A Study of Cultural Tolerance Reference Frame for Culture-Based Design

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Abstract Smart Dining Table is an ongoing project in our Interaction Design Lab. It is a table top display designed to facilitate dining process. Smart Dining Table uses touchable interface to interact with users, providing a new, interesting and efficient experience in dining process.
In GuangZhou, the south city of China, Yam Cha is a traditional and local way of entertainment in which normally elders gather together with friends or relatives to have tea and snack, and most importantly, to chat. Yam Cha has a long history in China, and Guangzhou has developed its own unique "Yam Cha" culture.
In this paper, we discuss about previous research we did on Yam Cha in GuangZhou, and the approach we propose to manage and analyze issues related to dining table to help designing specific version of Smart Dining Table which can fit right into the Yam Cha process and cultural environment.

Keyword: Cultural Tolerance, Culture-Based Design, Smart Dining Table, Yam Cha

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1. Introduction

How can designers apply an relative new technology to a relative old and cultural environment? This question is crucial to design, because certain culture may misunderstand or reject some "inconsiderate" designs. When the environment becomes too complicated, it is very easy but useless to design for only one cultural issue at a time. Because the design itself may focus on usability and beauty, thus forget the acceptance of local users. The designers may base on their own assumption and change some part of the product or process which happen to be the old users' habit, and the cultural feeling is then gone. It seems that the beginners tend to make this kind of mistakes, but experts won't because they are well experienced. In this paper, we try to find a certain method to manage information and help making design decisions, we discuss our approach to solve this problem, namely **Cultural Tolerance Reference Frame (CTRF)** for Culture-Based Design.

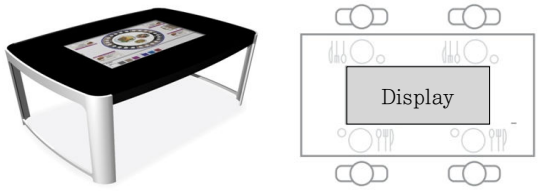

Figure 1 : Smart Dining Table (Prototype) [3]

Smart Dining Table is a prototype of Interactive Display Set (IDS) project funded by Seoul City Government (from 2006 to 2010). The purpose of this IDS project is to develop the next generation of interactive displays which would facilitate not only working process for individual or company, but also public service. Smart Dining Table focuses on how to use this technology to facilitate Dining Process, as shown in

Figure 1. Smart Dining Table is a Table Top Display which has a touchable and interactive interface to facilitate the dining process. The display is directly built into the top of the dining table, providing touchable input as well as graphic and audio output. Smart Dining Table is very powerful at providing information and interacting with users, but at the cost of sacrificing certain space of the table top.

Figure 2 : Yam Cha in GuangZhou

Yam Cha is the traditional saying of drinking tea in GuangZhou (as shown in **Figure 2**), but what Yam Cha means is not drinking tea at home, it happens in the tea house with several friends and relatives drinking, eating and chatting at the same time. There are many snacks in Yam Cha and chatting becomes the main purpose. It is so popular in GuangZhou that tea houses normally open at 5 am. and close at midnight.

Because Yam Cha has a history of more than hundreds of years and the main users are elders, there are so many traditional behaviors, artifacts and contents that have to be taken into consideration when we try to design the new version of Smart Dining Table for Yam Cha. And this is also where our idea came from and why we try to find the method to help finding the right things to design and redesign. In the following parts, we discuss about the previous research we did on Yam Cha, and our approach (cultural tolerance reference frame) to help managing issues around dining table and making design decisions.

2. Previous Researches about Yam Cha

Previous Researches about Yam Cha were done by GAFA(Graduate Academy of Fine Art) in GuangZhou and our Interaction Design Lab together. We researched on the artifacts, behaviors and process of Yam Cha, found many problems and proposed some solutions for them.

2.1 Research on Yam Cha

Yam Cha is one of the famous representations of GuangZhou culture. The previous researches we did on Yam Cha cover many aspects of it. We focused on user's experience from human's five senses point of view (Sight, Touch, Taste, Smell and Hear), as shown in **Figure 3**.

Figure 3 : Five senses in Yam Cha

Based on previous research about Yam Cha, we categorize the Yam Cha process into three parts: 1. Entering; 2. Yam Cha; 3. Payment and leaving. Each part has detailed processes and interactions between customer and tea house, as shown in **Figure 4**.

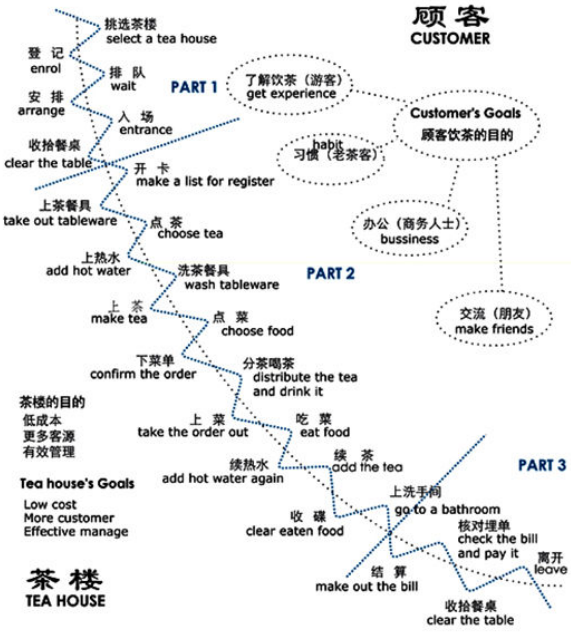

Figure 4 : Process Analysis of Yam Cha

During these previous researches, we found some usability or other kinds of problems in Yam Cha, but local users are normally not aware of them and even stick to some problems we think are not that efficient.

2.2 Problems found and Solutions proposed

Here are some examples of the problems we found and solutions we proposed in Yam Cha. The solutions are not ideal and that's what lead us to think of a new method to manage these problems and find out what can be and can not be changed.

Problem 1

Figure 5-1 : Choosing Snacks in Yam Cha

Figure 5-1 shows the traditional way of choosing snacks in Yam Cha. Because there are so many different kinds of snacks in Yam Cha but the food containers are very similar, it's difficult to recognize the right food which the users want to have. The solution proposed for this problem is shown in **Figure 5-2**.

Figure 5-2 : Solution Proposed for Figure 5-1

The solution uses moveable board with information on it to tell users what snack the container on it contains. But this design requires too much physical movement and space, which is not proper especially for elders.

Problem 2

Figure 6-1 : Asking waiter to add tea

Figure 6-1 shows the traditional way of asking waiter to add tea. The users put the lid like this and the waiter will come and take away the teapot to add tea. But this little signal is difficult to see expecially when there are many users. The solution proposed for this problem is shown in **Figure 6-2**.

Figure 6-2 : Solution Proposed for Figure 6-1

This solution uses different buttons around the table to send different signals, the digital watch on the waiter's hand will then tell the waiter what to do. But the traditional way actually has long history and even a legend about it, the local people has got so used to it and even consider this as a part of their culture.

Problem 3

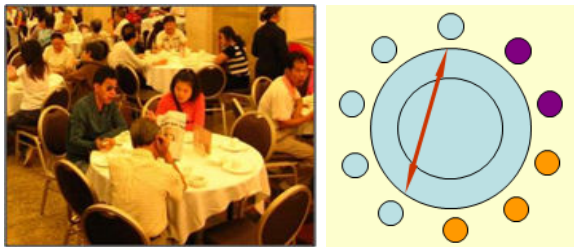

Figure 7-1 : Local behavior of sharing table

Figure 7-1 shows the local behavior of sharing table. Because of the population, sometimes strangers have to sit at the same table, thus leads to many problems. The solution proposed for these problems is shown in **Figure 7-2**.

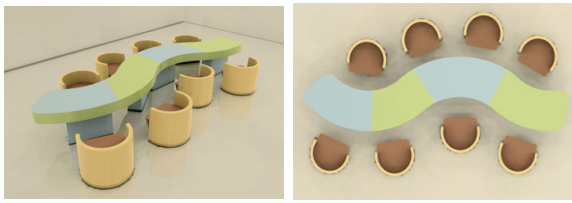

Figure 7-2 : Redesign of dining table

This solution changed the shape of the table in order to solve the problems in sharing table. Although when we use this table, people can share the table better than previous one, but the traditional feeling is totally gone. Because the shape of round table is also a part of the

Yam Cha culture and normally used in China.

There are many other problems found and solutions proposed in Yam Cha process. With these problems and solutions, we found the problem that people tend to solve one problem while causing another one. Although this is common in design process, but the cultural feeling here is something we don't want to change. Thus, we try to find the common and important issues related to Cultural Tolerance.

3. Cultural Tolerance

The previous examples and many other researches we did on Yam Cha remind us the importance of taking Cultural Tolerance under consideration. The phrase "Cultural Tolerance" here means that if the culture can accept certain design changes or not. For example, in the previous part, the solutions we proposed actually changed something that the culture can not accept. In order to design the right version of Smart Dining Table, we need to know what changes can be accepted by culture, or in other words, what can be and cannot be changed. Although this Tolerance may be different depending on individuals, what we are trying to find is some common aspect which affect most individuals.

3.1 Issues related to Dining Table

Inspired by problems in previous research, we first abstract all the artifacts and behaviors into the word "Issue". In the case of Dining Table, The Phrase "Issues" can be anything that related to dining table, it can be **Attributes of Table**: Table Shape (circle for 6, circle for 10, square for 4), Location and Layout; **Artifacts around Table**: Chair, Spoon, Chopstick, Bamboo Steamer, Cup, Bowl, Tea, Food; **Service around Table**: Order, Add tea, Payment, Serve Foods; and **Behavior around Table**: Having dinner, Asking for more tea, Chatting, Sharing Table, Stepping on chair. These four categories we use here are just used as examples of what the word "Issues" here can be, there may be other categories of issues related to dining table. These issues related to the dining table could be suggested by certain survey or brain storming in a group of researchers to think of as many instances as possible.

The reason we describe all these things related to dining table just by using the word "Issue" is that we only focus on the acceptability of local users, not structure or categories of them. In this case, we try to focus on each of these issues and ignore the categorization. The key point here is how to evaluate these issues to help making design decisions to help Smart Table fit into Yam Cha process. Evaluation here is to evaluate that if this issue is something which we should or should not change in order to let local users accept it.

3.2 Three Dimensions related to Cultural Tolerance

Through all the issues discussed in the previous researches and designs about Yam Cha, we summarized three Dimensions related to Cultural Tolerance which we believe is very important. These three dimensions are attributes of the issues we mentioned above, namely **Informatization**, **Localization** and **Long Existence**. The definition of these three dimensions is discussed as follows:

- **Informatization**: the proportion of information contained in a certain issue. Which means that the issue here has a information side and a physical side, but different issue may contain more information than physical things. For example, the behavior of asking waiter to add tea is a issue which has about half information part and half physical part. Because the physical action itself contains certain information, by seeing this, the waiter can be aware of the need of adding water. But the ordering menu mostly contains information, with only very few physical requirement. Note that affordence of a product is not the information mentioned here. The information here should be something other than physical limitation or affordence.

- **Localization**: the distribution based on area, which means if a certain issue is very localized or not. For example, although GuangZhou is not the only place uses round table in China, but China is one of the very few countries use round table and China developed its own style of the detailed shape of round table. Thus while changing the shape so obviously, the cultural feeling is gone.

- **Long Existence**: the length of existence of certain issue by time, in other words, how long is the history of a certain issue. For example, the behavior of asking waiters to add tea has a long history of more than hundreds of years and even a legend about it. Thus when

we digitalize it, the cultural feeling is also gone.

These three dimensions of issues here are individual independent, so we can know them without being affected by peoples personal experience. But at the same time, these three dimensions are important to decide if a certain culture can tolerate a certain changes or not.

4. Cultural Tolerance Reference Frame (CTRF)

4.1 Definition of CTRF

First we introduce the famous cultural dimensions proposed by Hofstede, namely **Power distance**, **Individualism**, **Masculinity**, **Uncertainty Avoidance** and another dimension added later, which is **Long-term Orientation**. These cultural dimensions are used to describe the features about a certain culture. The visualized frame is like a square, as shown in **Figure 8**. (in this figure, there isn't the fifth dimension)

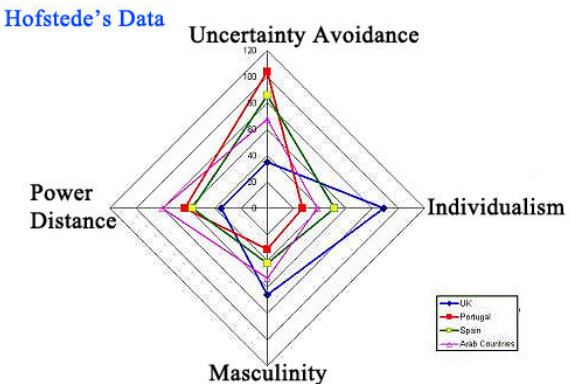

Figure 8 : Hofstede's Cultural Dimensions [4]

They use questionaries to give a certain culture scores in each dimension and then analyze them. This Cultural Dimensions is very useful at explaining the behavior of certain culture and can be used as a guideline for internationalized companies.

Inspired by Hofstede's Cultural Dimensions, we propose our Cultural Tolerance Reference Frame, as shown in **Figure 9**.

The difference between our CTRF and Hofstede's Cultural Dimensions is that the Cultural Dimensions is used to describe the culture itself, while our CTRF is used to help describing the tolerance of culture about certain changes, not the culture itself.

The CTRF is used for issues mentioned above. Each issue related to dining table (actually every issue in Yam Cha process) will have its value and corresponding figure

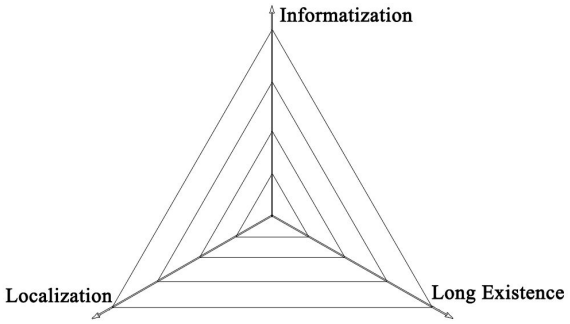

Figure 9 : Cultural Tolerance Reference Frame

in CTRF. The further from the center, the higher the score would be. These figures could then be used as reference of making design decisions to change this specific issue or not. Certain guidelines are needed for each of the three dimensions, which are discussed as follows:

- **Informatization**: the Culture-Based Design should try to maintain the proportion of information in a certain issue, unless the advantage of the design is revolutionary which means people would tolerate the disadvantage because of the advantage. Otherwise it's not good to change the Proportion of Information in this very issue.

- **Localization**: the Culture-Based Design should not change issues which have a relatively high score in Localization dimension. Of course the standard of Localization (scores) would be different depending on specific research topic, the key point of this dimension is to evaluate if the local people consider some issue only exists in their territory.

- **Long Existence**: the Culture-Based Design should maintain issues which have a relative long history. This means people have already got so used to the old design and it became their habit. They would even feel proud of that issue by considering it as their culture.

These guidelines described here should NOT be used as golden lines, they are just used as reference and should be viewed as a whole. The design decisions should still be made by designers according to various context.

4.2 Examples of using CTRF

Now we apply CTRF to the problems and solutions

discussed in Chapter 2 to show how this reference frame can help.

First we evaluate every issue (including the round shape of dining table) and give them certain score in all three dimensions (The scores here are given by rough data and assumptions, the purpose here is just to show how this reference frame can help). The corresponding figures are shown in **Figure 10**.

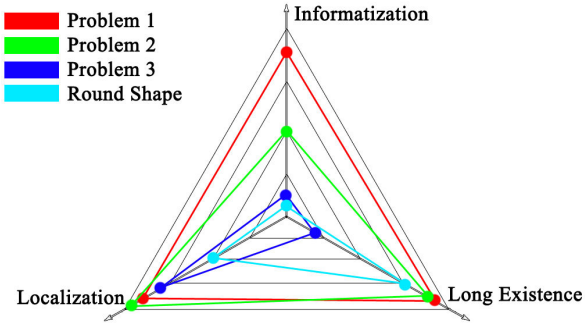

Figure 10 : Examples in CTRF

Problem 1 of Choosing Snacks is very localized and has existed for a relatively long time, as shown in **Figure 5-1**. The value of Informatization is relatively high because during this Choosing Snacks process, the users have menus and they would talk to waiters or waitress for further information, and then decide what to have. So there are actually many information communication in this process. In this case, although the solution proposed provides the information in details, it is not proper because it lowered down the value of Informatization by involving too much physical action in it. Thus make it difficult to use.

Problem 2 of asking waiters to add tea process is a traditional way to inform the waiter that the customers are out of tea, in which the customers put the lid of the teapot aside of its original position, as shown in **Figure 6-1**. When the waiters see this, they know they should add more tea for those customers. After adding the tea, waiters would put the lid back to its original position. this issue has a middle score in Informatization. However, it has a relative high score in Localization and Long Existence. There is actually a traditional story which cause this behavior, thus make it has very long time existence. So the solution proposed is not proper because it changed this too much that makes it become modern behavior.

Another example is "sharing table" -- **Problem 3**. The dining table is normally for 6 or 10 users, but customers often come together in a number of 3 or 4. because the seats are limited, some customers has to sit around the same table though they don't know each other, as shown in **Figure 7-1**. "sharing table" makes it possible to make use of the limited seats but also makes the customer difficult to communicate and lose the feeling of private space. In CTRF, "sharing table" has existed for a relatively short time because of the growth of population and has a relative high score in Localization. But it has a low score in Informatization. So this is the feature which should be improved or amended to provide better user experience. However, the solution proposed changed the shape of the table entirely. The shape of the table itself can also be an issue (as shown in **Figure 10**). This issue is localized in China and has a relative long history. The solution totally changed this thus make the cultural feeling disappear, which make this solution not proper.

All other issues related to dining table can be evaluated in the same way according to the guideline previously discussed. These three dimensions should be viewed as a whole, and whenever we have a new design idea, we can consider what we want to change in this CTRF and see if that is something should not be changed.

5. Conclusion and Future Work

In this paper we proposed an approach to help making design decisions for Smart Dining Table in traditional Yam Cha. This approach tries to help designers have enough information and structure about issues related to certain cultural environment, and help them find out the key issues suitable for designing new solutions.

In the future, specific standards should be proposed for deciding specific scores in every dimension. According to future research, one or two more dimension which is very important to Cultural Tolerance might be added to complete the frame.

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