space*. After considering all factors, we created 11 individual *food mapping zone* in the multi-refrigerator. When comparing all participants' food mapping zone, each participant showed different dietary life and usage pattern respectively. However, one of the most noticeable points of the analysis was the size of flexible space (see figure 8) with dashed line. Participants, who showed tendency of keeping their own rule of thumb in arranging food, had relatively small size of flexible space – 5 out of 11 participants. On the other hand, those who showed relatively loose rules of organizing items showed tendency of emptying more spaces in refrigerator – 5 out of 11 participants. In a sense that the result was based on actual usage pattern in 'natural context' in perspective of real user, the finding obtained high credibility and validity unlike data from laboratory-setting based research. In addition, daily produced photographed data through SNS group diary contributed to investigate daily and weekly usage pattern and create individual food mapping zone based on them.

Figure 8. Two types of flexible space in refrigerator

3.2 Interactive feedbacks allowed further understanding of problem types:

We collected text-based data through interactions between participants to participants and between researcher to participants: 1508 comments and two transcripts about online Focus Group interview of two groups. When it comes to interaction, SNS platform provided effective passages to connect participants and researchers because it was useful to ask a question or doubtful point to them whenever something curious came to mind.

Interactions between researcher and participants frequently occurred throughout all tasks they uploaded. Also, the activity of giving and providing feedbacks between two persons occurred within less12 hours, which indicated the feature of data: relatively instant rather than retrospective in a sense

that it took less than 1 day. Those interactions and feedbacks through comments significantly contributed to understand specific reasons of certain behavior and detailed problems they experienced. Moreover, as all data was based on photographs, description and comment at the same time, it was possible to comprehensively understand of use context.

The qualitative content analysis method (Graneheim and Lundman 2004) was used to analyze text-based data; firstly, all verbatim were transcribed and each sentence was segmented according to its meaning unit. Then to gain insight, we developed an affinity diagram based on similarity of units and specific locations, which contributed to figure out the relationship between problem types and related spaces in qualitative datasets. To develop affinity diagram, two of researchers, worked independently.

As a result, a total 28 categories was created and those of problems and needs were classified in three types (see Figure 9); functionality/usability problem caused from malfunction of product, emotional and cognitive problem that evoked negative emotions of inconvenience to users', and general needs and wishes about the refrigerator
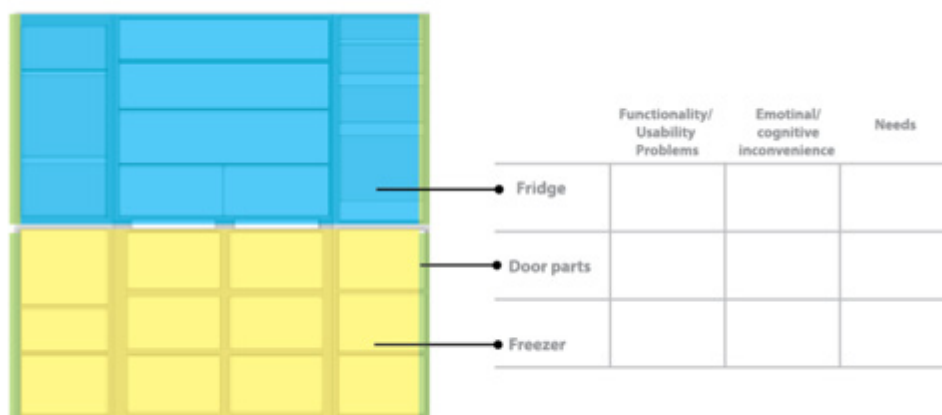

Figure 9. Result of affinity diagram

4 DISCUSSION

4.1 Benefits of SNS group diary

One of limitations of conventional diary method was that it was hard to collect reliable and valid data in that it completely depended on participant commitment and dedication (Bolger *et al.* 2003). However, in case of SNS group diary, whether participant conducted assigned task or not was able to be checked daily (see figure 5), which stimulated participants to complete taking pictures of refrigerator everyday. Actually, 8 out of 11 participants completed taking 28 pictures in time over two weeks, which indicated the data gathered through this method had high credibility with little possibility that data had been distorted. Even though the others missed uploading several pictures, they also complemented tasks by extending days.

A mixed research method applied SNS media, SNS group diary, was used in this study for observing how real users to use their own multi-refrigerator and eliciting their needs and problems in the middle of using it. In terms of collecting data, using this method offered great conveniences; the data given from participants were automatically saved into database on designated space without effort to transform it, and also it was possible to analyze data immediately unlike conventional diary method – analyzing data only after gathering all data. Also, it was effective to ask a question or doubtful point to them whenever something curious came to mind. Finally, SNS played an important role to provide motivation to participants as an encouraging way to conduct task. The strongest point of using a SNS method was it contributed to reduce cost and time for research. Even though the residence of all participants was different, it was possible to contact them through Internet not person-to-person and gather data on online space not physical space, which increased higher efficiency.

4.2 Limitation and further study

However, there were limitations in the study; in the process of recruiting participants, it was not conducted by random sampling; it was conducted by mobilizing volunteers among targeted actual

users who were active in online community or finding users through the network of researchers. This was inevitable decision in a sense that recruiting actual users through random sampling was almost impossible considering the feature of the product; in case of multi-door refrigerator, it belongs to recently-released products in the market, and also it is not ordinary consumer products which product cycle is relatively short, such as smartphone or small home appliance. In addition, the number of groups was insufficient but considering this study aimed at validating a research method based on a qualitative analysis, it could work as a foundation stone of utilizing SNS group diary.

Another point to consider is that it is important for researchers to induce one's participations by giving constant feedback and stimulating motivations when they are planning to utilize the method based on SNSs. While laboratory setting research is easy to control participants or handle research materials by person-to-person, SNS research method is carried out virtual space where researchers and participants meet indirectly. It indicates even though SNS allows to check whether participants conducted assigned tasks or not, the participation can be dependent on the will of participants. In order to encourage them to be fully involved into the study, giving motivation such as using rewards or updating tasks is recommended.

More work is possible to use various sources of SNS data such as video, photos, social bookmarks, and blogs. *SNS group diary* is an early version of a research method utilizing the benefits of SNS, so it needs improvement and revision for versatile use. In the study, we just tasted the benefit of using SNS as a research method conducting a case study, which means there are still a lot of potentials taking advantages of the method to understand the actual use of various consumer products.

5 CONCLUSION

As an attempt to overcome limitation of conventional qualitative research method, this paper introduces a new mixed design research methodology, SNS group diary. The main benefit of the method is that it is possible to figure out 'actual product usage' of daily products in natural setting in 'real users' viewpoint not based on laboratory-setting environment. Multi-door refrigerator was selected for several reasons for a case study to validate the new methodology whether it is effective to figure out usage pattern and elicit needs and problems of the product. Eleven housewives, who had bought and used it, were recruited and asked to conducted tasks over two weeks on the platform of a closed SNS. As a result, SNS group diary enabled to collect daily produced data and contributed to create each participant' food mapping zone in refrigerator by analysing data by time sequence. In addition, instant feedbacks and comments accompanied by photographs were useful to analyse use context and find the problems and needs. Applying SNS as the foundation of a research method resulted in a huge amount of data and discover daily-basis actual product usage. Moreover, using a SNS method was highly efficient in that it contributed to reduce time and cost for research.

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