A Study on Relation between Culture and Mobile Phone Interface design

with Emphasis on Recognition Performance according to Level of Abstraction in Icon Style

Kim, Ji-Hye
Dept. of Industrial Design, KAIST

Lee, Kun-Pyo
Dept. of Industrial Design, KAIST

• Key words: Menu representation, Icon Recognition, Cultural Effect, Cltural User Interface

1. Intoduction

Interest in the influence of culture on user interface design has been growing as the world market is globalized. In case of Mobile phone representing mobile products, Estimated 423million mobile phones were sold globally in the year 2002. Mobile phone development is becoming software-focused and user interface had totally different characteristics from desktop PC. Nokia reported that Eastern cultures display different consumer preferences from Western ones. Previous researches concerning cultural impact on interface have been mainly focused on web sites and publications and there is no research on relation between culture and mobile products,

Therefore, the objective of this study is to investigate the ways cultural differences might affect mobile phone performance of users with different cultural background, and to develop ways to design appropriate interfaces to accommodate cultural difference.

2.Difference between Easterners and Westerners

In the area of anthropology, many cultural variables have been suggested to distinguish and categorize different cultures based on various cultural models by anthropologists like Hofstede. Accordingto the cultural variables, Eastern cultures have authoritative and hierarchical systems and collective tendency. And they attach great importance to human relationship and try to avoid uncertainties. On the other hand, Western cultures have opposite tendency. Cognitive psychologists have also studied on difference in cognitive style between Easterners and Westerners. Westerners think in analytic, abstract, imaginative and linear sequence. On the other hand, thinking style of Easters is synthetic, concrete, relying on periphery and pararell.

3. Impact of Culture on mobile phone interface

Mobile phone interface can be defined as combination of 3 phases according to interaction process: Representation (Component, Template), Menu structure and Task flow. Interface issues which seem to be affected by cultural tendency were extracted from each phase (Figure 1). Especially in representatio phase, 4 hypotheses about icon style issues were proposed.

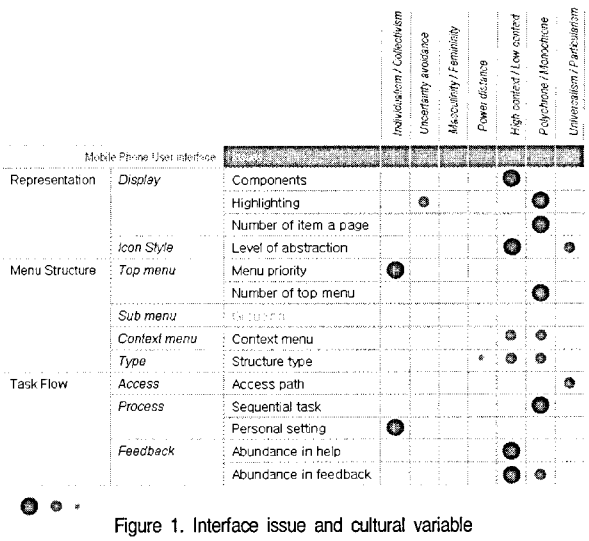

Figure 1. Interface issue and cultural variable

4. Hypothesis

Hypothesis 1. Familiar and Concrete icons would perform better than new and abstract icons.

Hypothesis 2. Subject groups would have some differences in recognizing icons and intended referents of function.

Hypothesis 3. Korean subjects would perform better with the concrete icons than American subjects.

Hypothesis 4. American subjects would perform better with the abstract icons than Korean subjects.

Hypothesis 5. Subject groups would have some differences in preferring icons.

5. Methodology

Menu icons which are used in current mobile phones in Korea and America were gathered and classified depending on their metaphor and how well they represent the icon referents. The icons were grouped into three types: abstract, semi-concrete and concrete. It was noticed that various kinds of icons are used to represent the same referent. Especially icons representing 5 referents (Call log, Message, Downloads, Voice Recording and Web) were ranged from abstract icons to concrete ones.

Therefore the 5 referents and 3 different icons in each referent were selected for test stimuli(Figure 2).

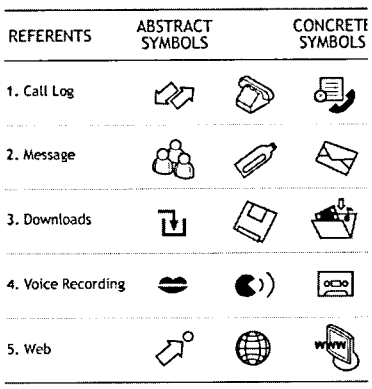

Figure 2. The 3 sets of mobile phone menu icons used in this study.

The test was in the form of web-based interactive questionnaires. 20 subjects (10 each from Korea and America) participated in the test. The questionnaires were provided in each country's native language and made up of 2 parts. Firstly in the icon recognition test (part one), the 5 referents and a set of 5 icons were shown. The subjects had to match each referent with one symbol which they though best represented the referent, In the icon preference test (part two), three icons (one for each set) together with the referent they presented were shown. The subjects had to choose one symbol they preferred most. The test parameters studied were the following:

a) Hits and Misses rate
b) Performance time
c) Prefernece

6. Results and Discussion

Part one. Icon Recognition Test (figure 3, 4)

The results indicated that for the Korean subjects, advantages were associated with concrete presentation in terms of recognition rate and performance time. A concrete representation provided a visualization aid in helping the Korean subjects, who were more field dependent compared to the American subjects, to perform the recognition task faster. On the other hand, the American subjects who had tendency to be more field-independent recognized the abstract icons better and faster. The American way of thinking tends to be more imaginative and less dependent on the periphery compared to the Korean.

Part two. Icon Preference Test

The subjects preferredthe semi-concrete icons most (54%), followed by the abstract and the concrete ones. Both groups showed almost the same preference and generally preferred icons they recognized better.

Figure 3. Icon recognition rate

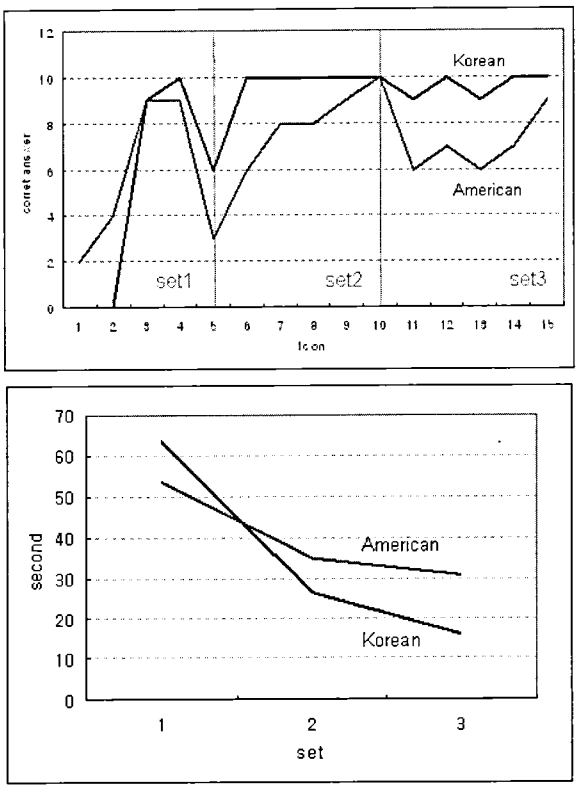

Figure 4. Performance time

Even though cultural tendency was slightly founded, the difference was not significant enough to prove the hypotheses. Because the tests were conducted with only 20 subjects and some icons might not be classified properly. Besides, balance between icons in a set might be inappropriate. This study could be an initial study for further researches clarifying relation between culture and mobile phone interface design in depth. In this study, only icon style which is one of GUI representation issue was treated. But other issues possibly related to cultural difference should be treated as well. Moreover, the other interface issues like menu structure and interaction flow are planned to be explored.

References

- Aaron Marcus, "Cross-Cultural User Interface Design", Michael J., and Salvendy, Gavriel, Eds., Proceedings, Vol. 2, HCII Conf., p. 502-505, 2001
- Hofstede, G., "Culture and Organization: Software of Mind", McGraw-Hill, New York, 1997
- Elsa M. del Galdo & Jacob Nielson, "International User Interface", Wiley Computer Publishing, 1996
- Richard E. Nisbett, "The Geography of Thought", The Free Press, 2003