The Art of Cross-Cultural Design for Usability

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Abstract. More and more HCI researchers and practitioners have realized the urgency of addressing culture as being more than just an interface tuning parameter. Recent publications, project initiatives and a growing number of globally dispersed collaborating workgroups explore cultural models for practical solutions. Yet many endeavors focus on singled out aspects thereby missing fundamental factors of cross-cultural design and evaluation such as contextual connotations, dynamics and integration. Thus a common research agenda should therefore be the de-construction of the entire process as a basis for a comprehensive integration of shared experiences, best practices and tested models to enhance cross-cultural design and evaluation.

1 Introduction

Designing usable information technology (IT) across cultures is an art, for it being highly creative and sensitive, situational unique, and contextually self-defined, ideally leading to a synergism of the created artifact with its environment. The designer must poses skills and master techniques required for the specific development context. However the understanding thereof has been lacking and the consequent challenges were underestimated in the past. Looking at the history of cross-cultural IT design and usability evaluation shows the originally naïve assumption that IT, being value neutral, only needs to be slightly adapted to its new environment. However Del Galdo and Nielson [3] at an early stage already discovered the necessity to add two more levels to software localization, namely the adaptation of usability methods to specific countries as well as the design of user interfaces in accordance with cultural models of how local people work and communicate. Many practitioners and a few researchers, rushing to find practical solutions, have overestimated available cultural models. Through a high abstraction specifics, unique to each development situation, are lost. Essential elements and relevant relations within the context are omitted of the process and product. Thus Young [17] argues "that the current state of research representing culture in the design of ICTs serves a limited scope of what culture can be in the design process". She requests designers to rethink the integration of culture in the design process while revealing their need for guidance in the form of frameworks and models.

In this paper, the author will illustrate that the manifold experiences and theories in cross-cultural design and evaluation are not comprehensive as yet. Only a full understanding of the cultural flow will facilitate a complete integration.

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2 The Forgotten Links

"Current approaches of using cultural models in software design and evaluation do not necessarily imply major usability improvement."

At first this statement seems rather provoking and absurd, as the obvious aim of using cultural models is to overwrite the IT intrinsic values by the users' values. However, looking at the means of penetration of intrinsic values in IT solutions shows the relative weakness of current approaches of integrating cultural models, to explicitly implant users' values.

2.1 IT Intrinsic Values

Commonly, as part of the development process a solution is modeled based on an abstraction of how the creator perceives a given reality [5]. Perception is based on the individual's cultural background. Thus IT creators model IT solutions according to their cultural background [13]. This is often explicitly expressed in statements such as this:
"As designers, we are naturally interested in facilitating these groups to use information technology in an effective, efficient, and sustainable way to further their goals" [9].

The propagation of western values in IT solutions is therefore established through the believed-to-be universally valid conceptualization of Software quality criteria, established methods and metrics [15]. For example the concept of usability, left unquestioned by the majority of researchers, is commonly considered equivalent to effectiveness, efficiency and satisfaction. It is therefore measured with methods such as GOMS and Think Aloud Task solving, in terms of number and time of task completion. However previous research by the author and colleagues has revealed that usability criteria such as task completion time are largely irrelevant in the Namibian context [14]. Further brainstorming sessions and focus group discussions with different Namibian user groups have evidenced a significant deviating understanding of usability from the commonly assumed one [15]. Thus all usability evaluations have, in the absence of a contextually redefined usability concept, examined human computer interaction qualities not necessarily applicable to the local user group. The twofold bias of usability evaluations, one through the underlying definition of usability and two through the application of specific methods has substantially contributed to the preservation of western values in deployed IT solutions [16].

2.2 Cultural Models -The Rescue-?

A number of cultural models have found their way into the HCI community, among the most cited are Hofstede's, Hall's, Victor's and Trompenaar's theories. These anthropologists have identified cultural dimensions, which explicitly differentiate cultural groups from each other in their way of thinking, feeling and acting. Hofstede [7], for example, differentiates the following dimensions: power-distance, collectivism vs. individualism, femininity vs. masculinity, uncertainty avoidance, long- vs.

short-term orientation. Such models are used to guide interface design as well as adapt usability methods.

Cultural Model as User interface Design Guidelines. The interest in cultural models by the HCI community has certainly increased since Marcus and Gould [8] have derived user interface guidelines directly from cultural dimensions. They suggest, for example that information structuring should directly correlate with the level of power distance, e.g. high power distance users require highly structured information presentation while low power distance users require less structured information presentation. These guidelines seemed like a welcome fast and cheap solution to develop applications for other cultural groups. However the linear mapping of single high abstraction level dimensions to specific user interface features has not proven its validity as yet [15]. Fitzgerald [4] concludes from his work on cross-cultural website design, that cultural models are rather culturally descriptive than interface directives. Remembering the intentions, context and authors of the cultural models raises doubts as to the adequacy and applicability for a different purpose namely the design of IT systems for specific groups. Many questions remain such as, why those specific cultural determinants? Are they relevant and complete in terms of what is pertinent for HCI? How can we derive user interface guidelines from the models at hand?

Problematic, furthermore is the currently limited integration of a cultural model into the whole process of IT design and evaluation. The restriction to user interface feature determination leaves the underlying usage values or quality criteria untouched thus in conflict. E.g. in Marcus and Gould's [8] early work the suggested correlation of power distance and information structuring, has an underlying assumption of striving towards effectiveness and efficiency of information access in any cultural context. However those values are not necessarily part of the target users' culture. Equally striking is the research presented by Ford and Gelderblom [6] in which no correlation could be established between South African user performance and cultural specific website characteristics using established usability evaluation methods. Such comparisons demonstrate the application of a cultural model to a singled out phase of design and evaluation only.

Cultural Models in Design and Evaluation Methods Adaptation. On the other hand, failures or successes reported about the application of common HCI methods in different cultural settings, can in most instances, retrospectively be linked to cultural theories. E.g. Trillo [11] reports on a lack of participation of females in a focus group in Tokyo. However would the facilitator have considered the Japanese gender determinant, which is one of the highest in the world (95) [8], would (s)he have adapted the method by not mixing genders and rather had separate sessions. We have had similar correlative experiences over the last decade evaluating the suitability and adaptation of methods in Namibia, a Southern African country. At first striking was the lack of criticism, no matter how "bad" a presented prototype was. However, understanding the cultural background with its immanent hierarchies, depicting a high power distance, explains the absence of expressed criticism to perceived respectful people such as teachers or developers [13]. Early user involvement in design and the usage of peers for evaluation increased the user feedback drastically. Similarly,

having changed individual think aloud evaluations to group discussion evaluations, thereby considering the Namibian collectivistic[1] culture, has improved the quality and quantity of feedback [14]. In an attempt to identify "usability" connotations we have run a couple of successful term brainstorming sessions with different user groups. However in one of the sessions, where the user group consisted of only Hereros, one of the indigenous ethnical groups, the brainstorming approach was neither understood nor practicable. Instead the group elder filled the allocated time with narrating detailed stories on "usable" items in his life. Only a few inserts from other participants were recorded. Comparing this with experienced local communication customs does mirror the session behavior of the group; e.g. the eldest speaking first and most, leading the conversation, and communicating information through high context stories. The latter observation has for example been successfully used in Indian usability evaluation sessions where tasks are embedded in Bollywood stories to create an interesting context [1]. This demonstrates the importance of adopting indigenous communication strategies for the design and evaluation sessions. Furthermore do Shi and Clemmensen [10] argue, based on Nisbett[2] 's theory, that differences in thinking patterns influence the ability of think aloud evaluations; e.g. linear and analytical (western) thinking can be easier expressed during a task execution than circular and holistic (eastern) thinking. They therefore suggest the use of retrospective thinking aloud evaluation for eastern users. Those examples exhibit the vast experience in the usage of cultural models and theories to adapt methods to a specific cultural context.

However cultural models, describing one cultural group in isolation, exclude the situational dynamics originating from the interaction between the parties involved in the design and evaluation process. The influence of the interplay between designer/evaluator and user depending on their respective cultural backgrounds has been demonstrated in different studies. Vatrapu and Pĕrez-Quiñones [12] have evidenced the difference in usability evaluation outcomes depending on the evaluator-user pairing. The studies are based on structured interview techniques with different evaluator-user pairs from Europe and India. In Namibia the feedback depends on the perceived position of the evaluator by the user [13, 14]. Similar results have been obtained in studies conducted by Clemmensen and Plocher [2] in which users and evaluators from Europe and India were paired in all combination possibilities. A great variation in terms of outcomes depending on the pair was recorded. In these studies the local-local pairing prevail in identifying culturally specific problems. Shi and Clemmensen [10] remark, that "the appropriateness of a given cultural theory/knowledge depends on who the individual is together with. Sharing knowledge of usability problems and coordinating descriptions of usability problems depend on the mutual perception of group belongingness." They further explain that because Eastern societies are socio-emotional oriented their users may be more influenced when they are with foreign evaluators. In an attempt to capture this dynamic relationship Clemmensen and Plocher [2] introduce a cultural usability model, which distinguishes the user's

[1] Anecdote: Students who were asked to bring a user to the prototype evaluation session brought 20 users at the same time instead.

[2] Nisbett, R.E., The Geography of Thought. 2003, London: Nicholas Brealey Publishing (as referenced in Shi and Clemmenssen 2008).

internal cultural model of technology use, external artifacts and institutions. However, once more the model assumes that every individual strives for effectiveness, efficiency, and satisfaction of interacting with a product.

2.3 Understanding the Cultural Flow in a Cross-Cultural Process

Figure 1a depicts the previously discussed cultural influences of the developer, the users and the usage of cultural models within a cross-cultural design and evaluation process. The different colors represent the different value systems, e.g. red the western culture and blue any other culture. The IT experts who determines the design and evaluation process, usually adopts the common usage values, as set by western bodies, and chooses the methods, in some instances informed by cultural models. The later usually serves as guidelines for the design of the user interface only. In a later stage users are then involved for the evaluation. Thus depending on the intensity and interplay of user involvement, the usage of a cultural model to inform the choice of methods or the user interface only, the IT solution will carry a percentage of the developer's and user's cultural values. Striving for a synergy of users and deployed IT solution, the aim is to increase the users' cultural values and minimize the western developers' intrinsic values in the final solution. The current usage of cultural models and user involvement does not sufficiently take into account the strong influence of the developer's cultural background as well as the western values anchored in the assigned software quality criteria as well as the design and evaluation methods. Thus the inclusion of cultural models and users does have no major implication on the outcome. Only a full integration of an adequate cultural model and users in the cross-cultural design and evaluation process will drastically improve the final solution. Figure 1b depicts an integrated approach with a stronger users' cultural flow.

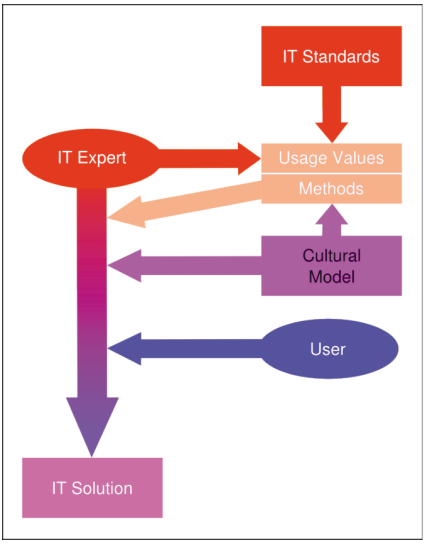

Fig. 1a. Cultural Flow in current process

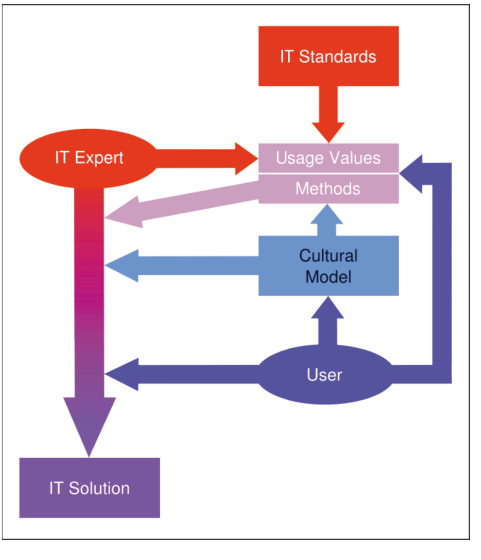

Fig. 1b. Cultural Flow in integrated process

The cultural flow model clearly shows the delicacy of such a cross-cultural process, as well as the interplay between the people, techniques and standards involved. As each design evolves in its own specific context the developers' skills and understanding of the cross-cultural context determines the success of the outcome. Developers, in their role as cross-cultural process facilitators must be aware of their own cultural background as well as be able to anticipate the given cultural context. Developers have to accept that well-known practices might be inappropriate and that a cross-cultural design and evaluation process always is a mutual learning process. Thus the artful creation of a synergy requires high creativity and sensitivity within a unique situation of a cross-cultural context. A comprehensive cultural model should therefore address contextual connotations, the dynamics and its integration.

3 Outlook

Many valuable cross-cultural experiences have been reported, which contribute to guidelines and best practices in cross-cultural design and evaluation. However overestimating the strength of current cultural models and their lack of appropriate integration in the entire process does not result in, as intended, locally usable solution. We need to understand the complete cultural flow within the design and evaluation process as well as the requirements of a cultural model to be beneficial to this process. One common research agenda of the HCI community should be the establishment of relevant cultural models and their integration into the cross-cultural design and evaluation. In a first step HCI specific determinants should be identified. An analysis of in the literature reported causes of failures of application of common methods can substantially contribute towards the identification of pertinent cultural determinants. For example, most Namibian participants would not fill in a questionnaire truthfully but rather put the assumed expected answer [13]. Thus an indicator to consider for the HCI cultural model would be the expectation relevance factor. Furthermore mapping cultural dependent communication and thought patterns to the design of HCI interfaces means abandoning many familiar features.

As to the integration in the process a meticulous de-construction of cross-cultural design and evaluation should be on the agenda to facilitate a successful integration of best practices.

This paper has demonstrated the global variety of relevant research results, which yet are lacking consolidation. The author hopes to initiate such an endeavor within the HCI community to improve the cross-cultural design and evaluation process aiming for cultural usability.

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