A Study on Application of Ethnography for the User Research in Designing Korean Express Train

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Abstract

Ethnography, a major research method in Anthropology, has been recently applied in human-centered design research. Since ethnography has empirical, naturalistic, holistic and eclectic characteristics, it is needed a guideline to apply ethnography into design research in accordance with a characteristic of project. Design project in which ethnography is applied can be categorized by two criteria; degree of newness of project goal(existing user – potential user) and limitedness of worksite(site-oriented – work-oriented). Among work-site activities, technology in use, and user group culture, it should be decided which content to focus more than others and thus what kinds of research techniques to apply in the ethnographic research

Case study was to design an interior of a Korean express train. This project is site-oriented and has an existing-potential users. Therefore, video ethnography was effectively applied to obtain chronological data of activity flow, and participant observation was applied to obtain statistical data of synchronous activities. Case study shows a concrete process example of how to apply ethnography into design research.

Keyword : Ethnography, Video Ethnography, Participant Observation, Korean Express Train, Human-Centered Design Research

1. Introduction

Ethnography, a major research method in Anthropology, has been recently applied in human-centered design research. However, every design project can adopt step-by-step process of ethnography in the same way, for ethnography should be applied to the project in accordance with a characteristic of the project. Therefore, It is necessary to identify criteria through reviewing and categorizing design project in which ethnographic research is conducted. The objective of this paper is to find criteria to categorize project in order to establish a guideline to apply ethnography in accordance with a characteristics of the project

In this paper, the concept of ethnography is outlined as a material to grasp the idea of what ethnography is. Then, the focused contents of design project will

be figured out by the criteria for categorization which are figured out from the characteristics of design projects in which ethnography was applied since now.

In order to show a concrete application process, a case study of ethnographic research is demonstrated in designing an interior of Korean Express Train.

2. Definition of Ethnography

Ethnography as a process[1] is one of several general research methods used by Social Science to study the shared beliefs, practices, artifacts, folk knowledge and behavior of a group of people, in other wods, culture. Anthropology, in particular, claims that ethnography is its main method, so that sometimes, ethnography is equated with an anthropological fieldwork, or participant observation. However, besides anthropology, ethnography is used in other Social Sciences such as sociology, history, and political science in order to elicit the connection between the micro reality and the macro theory.

In many respects, ethnography is the most basic form of social research. Not only does it have a very long history (Wax 1971), but it also bears a close resemblance to the routine ways in which people make sense of the world in everyday life. Consequently, the ethnographic researcher begins by examining even very commonplace groups or processes in a fresh and different way, as if they were exceptional and unique (Erickson 1973). This allows investigators to discern the detail and the generality that are necessary for a credible research.

There are various explanations as to whether ethnography's distinctive feature is the elicitation of cultural knowledge (Spradley 1980), the detailed investigation of patterns of social interaction (Grumpez 1981), or holistic analysis of societies (Lutz 1981). Sometimes ethnography is portrayed as essentially descriptive, or perhaps as a form of story telling (Walker 1981); occasionally, by contrast, great emphasis is laid on the development and testing of theory (Glaser and Strauss 1967; Denzin 1978).

There are four distinctive features of ethnography. First, ethnography is empirical, which means ethnographers acquire data through lived experience during a fieldwork.

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1 In addition to being a method, ethnography also refers to a final product as a form of writing. Ethnographies are analytic descriptions or reconstructions of cultural scenes and groups. (Spradly and McCurdy 1972) However, since I am concerned with ethnography as a method in this paper, I will leave out another aspect of ethnography as a genre of writing.

Second, ethnography is naturalistic. Ethnography is used to acquire firsthand, sensory accounts of phenomena as they occur in real world settings, and investigators take care to avoid purposive manipulation of variables in the study. 'Artificial' methods such as experiments and survey interviews are incapable of capturing the meaning of everyday human activities.

Third, ethnography is holistic. Ethnographers try to grasp the larger configuration of society, nature, and meaning. (Peacock 1986). Ethnographers, especially anthropologists traditionally attempt to treat the group's life as a whole – not to isolate some Finally, ethnography is eclectic or multi-modal; ethnographers use a variety of research techniques to amass their data (Wilson 1977). Ethnographers use many types of data collection techniques, so that data collected in one way can be used to cross-check the accuracy of data gathered in another way.
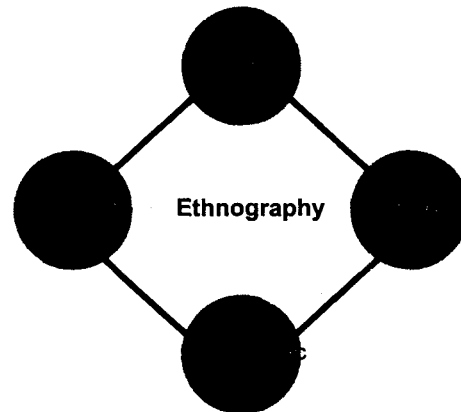

Fig1. Four Characteristics of Ethnography

3. Categorization of Design-Ethnography Project

There are two criteria to categorize design project in which ethnography is applied; one is the degree of newness of project goal and the other is the degree of limitedness of worksite. At first, by the degree of newness of the project end-goal, there are two poles; existing user and potential user. In the research to target existing users and existing products, ethnography is applied to understand the existing work process better and, then to design a more suitable product to users. In the research to target potential users, ethnography is applied to get credible information about hidden needs of potential users and settings in finding new design problems and systemic solutions of them. Second, by the limitedness of worksite, there are two poles; site-oriented and work-oriented. In site-oriented research, there is a particular site where user activities are

taken place, so that ethnographic research can be conducted within the particular site. In work-oriented research, there is no particular sites.

The following diagram shows categorizing focused contents of design- ethnography project by two criteria explained above.

Site-oriented

Worksite Activities	
Technology in Use	

Existing User   User Group Culture   Potential User
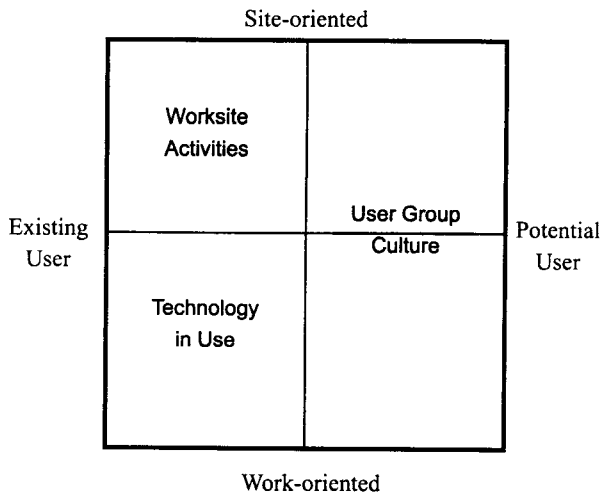
Work-oriented

Fig.2 Categorization of focused contents of design-ethnography projects by two criteria

At first, in existing user and site-oriented project, worksite activities in limited area are focused. The examples of this kind of project are interior design or product-system environment design projects. There was a project to design an air traffic control room conducted ethnography by Harper, Hughes and Shapiro in 1991. In this kind of project, the focus of ethnographic research is to understand in detail how users do complicated and various activities inside the setting. Therefore, video ethnography with a fixed camera, which make possible observe detailed activities without omission, can be effectively applied.

In contrast, since there is not restriction in workplace in existing user and work-oriented project, the focus of ethnographic research is to understand technology in use around users. As an example, there can be a project to design mobile information and communication product or service such as mobile phone. There also can be a project to deal a work which take place in virtual space such as an internet site and software product. In this case, ethnographic research can be applied to verify the usability of the software and to adjust it. There was a project to design programming system to end-users in which an ethnographic research was applied to study end users to use spreadsheet software and CAD software by Nardi and Zarner in 1990.

To target potential users means to let design solutions open to various possibilities, no matter whether it is site-oriented or not. In other words, there is no limit or boundary of end product of the project and it is needed to generate conceptual ideas that are never existed. For example, there was a project to design new image processing technology by Lucy Suchman and Randy Trigg, in 1994. In this case, ethnographic research was focused on the user group culture in general and took an important role to forecast a direction for the new technology. Particularly, extensive and intensive ethnographic research should be effectively applied to figure out analytical and interpretive framework on the subject of the project, instead of applying technical framework merely.

In the above, three categories of focused contents were figured out by two criteria; degree of newness of the project goal and limitedness of worksite. However, three areas are not clearly separated. In fact, all of three contents can be produced from one ethnographic research. It is needed to decide on which content to focus and which techniques to use in accordance with project characteristics.

In the following chapter, a case study on designing an interior of Korean express train shows more concrete example on how to categorize project characteristics and what techniques can be selected to apply.

4. Case Study

4-1. Contents and process of the case study

This ethnographic research is to study user activities in naturalistic usage environments and situations. Therefore, data on passengers' activities in Samaul-train were collected. Then, activity model on frequent and particular activities are produced from analyzing data. By asking why to user activities, hidden needs and ideas for the design solution were generated.

The actual process of the case study is as follows. First, pilot test of participant observation was conducted. This contains mainly note-taking and little of picture-taking. This pilot test takes an important role in establishing research framework in the next step. Research framework contains technical framework about how to apply various ethnographic techniques and thematic framework about what to focus. In this planning stage, it is needed to decide up to very detailed parts such as where to set cameras.

Second, the main step of ethnography, which is data collection, was conducted. Assumed that main user

group of Express train will businessmen, representative time can. be day during weekdays. Thus, data collection was conducted and repeated if necessary with the basic unit of a round trip from Taejon-Seoul(3 hrs) during weekdays.

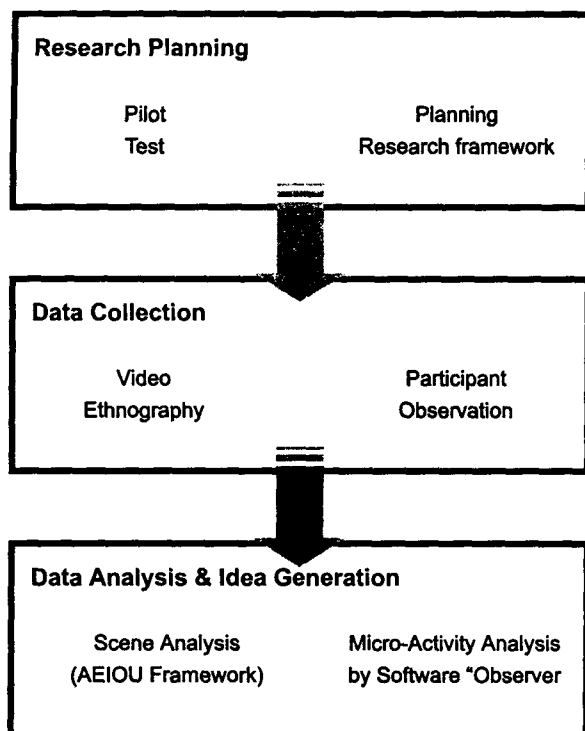Third, collected data is now being analyzed with idea generation session.

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│  Research Planning                       │
│                                          │
│     Pilot              Planning          │
│     Test               Research framework│
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                    ▼
┌─────────────────────────────────────────┐
│  Data Collection                         │
│                                          │
│     Video              Participant       │
│     Ethnography        Observation       │
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                    ▼
┌─────────────────────────────────────────┐
│  Data Analysis & Idea Generation         │
│                                          │
│   Scene Analysis      Micro-Activity Analysis│
│   (AEIOU Framework)   by Software "Observer│
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Fig 3. Ethnographic research process

4-2. Technical framework of Ethnographic Research

By the first criteria, degree of newness of project goal, designing an interior of Korean Express train can be positioned in the middle of the map. It is because the end goal is new in Korea, but it is not in several countries and exiting users are also indistinguishable from potential users.

By the second criteria, degree of limitedness of worksite, this project can be come under perfect site-oriented project. Therefore, video ethnography had to be a major technique to apply. As a supplementary research, participant observation was also conducted to get statistical data related to numbers of people doing a kind of activities. Participant observer also took zoomed-in pictures of physical environment that are hardly caught by the fixed video camera.

Interviews or other interactive techniques were not included in accordance with objectiveness of this project.

4-3. Thematic Framework of Ethnographic Research

Since a passenger train consist of an interior and a corridor, two fixed cameras are needed to record people's activities in the two space. The activity can be divided into two kinds; chronological activity flow, which means a persons activity flow from the point he get on the train to the point he get off the train, and synchronous activity, which means kinds of activities people doing at the same time in the one passenger train. Chronological activity flow data was effectively obtained by video ethnography and statistical data about synchronous activity was obtained by counting people doing a kind of activity by participant observer. The synchronous activity was observed around the components of physical environment, which are seat, foot rest, table, curtain, leg supporter, hanger, light, window, baggage lack and so on. The categories of statistical data about synchronous activity are as follows.

- ratio of male passenger to female passenger
- ratio of people doing each activity among all kinds of activity
- angle of seat lying(# of maximum/medium/no lying)
- usage of table(# of eating with table/other cases/trace of eating)
- usage of foot rest and leg supporter(# of using foot rest and leg supporter with/out shoes)
- usage of hanger(# of used hanger)

4-4. Data Analysis Method

User activity is analyzed by AEIOU framework. In other words, user activity should be told as a situation in which who(user) did what(activity & interaction) with what(object) in where(Environment). Then, if there is some question about why, assumed answer or particular remarks about it should be written down. These descriptions of the scene are sources to be developed to design ideas.

Especially, chronological activity flow is being analyzed by software named "Observer" developed by Noldus which is often used in the field of behavioral science. Chronological activities of several people in the train can effectively be analyzes by multi user analysis provided by the software. The following picture is the sample screen of observer.
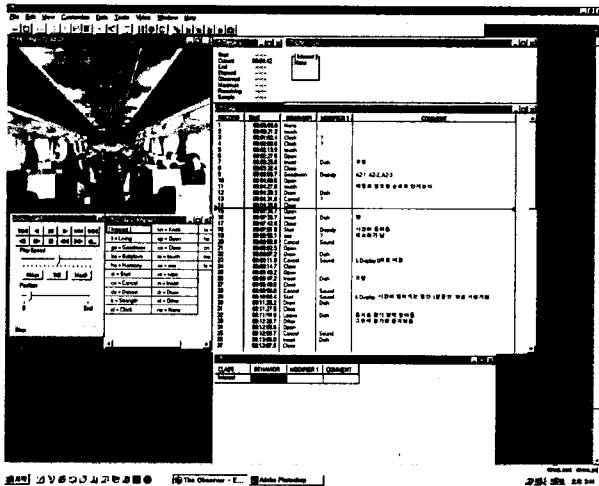
Fig 4. Sample screen of data Anlysis by Noldus "observer"

5. Conclusion and Further Prospects

In this paper, two criteria was identified through reviewing and categorizing design project in which ethnographic research is conducted. It is also established a guideline how to apply ethnography in accordance with a characteristics of the project. Then, the case study shows the concrete example of a process of an ethnographic research. Because the express train project is still progressing, analyzed data could not be displayed in this paper. However, after all the data are analyzed and ideas are generated and clustered, more full-scale discussion for the effectiveness of applying ethnography in design research can be employed.

Even though researching Korean culture was not directed in the case study, some was needed to know in order to design seat direction. It might be clarified by survey or interview, which was not included in the research above.

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