

# How to Observe, Share and Apply in Design Process?

## Focusing on International Design Workshops as a Case Study

Namgyu Kang and Hidetsugu Suto

116-2 Kamedanalano, Hakodate, Hokkaido, 014-8655, Japan  
kang@fun.ac.jp

**Abstract.** These days, many people in design field make a great point of observing a user with regard to the user's circumstances. From the background, there are many researches in User Centered Design field about the role and value of the observing in design process. However, there have been a few researches about how to observe users and how to share and apply the observed results to design process more effectively. The purpose of this research is to clarify the following hypothesis: 'Observing "Physical factor", "Kansei factor" and "Cultural factor" from different viewpoints, and visualizing and sharing the observed results does not help only to understand users' needs but also to apply the observation results to design process.' Therefore, in this research, we discuss 1) the role of observing from different viewpoints, 2) the validity of the following three factors, Physical factor, Emotion factor and Culture factor as the subjects of observation and 3) the reconfirming "TTS method" to visualize and share the observed results, based on several international design workshops as a case study. As the results, the observation from different viewpoints is effective to find out users' needs including a potential needs which is difficult to be found out through the questionnaire survey. And the method to observe Physical factor, *Kansei* factor and Cultural factor helps to understand users' situation and needs. Moreover, sharing the visualized observation results with TTS method becomes easy to understand others' thinking, and easy to apply the observed results to design process.

**Keywords:** Observation, Culture, Sharing, Design process.

## 1 Introduction

A questionnaire survey is one of the most commonly used research methods by researchers when they try to explore a user's opinions and needs. However, it is difficult to find out the user's potential needs with the questionnaire survey. Observation in a design process is a useful method to know the user's various types of needs including potential needs. *Matsunami* and *Merholz's* research teams emphasized the importance of observation in users' experiments in their daily life. Regarding the importance of observation, *Kelly* of IDEO noted "Seeing and hearing with your own eyes and ears is a critical first step in improving or creating a breakthrough product." *Kang's* research group also indicated that observation is one of the most powerful methods to find out a user's potential needs that is hard to be verbalized.

Consistent with these previous studies, there are many other studies that discuss the role and value of the observation in the design process (especially User Centered Design (UCD) field). However, there has been a lack of research that explored how to observe, how to share (part of reason is that most cases of design works are conducted as a team or group work.), and how to apply the shared observation results to design process effectively. In other words, we, designers, should consider not only “Relationship between designer side and user side,” but also “Relationship between design team members” for better design.

Based on the mentioned backgrounds, *Kang* conducted several design workshops and found out that “Different viewpoints on observing process” helps to find out the user’s various needs, including potential needs from his/her daily experiences. Each participant has a different nationality and major. It means that each one has a different viewpoint from their different experiments. There are many new discoveries on the observation process through different viewpoints.

However, many participants in the design workshops could not conduct an observation effectively. Kelly of IDEO said that a designer should give a “Deep Dive” into the observing process. To borrow Kelly’s phrase, many participants give a “Shallow Dive” into their observing process, even though they used much time in observing users. Furthermore, although some groups in the design workshop had obtained rich information from their observation, they couldn’t share the observation results and apply the shared results to their design processes. Despite the fact that they had known the value of observing, they didn’t know specifically how to observe, share, and apply to their design process effectively.

The purpose of this research is to explore the method of how to observe, share the observation results, and apply the shared results to design process effectively through some international design workshops as a case study.

## 2 Literature Reviews

### 2.1 Different Viewpoint on Observation

UCD involves careful observation of users’ experience in order to facilitate appreciation of their viewpoints. The process helps designers to create a new idea to solve a problem in our daily life. According to *James*, different viewpoint in observation is very important in a creative process. *Brown* emphasized the observation with multidisciplinary team in design process. *Ashikawa*’s research team reported that personal characteristics influence the process of knowledge activation in creativity work. The different viewpoint in observation process finds out the unexpected users’ needs. However, the personal viewpoint, which is formed through one’s various experiences, is hard to change suddenly. The design team of IDEO is composed of various experts in different fields. It means that each of the different viewpoints can facilitate appreciation on their creative design process. These previous researches and examples highlighted the importance of different personal viewpoints in the observing process.

## 2.2 ADT Model

According to the *Suto's* Alethic/Deontic/Temporal (ADT) model that was developed based on the relationship with an artifact, the designer, and users, there are 3 layers in the design model: 1) Main layer reflects the user's possible states and operations, 2) Top layer reflects the designer's intentions, and 3) Base layer reflects physical laws. It means that the user's behaviors are affected by physical laws and are restricted by designer's intention. We designers need to observe the relationship between cause and effect in design. In other words, designers need to observe the user's experience based on the relationship with physical laws and the user's behavior.

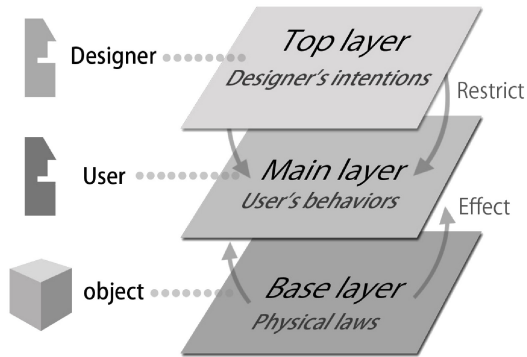


Fig. 1. ADT Model

## 2.3 Kansei and Culture on Design

*Mark* emphasized that we designers should more focus on user's feeling (=Kansei) than on user's opinion during the observation process. *Kansei* has a comprehensive meaning including feeling, emotion, and creativity etc.,). *Kansei* appears in different evaluations results in different cultures. To understand one's *Kansei*, designers need to understand the culture that had influenced the user's attitude and behavior. According to *Nagamatchi*, the *Kansei* included are the district's culture and history that should be implemented in the design. *Trevor* emphasized the reasons why emotion (*Kansei*) has a profound influence on the success of a design [9]: 1) Emotion is experience, 2) All design is emotional Design, 3) Emotion dominates decision making, 4) Emotion commands attention and affects memory, and 5) Emotion communicates personality, forms a relationship, and creates a meaning.

From the previous research, designers have to understand not only the relationship between physical laws of designed item and users' behavior but also users' *Kansei*, when they interpret and use the designed item. Moreover we have to understand the culture as a common value in design.

## 2.4 Visualizing and Sharing and TTS Method

According to *Suwa's* research, visualization as Meta-recognition is very important in perceiving an idea in the design process. Meta-recognition means recognizing through

the visualized one's cognition such as Idea sketch, note and photo. To borrow *Suwa's* expression, the visualizing of one's idea is not only an expression tool but also a cognition tool. *Ikekawa* addresses the objective visualization of design process. In addition, *Takano* and *Saitou* proposed a tool of conception support using the visualized languages of adjective, noun, and mimetic word in a group. Visualizing helps to share others with their opinions and ideas. In addition to visualizing, conversation (language exchange) is one way to share others with their opinions and ideas. Sharing with conversation does not need any tools for sharing work. However, the conversation is likely be influenced by time series and is hard to conduct as a simultaneous work. Moreover, unless all participants have a common language, it is difficult to understand and share immediately, even though each one has a good idea. In contrast, using the visualized information such as photo, sketch, and note are not affected by time series, is able to be conducted as a simultaneous work in the same time without a common language.

Based on the previous research about visualizing, our research team proposed the Turning Thinking Sheet (TTS) method. The TTS method (Fig. 2) is a way to share with the visualized each other's opinion, experience, and idea, based on the role of Meta-recognition. The TTS method was composed of the following five steps to create new design: 1) Each participant visualizes a user's needs using several keywords from the observed user's experience on the first TTS method sheet (Step 1), 2) Each participant expresses one's similar experience about the keywords on the second TTS method sheet (Step 2), 3) Each participant expresses one's idea or proposal for fulfilling the user's needs on the third TTS method sheet (Step 3), 4) Each participant expresses a similar example with each of the created idea or proposal on the fourth TTS method sheet (Step 4), and 5) Each participant expresses one's feeling if he/she uses the created idea on the fifth TTS method sheet (Step 5). Every participant has to express one's opinion, experience, and idea on each sheet and return each sheet to all participants in his/her own team.

The figure displays five overlapping sheets of the TTS (Turning Thinking Sheet) method, labeled Method 1 through Method 5. Each sheet contains a specific instruction for the participant to express their opinion or idea. The sheets are arranged in a stack, with Method 1 at the bottom and Method 5 at the top. The largest sheet, Method 1, has a large central area with the text "Each participant should express one's opinion & idea in here." Below the instructions, there are fields for "実施日 (Date):" and "実施者 (Conductor):".

**Fig. 2.** TTS method sheets

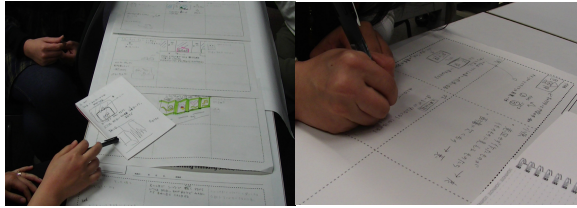


Fig. 3. Example of using the TTS method sheets

2.5 Summary

From the review of previous research, the interdependence of cause and effect in design has to be observed in the design process. The interdependence of cause and effect is related to the designed subject, users, users' *Kansei*, and circumstances including culture. Consequently, in this research, we extend the base layer of the ADT model to the following three factors: 1) Physical factor: Artifact (Mental model, Affordance) , 2) *Kansei* factor: User's feeling (Emotion, Feeling), 3) Cultural factor: Circumstances surrounding human and artifact (Custom, Culture). It means we have to observe the relationships among users behavior, designers' intention, and the Physical *Kansei*, and Cultural factor as the base layer. Fig 6 shows the Extended ADT model.

In this research, the following hypothesis is drawn based on the review of the previous literature: "Observing physical factor, *Kansei* factor, and culture factor with different viewpoints, and visualizing and sharing the observation results not only helps to understand a user's needs including a potential need but also helps to apply the observation results to a design process."

The purpose of this research is to clarify the hypothesis, based on the results of some international design workshops as a case study. Therefore, in this research, we discuss 1) the role of observation with different viewpoints, 2) the validity of the following three factors: 'Physical factor,' 'Emotion factor,' and 'Culture factor' as the subjects of observation and 3) the reconfirming TTS method to visualize and share the observation results.

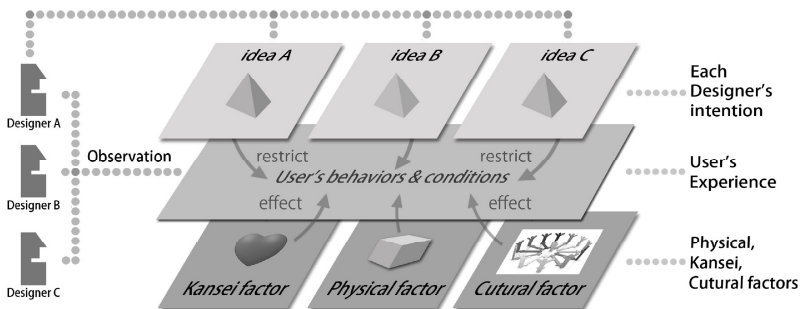


Fig. 4. Extended ADT model

### 3 Case Studies

#### 3.1 Case Study 1: Portable Chair for Tourist (Theme: Asianism)

In Beijing, China, our research team that was comprised of students from Japan, Korea and China conducted observation as a part of the international design workshop process. During that time, each member observed the three factors: *Kansei*, Physical, and Cultural factors. As a result, they obtained the following four *Kansei* factors: 1) A tourist wants to enjoy their sightseeing, although it is bad weather (too hot), 2) A tourist wants to seat when he/she is tired (most tourists walk a lot to enjoy their sightseeing), 3) To seat on the ground without a chair is shame, and 4) Tourist does not want a heavy item for sightseeing (most tourists bring many items like a camera, a guidebook, some drink, etc.). In addition, they obtained the following five Physical factors: 1) A chair is too heavy to bring to the sightseeing point, 2) Ground is dirty to seat on without chair, 3) A flyer sheet has a role to protect dirty (=Affordance) when a tourist uses it for seating, 4) A raised spot of garden has a role to seat (=Affordance), and 5) There are only few trash cans in the historical place. Finally, they obtained the following four Cultural factors: 1) The Chinese like to talk with others, 2) Many Chinese seat on the ground, even though there is a historical place like the *Tiananmen*, 3) Many Chinese do not clean up the flysheet used for seating, 3) Summer of Beijing is too hot, and 4) There are too many chances to get a flysheet in front of the historical place.

Then, they shared their opinion and thinking with each other using the TTS method, and created a new design. Figure 5 shows the design processes based on the extended ADT model. The designed portable chair for tourists is small, light, and easy to carry, but it is strong due to the honeycomb structure, even though it is made from paper (Fig.6).

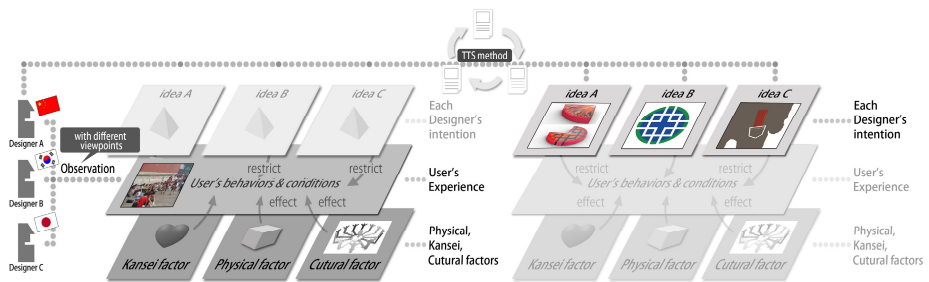


Fig. 5. Design process based on the extended ADT model

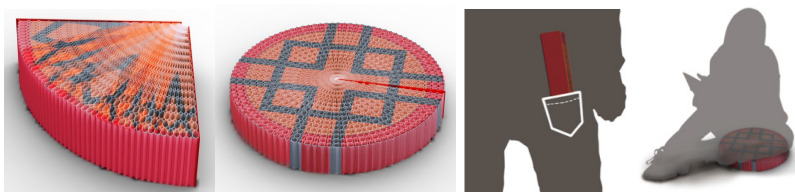


Fig. 6. Portable chair for tourist

### 3.2 Case Study 2: Dining Items for Party in Korea (Theme: Eating)

In Seoul, South Korea, our research team that was comprised of students from Japan, Korea and China, conducted observation as a part of the international design workshop process. During that time, each member observed the three factors: *Kansei*, Physical, and Cultural factors. As a result, they obtained the following three *Kansei* factors: 1) A tourist tries to eat different foods on one’s journey, 2) Everyone does not want to spoil their pleasure when they drink with others, and 3) Party with friends or family is always pleasant. They obtained the following three Physical factors: 1) The volumes of glasses for *Soju* are almost the same as those in Korea, 2) Many plates of side dishes need a lot of space on a table, 3) The chopstick set across plate of side dish are easy to fall into the table. They also obtained the following seven Cultural factors: 1) The Koreans share the food with others, 2) There are many side dishes in Korean food, 3) Koreans like to drink chugalug *Soju* using a small glass 4) It is difficult for Koreans to turn down alcohol drinks when he/she drinks with seniority, 5) The Koreans do not show their drinking figure to seniority, 6) The Koreans use chopsticks in their eating, and 7) Sticking chopsticks into the food is considered rude behavior in Korea.

Then, they shared their opinion and thinking with each other using the TTS method, and created a new design. Figure 7 shows the design processes based on the extended ADT model, and figure 8 shows the designed dining items for party in Korea. When you drink *Soju* with seniority, you can control the volume of glass of *Soju*. It means you do not feel any stress of overdrinking without spoiling your pleasure. The chopsticks and bowl are designed for sharing in party of Korea. The top of chopsticks is made with magnet. So if you want to take some side dishes, you connect the front part and take some side dishes to one’s plate, and return the front part to original position.

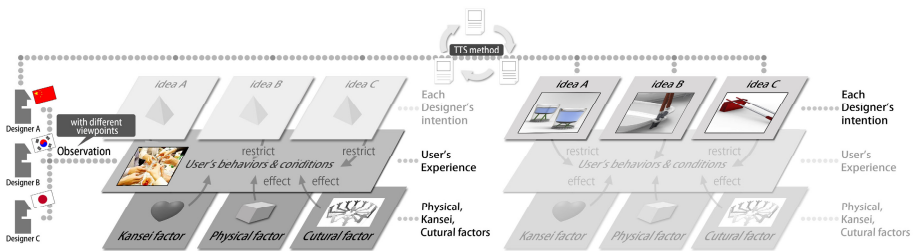


Fig. 7. Design process based on the extended ADT model



Fig. 8. Dining items for party in Korea

## 4 Conclusion

In this paper, we dealt with the way to observe, share and apply the results to design process. Therefore, we proposed TTS method and the extended ADT model based on 'Physical factor', 'Emotion factor' and 'Culture factor'. And we conducted both international design workshops using these methods. As the results, the method to observe 'Physical factor', 'Emotion factor' and 'Culture factor' helps to understand a user's situation and needs. And the observing with the three factors is effective to find out user's needs including a potential needs. This type of user's needs is difficult to be found out with the approach based on the questionnaire survey. And Moreover, as visualizing and sharing the observation results with TTS method become to easy to understand each other's thinking and opinion, and easy to apply the observation results to design process.

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