

The Cultural Usability (CULTUSAB) Project: Studies of Cultural Models in Psychological Usability Evaluation Methods

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Abstract. Cultural models in terms of the characteristics and content of folk theories and folk psychology have been important to social scientists for centuries. We suggest that they should be at the heart of the scientific study of human-computer interaction (HCI). The CULTUSAB project is conducting an in-depth investigation of the key dimensions of culture that affect usability testing situations, including language, power distance, and cognitive style. All phases of the usability test are being evaluated for cultural impact, including planning, conducting, and reporting results. Special attention is being focused on subject-evaluator communication and cultural bias in the test design and structure of the user interface being tested. Experiments are being replicated in three countries: Denmark, India and China. The research will result in new testing methods and guidelines that increase the validity of usability tests by avoiding cultural bias, and allow us to produce comparable results across different countries.

Keywords. Cultural usability, think aloud usability test, cross cultural research.

1 Introduction

The CULTUSAB project aims to investigate the impact of culture on the results of established methods of usability testing. Cultural models in terms of the characteristics and content of folk theories and folk psychology have been important to social scientists for centuries. From Wilhelm Wundt's Volker psychology to the distributed and situated cognition theorists in the global world of today, thinkers have seen human action as being controlled by cultural models. Cultural models for humans interacting with computers should therefore be at the heart of the scientific study of human-computer interaction (HCI).

Historical imperatives aside, there are numerous indications from practical experience that usability testing procedures developed for use in Europe or the US do not necessarily give the same results when applied in India or China. The CULTUSAB project is conducting an in-depth investigation of the key dimensions of culture that affect usability testing situations, including language, power distance, and cognitive style. All phases of the usability test are being evaluated for cultural

impact, including planning, conducting, and reporting results. Special attention is being focused on subject-evaluator communication and cultural bias in the test design and structure of the user interface being tested. Experiments are being replicated in three countries: Denmark, India and China. The research will result in new testing methods and guidelines that increase the validity of usability tests by being sensitive towards cultural bias, and allow us to produce comparable results across different countries. This 3-year research project started in May, 2006, sponsored by a grant from the Danish Research Council to Copenhagen Business School. India Institute of Technology-Guwahati, the Chinese Academy of Sciences, University of Copenhagen and Roskilde University are co-investigators. Industry advisors to the project are from Honeywell, Nokia, Human Factors International, and Snitker Associates.

2 Motivation and Purpose

With the advent of globalisation and the information technology revolution in developing countries, we can no longer overlook the aspect of culture in the design of user interfaces and interactive products. We need to understand and accept that there are significant differences in how people with different cultural backgrounds respond to directions and test methodologies. From the lab of the very large IT companies in Beijing to the design departments at India's finest institutions of higher education, there is a call for adequate methods and techniques for designing human-computer interaction. Usability issues such as how to support input to computers of the many Chinese characters within a classic windows-and-mouse paradigm, or how in a multilingual and multicultural country as India to design and evaluate the usability of interfaces to Automatic Teller Machines and other text-based interactive products must be addressed. In Denmark and Europe we face even more complex challenges to the quality of information and communication technology, as our societies turn increasingly multicultural and we must provide networked information to both ethnic majorities and minorities. Despite of these challenges, we do not have any kind of formal methods which guides us to evaluate a product to a certain standard while keeping sensitivity to cultural issues. With this project we take as our point of departure the issues of how to avoid cultural bias in requirements elicitation and usability data collection. Which user-based evaluation methods do address cultural diversity in both the moderator and user? We study the fundamental and widespread assumption that the usability evaluator needs to have the same cultural background as the test user in order to completely understand how users will respond to the test instructions and test methodology. Furthermore, we aim to understand what the effective way to obtain test users' usability feedback is, without actually disguising the usability problems. Our research question is:

What is the impact of culture on the results of established methods of usability testing?

- How are the different components of a usability test, e.g. planning, performing and reporting, influenced by a cultural diversity of users and contexts of use?
- How are cultural backgrounds taken into account when recruiting and describing usability test users?

- Which form of relations and communications between evaluators and test users are most effective in terms of finding relevant usability problems in culturally localized applications?
- What is the nature of common cross culturally related usability problems, and what is a good quality of cultural usability of information and communication technology?

2.1 Cultural Usability and Usability Evaluation Methods

A focus in this project is Usability Evaluation Methods (UEMs), as defined by [7]¹. In the industry, a wealth of UEMs is used to evaluate computer software user interfaces and other interactive products: Inspection methods, Workplace observation, Think-Aloud Usability Test, etc. Both in the industry and in research there is an interest in understanding cultural issues because there are many cultural factors that influence usability evaluation results. Some have to do with culturally biased guidelines and procedures in using a specific UEM, while others are related to other types of cultural differences appearing in test situations. There is an entire spectrum of factors ranging from those completely independent of the UEM to those that are practically built-in in a particular UEM. For reasons of comparability, the project needs to consider more than one type of UEM.

The theoretical part of the project will analyze the concept of ‘cultural usability’ through analysis of the use of UEMs within a cultural and social diversity of users and contexts. The international diversity of users and contexts of use is an expansion of the traditional usability research, which is based on more simple, regionally specific conceptions of users [4, 11]. The research methodology, mostly qualitative, allows for in depth investigation of the conceptual and practical layers of user and context representations in established UEMs.

3 Background

The discussion about culturally localised interfaces has been fairly conclusive on the point that localization is not just mere translation of text, it’s more than that [14, 15]. To locally adapt user interfaces, we must use usability engineering methods similar to those used in the development of original user interface. However, the existing practice derived from the West of migrating software from a source culture to a target culture may work in the design and implementation phase, but not in the usability evaluation phase [22]. For example, in Malaysia having a test user of higher rank than the experimenter will result in more negative comments about the product than having a test user of lower rank than the evaluator. In some countries testing subjects individually should be avoided, as little information may be retrieved [8]. In an interview study done in India, those participants with a similar socio-cultural background as the interviewer (India) brought more usability problems than participants who were interviewed by the interviewer with a different socio-cultural

¹ UEMs is a broad term for analytical and empirical methods that usability professionals use to evaluate the interaction of the human with the computer with the purpose of identifying aspects of this interaction that need to be improved to increase the usability of the product.

background (in this case Anglo-American) [19]. Others have raised similar issues: Do language and cultural differences between staff and participants negate the outcome of usability tests? Are foreign nationals good representatives of users in their home country? These practical issues are of great importance to the design and use of usability evaluation methods.

The background for many studies of cultural aspects of usability are Hofstede's cultural dimensions [9]: power distance, individualism-collectivism, masculinity-feminism and uncertainty avoidance. Most culture and design theorists, many professional designers across all disciplines and also some users believe that these cultural dimensions pervade every human activity and every artifact, including user interfaces [13]. Recently, however, opponents of this approach argue that the current process for the design of universally usable systems is not appropriate, because of its overdependence on guidelines, difficulty of determining the user from the present cultural grounds, its tendency to build stereotypes which later become design rules, and its treatment of different cultures with one specific language that doesn't take into account cultural heterogeneity.

Instead, these researchers see culturally determined usability problems in interfaces as caused by the users' (mis-) understandings of the representations whose meaning lie in the culture-specific context [1]. This conceptualization of cultural usability is in line with more recent social psychological approaches to culture that take into account the establishment of 'social facts' and peoples' sense of the 'reality' of social groups, and see these as effects of peoples' use of symbols to construct their social reality; processes that again are firmly related to culture and communication [12]. These processes are important for cultural usability. For example, in our pilot studies in India and Denmark of the thinking aloud usability test method [5, 21], the test users quickly realized that some test evaluators did not belong to the user's own social group, and acted accordingly by explaining to the foreign evaluator aspects of the test application that would seem to be obvious and not require explanation to an evaluator from the same group. In the end, this meant that some relevant usability problems were not identified due to cross cultural issues.

4 Approach and Method

We base our approach on a moderate universalism [16]: 1) maybe there is cross cultural universal usability, maybe there is not, we need empirical documentation, 2) universal usability will most probably be found on the level of theoretical principles rather than phenomena, and 3) we need to make assumptions about universal usability to help organize data into general theories. With this we look away from the two sisters of universalism [17]: evolutionism (one society is more advanced than others) and relativism (societies must be understood from their own perspective) approaches, in order to create the best ground for comparability of results and collaboration among the researchers in the project.

4.1 Social Psychological Approach to Cultural Usability

In the study of UEM in a cross cultural perspective, we suggest to apply a social-cognitive model of culture [10] that conceptualize culture as a loose network of

domain-specific cognitive structures (including theories, beliefs), and, furthermore, argues that an individual can hold more than one cultural meaning system, even if the systems contain conflicting cultural theories. Depending on the accessibility, availability and applicability of such cultural knowledge, cross-cultural differences may impact usability.

Accessible cultural knowledge can be approached as meaning systems that are widely shared among members of a cultural group and frequently used in communication among members and thus becomes chronically accessible. In a usability test situation, where people under time pressure look for readily available and widely accepted solutions to a problem, the chronically accessible knowledge will be used and typical cultural group differences will emerge.

It is however not sufficient to have task conditions that favor the use of chronically accessible cultural knowledge. Since individuals in a society increasingly are poly-cultural in their background and thus have more than one implicit theory of how to perceive and act in a given situation, the individual chooses or implicitly applies the theory that is most accessible in that situation. Therefore, in the study of UEMs it can sometimes be necessary to ensure the availability of culturally accessible knowledge by including ways to activate or 'prime' this knowledge. Such primers can be cultural icons and pictures. For example, we can test localized IT applications that contain culturally specific icons and pictures that can prime evaluators' and test users' culturally specific knowledge systems, while they complete a behavioral strategy such as a think aloud usability test.

In our approach, we suggest to deal with the assumption about appropriateness of applying cultural knowledge by pairing evaluator and users of different respectively similar socio-cultural backgrounds. In order not to miss significant parts of the social realities of a postmodern world [2], we can study UEMs that are performed at different 'home grounds' such as China, India and Denmark. A great variability in sub-studies will be needed in order to estimate the universality of claims about cultural usability in the project. The glue that can bind such sub-studies together will have to be that individual researchers are present at the studies and field experiments which are done at the other researchers' home grounds.

5 Expected Outcomes of Cultural Usability Research

5.1 Practical Application of Results

Studying cultural usability will have significant societal impact on issues related to cultural aspects of interaction design and usability testing. Local usability professionals will improve their understanding of usability in other parts of the world and their ability to configure usability evaluation methods cross culturally in other nations or in ethnic minority settings within the nation or region. An understanding of the cultural aspects of usability will help the designer and developers to analyze the ontology of the application domain of a system by revealing the semantics of the domain from the users' many points of view. The openness of the technology for a wide range of interpretations makes it very important to develop UEMs that help the designers and developers to investigate the use of technology on many levels of detail

within society. This is very important in current efforts in coordinating between incompatible system development methods such as the natural science-oriented object-oriented analysis and design approach versus the humanities-oriented interaction design approach to usability [6].

5.2 Publication of Results

Results of cultural usability research should be publishable in high level international HCI journals such as *Interacting with Computers*, *Behaviour & Information Technology* and *International Journal of Human Computer Studies*. One obstacle for publication may however be the need for a cross-cultural research design which makes the research more complicated to communicate. Before being published in journals, findings may have to be presented and discussed with researchers and industry at appropriate national conferences such as the annual Danish HCI research symposium, the INDIA HCI conferences and HCI International 2007, Beijing.

5.3 International Collaboration and Methods Development

In developing the methods of testing intercultural usability evaluation it is at the same time necessary to develop and evaluate the methods for doing so. Moreover, the intense collaboration between HCI researchers from different regions of the world in specific projects, from field testing to analysis and publication, will strengthen research networks between the countries involved and pave the way for future research in this and related areas which will benefit all the participating research institutions and researchers and their students, see e.g. [18] for an example. Opportunities to cooperate about research in cultural usability with HCI researchers from the emerging HCI communities in developing countries across the world should be exploited rigorously, e.g. [3, 20].

5.4 Educational Benefits

The educational significance of the project lies in that students will benefit from the global perspectives on human-computer interaction. While of potential interest to all HCI students of today, Cultural Usability research should be of special interest to students having a multicultural background or expected career in a multicultural environment.

5.5 Future Research Agenda

The next research in cultural usability may focus on the training of users as part of improving the usability of information and communication technology. As we know from numerous studies, there are high costs associated with learning to use new systems and with the social psychology of the surrounding cultural and communicative processes.

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