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Eliciting Audience's Experience to Improve Interactive Art Installation

Hanif Baharin, Ann Morrison

Designing with the users in mind is one of the widely accepted design practices in the Interaction Design field. On the other hand, it can be said that audience's experience is the heart of an interactive art. Since Interaction Design has shown that user's involvement in the design process can be beneficial, it is speculated that involving the audiences in the creative process of developing an interactive art piece can make the artist improve the art in general and the audience's experience in particular. In this paper, the experience of eliciting the experience of the audiences of an interactive art installation using techniques adopted from Interaction Design such as prototyping, observation and contextual interview is described. This paper also presents the result from the contextual interview and the improvement made to the installation.

1. Introduction

This paper describes the experience of applying user-centered design techniques borrowed from Interaction Design field in developing an interactive art installation. In an installation, the artist wants to convey her or his artistic meaning to the participants but at the same time wants to evoke a variety of interpretations and not just a monotonous response. Thus, participants and their experiences are an integral part of installations. One of the key characteristics of Interaction Design process is the need to focus on users (Preece, Sharp & Rogers c2002.). User involvement from an early phase of design process is beneficial because it can increase user acceptance of a product. By involving the users early in the process, many problems which will usually be difficult to solve or will cost a lot of time and money can be avoided. Other than that, user involvement can also lead to higher user satisfaction.

Based on the fact that Interaction Design has successfully shown the benefits of user participation, a prototype of an installation titled 'Alice's Tea Party' has been developed to elicit information from the participants using Interaction Design approach of observation and contextual interview. A study done by Höök, Sengers, & Andersson, (2003) has shown that HCI evaluation of interactive art can be useful to the artist to improve the artwork; hence enhancing the participants' experience. Therefore, it was speculated that the findings from the observation and contextual interview can be used to improve the audience's experience, to find fault in the technical aspects of the installation and help the artist

to evaluate the self-expressions that are to be conveyed by the installation.

1.1 Study Aims

Prototyping, observation of audiences and contextual interview were done to find out the following:

- Does the installation manage to convey its artistic intention?
- Does the installation encourage the participants to experiment?
- Does the installation manage to evoke any emotion?
- Does the installation manage to evoke a variety of responses and interpretations?
- Does the installation have any faulty or usability problem?

2. Alice's Tea Party

'Alice's Tea Party' explores the contradictory views people hold about machines. These contradictory views can be best shown by media equation (Reeves & Nass 1996.) According to Reeves & Nass, (1996) people treat computers like they treat people but when asked about it, denied the act completely. The purpose of 'Alice's Tea Party' is to give cultural provocation to our view of machines. We think of machines, especially computers, as intelligent and to serve some purpose. Unconsciously we treat a computer like a human being. The installation tries to make this view explicit by reminding the participant of the absurdity of treating a machine as if it was a human being.

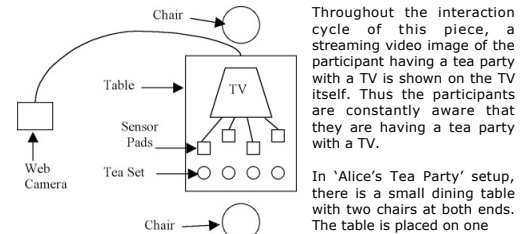


Figure 1 - 'Alice's Tea Party' Floor Plan

side of the space and a video camera is placed on the opposite side of the space. On one end of the table, there is a TV. In front of the TV, on the table surface, there are four sensor pads with images of a teapot, a

cup on a saucer, a milk jug and a sugar bowl on each pad. These pads are connected to a computer underneath the table. On the other end of the table, there are real items: a teapot, a cup on a saucer, a milk jug and a sugar bowl. Floor plan of 'Alice's Tea Party' is shown in Figure 1.

The interaction scenario of the installation is as follows:

- Participant enters the space and sees text on the TV, which asks him or her to have a sit.
- Once seated, the participant can see a streaming video image of the participant, the TV, the tea set on the table and the chairs on the upper left corner of the TV screen. The streaming video image is displayed throughout the interaction.
- The TV will then display text asking the participant to pass the teapot.
- When the participant puts the teapot on either one of the pads, TV will show an image of teapot as a response.
- Then, the TV will then prompt the user using text to pass all other items, the cup first, then the milk jug and lastly the sugar bowl and the TV will respond accordingly.
- When all items are put on pads the TV thanks the participant and asks him/her to take all items off the pad before he/she leaves.
- If the participant leaves his/her chair without taking all the items off the pad, the TV will give out a warning sound and a message asking the participant to obey the instruction.
- The machine cannot distinguish which items are put on the pads; it just gives a response according to the question asked when it detects pressure on the pad.

3. Study Methodology

3.1 Interaction Design Methods

In interaction design, observation of users will help the designers to focus on users and their needs. Observing users using software in an office, for example, may yield information that cannot be obtained from testing the software in the lab. Thus the information of product usage in its intended context is important for the designer. Other than observation, there are other methods used to help the designer elicit information about product usage. One of the methods is contextual interview.

According to Preece, Sharp & Rogers (2002), contextual interview, is a combination of observation, discussion, and reconstruction of past events based on four principles - the importance of making observations in the workplace (context), the importance of collaboration between developer and user to understand the work (partnership), collaborative

interpretation must take place between developer and user (interpretation) and the interview must remain focused on the subject (focus).

Prototyping is another method used in interaction design to elicit information from users. One example of prototype usage in Interaction Design is the technology probe - a high-end prototype that is used in its real intended environment over an extended period of time. Technology probe had been used to successfully collect data about user experience in the real world setting and as a tool to test the engineering aspect of a product as shown by the study done by Hutchinson et al (2000). For that reason, prototypes of 'Alice's Tea Party' were developed and used in combination with observation and contextual interview to elicit information about audience's experience.

Findings from observation and contextual interview will then be used in the next iteration of the installation. The first prototype was tested in a usability lab. The usability lab was chosen as a place to test the prototype because it enables the audience to be left completely alone to interact with the installation and audience interaction can be videoed properly. The major aim of the study in the lab is to find usability and technological issues with the installation. In the second iteration of the prototype, a more elaborate version of the first prototype was set up in a public space to closely resemble the finished installation as intended by the artist (Figure 2). While this set up enables the study of the installation in its real intended environment, the audiences can not be completely left alone while they interact.

3.2 Participants

10 people participated in the usability lab and 11 people participated in the outdoor public space test. Participants in the lab were university students and lecturers from various fields of studies who answered to an advertisement posted in mailing lists. In the outdoor settings, students who passed by the installation setup were either asked to participate or volunteer to participate out of curiosity.

3.3 Data Collection

Participants were given 10 minutes to interact with the installation. Participants were then interviewed while they were still sitting in front of the TV. There are two sets of interview questions, one set for participants who experimented with the installation and the other for



Figure 2 – Set up in the usability lab



Figure 3 – Set up in the public space

those who did not experiment and not find out that the machine is unintelligent. The participants who did not find out that the machine is unintelligent were shown that the machine is unintelligent and were asked why they would not want to experiment further with the installation.

In the lab, participants were observed and videoed from a one way window from another room. They were left completely alone with the installation. Meanwhile in the public space, participants were observed and videoed from behind a lace curtain.

4. Findings

Does the installation evoke any emotion?

Two participants said the installation didn't invoke any emotion. 19 participants said that it did, and the emotions stated varied. However, most participants described the installation as clam, soothing and comforting. However there were participants who felt annoyed, awkward and curious

However, most participants became frustrated at the end of the interaction because they did not know what to do or took such a long time to get the idea that the machine was asking them to leave.

Does the installation encourage the participants to experiment?

10 people found out that the machine is unintelligent. Out of the 10, seven were from the experiment done in the usability lab and three were from the experiment in the public space. 11 people did not find out that the machine is unintelligent and seven of them were from the experiment done in the public space. When the experiment was done in the usability lab, the installation was not as elaborate as the one in the public space. The participants were left completely alone with the installation. The large differences between the number of participants who did find out the machine is unintelligent in the two places cannot be attributed to the fact that the participants thought the installation as a

tool of an experiment in the lab because only two out of 10 participants in the lab thought that the installation was just an experiment.

Four participants who did not experiment came from an Interaction Design program and have programming knowledge. One in particular has worked and currently is working with the technology behind the sensor pad.

When asked why the participants did not experiment with the machine, the reasons given can be categorized as follows:

- Obeying orders – participants did not experiment because they just follow the instructions given by the machine. A participant said "I just follow instructions"
- Confused – participants were confused with the instruction for them to leave. The machine said, "Thank You...please remove all the items from the pads before you leave." The participants could not figure out that they have to stand up to start the interaction again. When the machine did not detect a response it asked, "Why are you not responding?" An example of the reason given for not experimenting was "Why did it ask me so many times, why am I not responding? I'm waiting for it to ask me to do something."
- Goal-oriented – participants felt that they had completed the task or couldn't find the reason to do things that did not achieve any goal. Examples are "I didn't see the point of repeating the task" and "I don't think I would (experiment), because I thought I had completed the tasks."
- Being polite – the reason in this category is the most interesting. The participants said that they just want to be polite. One said that if the machine is a real person, it is inappropriate to give the wrong item when asked. Another participant did not experiment because the interaction reminded her of having a tea party with grandma where one has to be polite. One said, "I feel a bit rude to cheat it."

The participants who found out that machine is unintelligent were asked how did they find it out. Responses from the participants can be summarized as follows:

- Curiosity and the desire to test it out - A participant said, "I just want to test it because I don't think it could be that intelligent!"
- Having background knowledge of the technology behind the pad or programming – "As soon as I realize the repetition I know that this program is a simple loop" said one participant. Another said, "I know the pad just senses weight."
- Not seeing the images of the pad in the first place – some participants did not notice the images on the pads. When they

found out that they made a mistake but the machine still gave a response they realized that the machine is unintelligent.

What do you think the video image means?

Participants did not really give any attention or took notice of the streaming video image on the upper-left corner of the TV screen. However when asked about it, 10 participants gave answers which are related to the artistic intention of the video image. The artistic intention of the video image is to constantly remind the participants that they are interacting with a machine but treating it like a human being. It was meant to give them a new perspective on this unconscious behavior. Responses which are related to the artistic intention are as follows:

- It is for simulating another person, that's why the video included the empty seat at the other end of the table, just like having tea with someone.
- I suppose it is a way of getting the participants to view themselves as if they were interacting with someone else.
- It made me feel like I was not interacting with a computer.
- It draws me more into the place and I don't know why I'm having a tea party with myself.
- To make it more like a real person.
- To see what I was doing from a different perspective.

Five participants who did not give answers which are related to the artistic intention of the video thought that the video is for surveillance, security or recording purposes. Three participants out of the five were from the experiment in the usability lab. All other participants either thought that it was not part of the installation, did not notice it at all or said that they did not know what it means.

Does the installation manage to evoke a variety of response and interpretation?

As seen in the previous subtopics, the installation had managed to evoke a variety of responses from the participants. When asked what they think this 'interactive art' was all about, three participants from the usability lab said that it was just an experiment. Six participants gave varied answers which are not related to the artistic intention of the installation at all.

12 people gave answers which are closely related to the artistic intention of the piece, especially the four participants who explicitly stated that the installation is about:

- Making the computer more like a real person.
- Having a tea party with someone.

- An imaginary friend.
- Relationship, having tea with a beautiful woman.

Eight participants started thinking about the relationship people have with technology or about technology itself. Among the interpretations obtained from the eight participants were:

- Can people act naturally with a machine?
- Unsure if it is necessarily about anything, but it may be about making people feel comfortable interacting with technology
- It is about understanding how humans react to different simulation given by the machine.
- Creating a contrast between nostalgic feelings and the technology, bringing old idea and making it modern to show how technology has become so prevalent in our life.

When the participants were asked what the interaction reminded them of, they gave a variety of answers which reflect their personal experiences. Thus, the experiences the installation created for the participants were not monotonous. Among others, the interaction with the installation reminded the participants about:

- A simple game.
- Virginia Woolf
- Playing with imaginary friends
- Sophisticated ladies
- European, early 1900
- A test
- Having a tea party
- Tea party with grandmas
-

Does the installation have any faulty or usability problem?

From the experiment in the usability lab it was found that the sensor pad on the seat was too small. Sometimes the participants sat on the edge of the chair and did not even touch the pad. In the experiment in the outdoor public space a bigger sensor pad was made for the seat.

It was also noted that several participants did not notice the images on the pads on the table. This is because they are small, and the images have the same floral pattern as the tablecloth. But by increasing the chances for the participants to make mistakes will also increase the chances for them to find out that the machine is unintelligent. Thus it was decided not to alter the sensor pads on the table.

All the participants did not really notice the streaming video on the upper left corner of the TV screen because they are concentrating on the instruction text in the middle of the screen. Therefore, it is suggested

that in the next iteration of the installation, the streaming video image could be placed in the middle of the screen with the instruction text placed underneath the streaming video.

5. Lesson Learned

Prototyping and eliciting audience's feedback have proven to be beneficial in improving the artwork and the process of making interactive art. Using techniques borrowed from Interaction Design, the artist is assured that the installation had managed to convey its artistic message to the participants. This is proven when the participants started to think about human and computer relationship and relate to the machine as another human being and some participants explicitly stated that they did not want to be rude to a machine. The streaming video image can also be said to have managed to convey its meaning when 10 out of 21 people gave an interpretation that is related to the video's intended meaning. In a piece of work that is open to interpretations, the quantity of people who get the intended meaning is not as important as long as there are people who understand it. This is because, although the work wants to convey a certain meaning, at the same time it also does not want to generate responses which are monotonous.

The usage of prototype had proven to be beneficial especially in finding out whether the installation encourages the audiences to experiment. The finding shows that participants were confused of what to do at the end of the interaction cycle, because the instruction for them to leave was not clear. The machine said, "Thank you...Please remove all items before you leave." The participants removed the items and waited for the next instruction. But when the machine sensed that the participants did not stand up from the seat it asked, "Why are you not responding?" It took some time for the participants to understand that they had to stand up if they wanted to start all over again. To overcome this problem, the instruction at the end of the interaction was changed during the second iteration of the prototype. In the second experiment, after the machine senses that the participant has removed all the items from the pads, it says, "Goodbye...see you again." It was found that the audiences in the second experiment quickly understood that the machine was asking them to leave. However, this encouraged them to stop exploring the installation; hence the small number of participants in the outdoor setting who found out the machine is unintelligent. In the next iteration cycle, it was proposed that the interaction should be kept longer by asking the audience to do more activity such as removing the tea set items one by one from the pads, thus increasing the chances of finding out that the machine is unintelligent.

The contextual interviews done had shown that people's tendency to experiment with the installation is regardless of their background, but personality and personal memories may play a part when it comes to

exploring and playing around with the installation. The interviews had shown that tendency for people to obey or not to obey instructions from a machine does not depend on their knowledge about the technology that makes the machine works. It depends more on their personality and how they react in a certain environment. Some participants were goal oriented and stopped interacting once they felt that the goal was achieved, or just could not find the point of doing something that did not achieve any goal. Some participants were driven by their curiosity. Others were constrained by the need to act politely although they knew that they were in a simulated environment.

Finally, Interaction Design methods used to study the installation have also proven to be useful in improving the technical aspects of the installation. The study detected the usability flaw in the installation, which is, the size of the pad on the seat is too small. Other than that, the study has revealed that the video could be placed in the middle of the screen so that the participants give more attention to it.

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