

User-Interface Design and China:

A Great Leap Forward

If user-interface design seeks to encompass human-experience design, then computer-based communication and interaction designers need to keep Asian, specifically Chinese, users in mind. China, with approximately one-fifth of the world's population, an economy that is growing quickly, and a manufacturing system that exports a significant percentage of the goods imported into the world's countries, needs to be considered in revising concepts of user-interface and user-experience design.

Introduction

In recognition of the Fifth Asian-Pacific Computer-Human Interaction (APCHI 2002) conference, which took place in Beijing November 1–4, 2002, and influenced by my current location in China, I want to focus on some issues of user-interface design.

China, as too few Westerners know, is a vast, complex country with great challenges and enormous opportunities to affect many dimensions of world economy, culture, and communication. The country consists of five regions that differ greatly by economic level, spoken language, and culture [12]. The wealthiest areas are along the eastern coast, where Western businesses historically have established centers of commerce and communication. According to United Nations estimates, Shanghai will be the world's 13th largest city in 2015 with 13.2 million people, and the population of China will be approximately 1.5 billion people. China's exports have quintupled in the last 10

years, and the country's manufacturing facilities now produce a substantial portion of all goods imported into the United States. China now manufactures more than 50 percent of the cameras sold worldwide [8]. By 2004, China will surpass the United States in the number of Internet, cell phone, and landline subscribers (BDA Consultants, Gartner, Dataquest, IDC, MII).

In this essay I will not discuss the complex social, economic, and political issues of resolving Western notions of liberty, commerce, and individual freedom with their counterparts in China. Also, I will not address the issues of the relationships among the People's Republic of China, the Special Administrative Region of Hong Kong, and the Republic of China. Rather, I would like to focus on challenges and opportunities for the user-interface design profession to gain a better "understanding of human experience as China joins in developing computer-based devices and communication systems."



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Culture Dimensions and Cognitive Differences

One analyst of culture, Geert Hofstede, had to revise his study of IBM staff worldwide [6] to account for differences in Asian countries influenced by Confucian philosophy, the principles of which can be summarized as follows:

1. Stable society requires unequal relations.
2. The family is the prototype of all social organizations.
3. Virtuous behavior to others consists in not treating others as one would not like to be treated.
4. Virtue in relation to one's task in life consists of trying to acquire skills and education, working hard, being frugal, being patient, and persevering.

At the top of Hofstede's list of countries with a long-term (patient, persevering) time orientation is China, with a civilization that is more than 4,000 years old, waited a hundred years to retrieve the ownership of Hong Kong, and is willing to wait longer to see if the United States, which is only a few hundred years old, remains the center of commerce and world popular culture.

Hofstede commented that most business management books are Western-oriented and, although notably successful, are potentially biased and not entirely appropriate for all cultures, especially Eastern ones. A recent book, *Asian Wisdom for Effective Management* [13], attempts to adjust this cultural domination by informing the English reader of sources from Asian, especially Chinese, texts. The author comments, "The general principles of Western management theories and concepts are applicable in many societies except when cultural differences negate their relevance." User-interface design publications that attempt to account for Confucian contexts have finally begun to appear in the West, [for example, 7].

More generally, Nisbett *et al.* [11] have

compared Asian and Western thinking and concluded, as others have asserted or surmised, that each portion of humanity exhibits fundamental differences of philosophy or ways of knowing. One way to distinguish these philosophies is holistic versus analytical thinking. In their study, the researchers asked Japanese and U.S. observers to describe what they saw in an aquarium. The Asians described relationship among the fish, gravel, and plants. The North Americans described the individual characteristics of the fish. The difference in approach could be summarized as one of relationship-orientation versus object-orientation. They explain that Chinese and Greek thought tend to differ in their emphasis on the following paradigms:

- Continuity versus discreteness
- Field versus object
- Relationships and similarities versus categories and rules
- Dialectics versus foundational principles and logic
- Experience-based knowledge versus abstract analysis

These kinds of fundamental, systemic differences suggest that the user-interface design profession must carefully consider how Chinese approaches to time, space, logic, communication, and interaction might affect user-interface design principles and practice. These fundamental differences would appear to have significant implications for the design of metaphors, mental models, navigation, interaction, and appearance, indeed, user-experience design in general. A few suggestions of these implications follow.

Metaphors

At the annual IBM New Paradigms in Computing conference held in July 2002 at the Almaden, Calif., research center, Mr. Heiko Sacher, then of Point Forward (www.pointforward.com), demonstrated a prototype personal digital assistant on which

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Point Forward had worked with Sony-Ericsson. What made this project special is that the designers developed this prototype with a clear understanding of Hofstede's culture model and intended the product to take advantage of fundamental Chinese concepts for information, organization, and communication. Consequently, they rejected Western emphasis on applications (tools) and documents (plus folders) and instead emphasized the concepts of people, relationships, and wisdom (knowledge). Their focus group studies showed an acceptance value of more than 80 percent, implying that users found this new approach familiar, easy to understand, and comfortable.

Mental Models

In a study of Chinese and U.S. users, Choong and Salvendy [4] noted significant differences in mental models between the two user groups. By asking users to describe the contents of a house, they found that Chinese users tended to emphasize relationships, contexts, classification by interdependence within wholes, and reliance on subjective experience without sharp differences of self versus others or facts versus concepts. The U.S. users tended toward inferences, categories, classification by functions, analysis of components, and inference of common features. When the researchers gave Chinese users mental models favored by the U.S. users, they found that the Chinese users required longer performance times and were more likely to err. Similar results were found for U.S. users attempting to use Chinese paradigms.

Navigation

Although the proceedings of the APCHI 2002 conference contain many articles on navigation and browsing strategies suitable for the Web and for handheld mobile devices, no specific paper focuses on specific differences of navigation strategies between typical Chinese and other groups. Nevertheless, these are likely to emerge in upcoming reports of research and practice. Kirstin Röse, who has published several papers studying intercultural differences [14-16] comments that one cultural difference in Web navigation seems to be a

preference to provide many major destinations at once up front, rather than revealing menu selections one at a time.

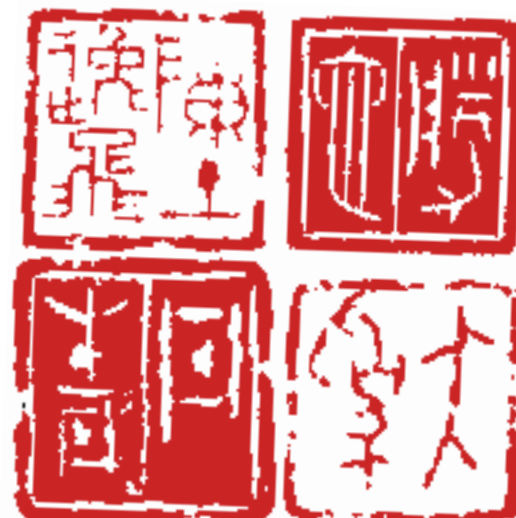
Interaction

Among other significant differences of user-interface design are the importance of tone-based spoken languages, such as Chinese, which emphasize the rising, falling, up-down up, and "flat" tones of each sound. Recognition and display systems must account for these auditory characteristics; in addition, experiments are being carried out to mark and display the emotional content of speech in addition to basic tonal inflections [20].

Chao et al. [3] studied Chinese attitudes toward time using the culture model of Hall [5], which predicts that such Asian people are polychronic, that is, doing many things at once. They note that four factors influence Chinese workers in their attitudes toward tasks: individual character (introverts tend toward monochronic orientation and extroverts tend toward polychronic orientation), traditional social systems, task types, and working environments. They found that the Chinese were more complex than predicted by previous classical models and that their behavior seemed to be task dependent.

Appearance and Presentation

Many analysts of visual communication have noted significant differences in color associations and typographic reading strategies among Chinese and their Western counterparts. Chinese characters, long ago derived from pictographic signs, contain complex marks within a square format for each complete character. The



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writing system, which until recently was predominantly written in top-to-bottom, right-to-left sequence, has recently begun to change. The government has decreed that left-to-right, top-to-bottom, is preferred, and major newspapers recently switched.

Dr. Wangli Yang is director of the Usability Research Center, Legend Holdings, Ltd. Legend is the largest homegrown information technology company in China, with 20,000 employees. At a special workshop at APCHI 2002 on usability issues she helped to organize, she commented that Legend has been studying cultural differences among Chinese users and has noted significant differences among five geographic regions of China: north, south, east, west, and central. She noted that users in Sichuan, a southern province, preferred stronger, more vibrant colors for products, whereas users in a northern province like Hebei, near Beijing, preferred more subdued colors. Detailed anthropological and cultural studies of the various regions exist in China, but they are generally published in Chinese and are not easily available to Westerners.

Conclusion

Major differences between Western and Asian, specifically Chinese, ways of communicating and interacting pervade all aspects of how each group understands daily life and how each group behaves in daily activities. It seems likely that studies conducted in China eventually will become known to Westerners. Western countries, eager to do business with the Chinese, will continue to investigate differences among Chinese, Western, and other Asian countries, as Siemens, Kodak, and Nokia, among others, have been studying. The monolithic, one-dimensional picture of the Chinese that has figured in many Western studies will give way to more nuanced under-

standing that reflects the diversity and extent of Chinese culture.

In the late 1970s I had an opportunity to work on a project to diagram global econometric planning models at the East-West Center in Honolulu, Hawaii, a center for technology and cultural exchange of Pacific Basin countries. I was astounded to learn that most models of the world's economy did not consider the economies of the Soviet Union and China, because at that time so little information was known, and the economies of these two great Communist superpowers were closed within themselves. Today, 25 years later, the world's economies are tightly intertwined. As many business and technology publications make clear, we cannot ignore the interrelationship of China with the rest of the world.

Likewise, the user-interface design community increasingly will need to exchange information with Chinese counterparts and take into account their experience when philosophizing, analyzing, and designing the computer-based human experience. A SIGCHI China group is already forming. Interested readers can contact Prof. Zhengjie Liu, Dalian Maritime University (liuzhj@dimu.edu.cn), for more information. In this century we will certainly see major shifts in knowledge, culture, commerce, communication, and interaction. The journey with China involved as a major participant will be an exciting and rewarding adventure in the future history of user-interface design.

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