Reprint of A process model for developing usable cross-cultural websites

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ABSTRACT

In this paper we present a process model for developing usable cross-cultural websites. Compatible with ISO 13407, the process model documents an abstraction of the design process focusing on cultural issues in development. It provides a framework in which a variety of user-based and expert-based techniques for analysis and design are placed within the life-cycle of website development. In developing the model, we relate practical approaches to design with theories and models of culture and discuss the relevance of such theories to the practical design process. In particular we focus on four key concerns: how an audit of local website attractors can inform the design process; the concept of a cultural fingerprint to contrast websites with the cultural needs of local users; the problems associated with user evaluation; and cross-cultural team development. We then show their relation to our process model. We conclude by summarising our contribution to date within the field.

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1. Executive summary

This paper provides a process model for the development of usable cross-cultural websites based on the authors' academic and professional research in this field of development. For international websites to be successful many organisations are now beginning to realise that they need first to understand, and then address the needs of a culturally diverse user base. The problem is that people differ across regional, linguistic and country boundaries and user requirements are strongly influenced by their local cultural perspective. Cross-cultural usability is about making websites an effective means of communication between a global website owner and a local user.

The process model set out in this paper documents an abstraction of the design process focusing on cultural issues in development. It provides a framework in which a variety of user-based and expert-based techniques for analysis and design are placed within the life-cycle of development. In the paper the authors propose a number of approaches for different stages of development from requirements to design, from user involvement to multi-cultural development teams and to user evaluation. Three key issues underpinning usable website development in a global context are considered in detail—*requirements for design, tools for design (interpreting requirements)* and *strategies for evaluation*. The rationale for our process model is the belief, based on evidence from both the-

ory and practice, that traditional methods of analysis and interface design are not fully adequate for identifying the requirements for cross-cultural websites.

Firstly we introduce the concept of *cultural attractors* to define the interface design elements of the website that reflect the signs and their meanings to match the expectations of the local culture. The cultural attractors typically comprise of: colours, colour combinations, banner adverts, trust signs, use of metaphor, language cues, navigation controls and similar visual elements that together create a 'look and feel' to match the cultural expectations of the users for that particular domain. The paper describes some studies in India and Taiwan applying these concepts. A long-term aim is to develop a set of comprehensive cultural attractors and their meanings derived from cultural site audit(s) for each particular culture or sub-culture and the domain of the e-market. Such an approach holds considerable potential for localisation companies and others to create reusable libraries of such sets of cultural attractors and their meanings that would provide a set of useful building blocks for future commercial web-site localisation projects.

The paper then discusses a number of cultural models that can assist cross-cultural developers. An issue that concerns cross-cultural developers is the validity of cultural models derived from other disciplines. The paper describes two studies of Chinese websites aimed at verifying cultural dimensions. The websites chosen possessed different levels of the dimensions of *power distance (PD), individualism/collectivism (IC), masculinity/femininity (MF)* and *uncertainty avoidance (UA)* as rated by using Marcus and Gould's guidelines for international website design. The studies

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provide only limited evidence to support these cultural models. The question we are beginning to answer here is the extent to which generic cultural issues really affect website usability and acceptability, and how this information can be easily communicated to developers and site owners. In the case of China the four dimensions have greatly differing significance. PD is very important, and masculinity/femininity less so, but international website designers would be ill-advised to ignore either of these two issues. Contrary to expectations, individualism/collectivism is not important to Chinese users and global expectations of the web would seem to predominate.

A key issue that has emerged from international usability projects in which the authors have been involved is the need to provide an accessible means through which the cultural characteristics of a particular website can be discussed with clients who would be unfamiliar with theoretical cultural models. In response to this need we are developing the concept of a 'cultural fingerprint' which can diagrammatically compare the cultural profile of a website (Site Fingerprint) with that of its target cultures (Country or Culture Fingerprint). From a study of Chinese websites the authors present the country fingerprint for China.

A further section of the paper concerns the important issue of user evaluation. It recognises that 'traditional' methods of user testing are difficult and costly to operate across cultures and remote geographical locations. There is the problem of successfully engaging with users from different cultures within the user testing process itself, whereas at a higher level the whole concept of user-centred design (UCD) and participation may be difficult for multi-national development teams. However, overall we believe that it should be possible to develop guidelines for specific cultures and contexts.

Culture and user participation are also discussed. The authors suggest that the motivation for user involvement may be the result of Western culture's view that users as individuals have a democratic right to be involved in the development of software they are expected to use, and that these assumptions cannot be automatically transferred to other cultural environments and can cause misunderstandings in cross-cultural development teams. The results of a study of developers' attitudes highlights that cross-cultural difficulties are to be expected and that the choice and deployment of development methods need to recognize this issue.

In the context of user evaluation the paper reviews the existing guidelines and distinguishes between internal and external cultures. In 'external' cultures user evaluation should be based wherever possible on teams of users and evaluators from the same culture, while in dealing with 'internal' cultures this is less important. Further work is continuing to discover which tools and techniques were particularly sensitive to cultural factors.

Finally these approaches are drawn together within the framework of a process model. As with ISO 13407 our process model (Fig. 10) comprises of five stages, four of which are implicitly joined in a loop. Although the process is iterative it could be converted to a waterfall life-cycle model by simply going through once only. However, the true benefit of this model emerges when it is used to guide an iterative development process. In cross-cultural development there needs to be a strong relationship between cultural theory and commercial practice so that by an iterative process of design, evaluation and reflection on theory an improved product can be obtained.

2. Cross-cultural web development

The website is now an established channel of communication between a whole variety of organisations and their diverse groups of stakeholders. In the e-commerce environment, for example, the web makes a global market accessible to even the smallest company. However, for international websites to be successful many organisations are now beginning to realise that they need to understand, and then address the needs of a culturally diverse user base. A survey by World trade (2000) in the e-commerce arena echoed the view of researchers in cross-cultural usability that the more organisations adapt websites to local markets, the more successful they should be. As Word Trade summarise, putting the 'think globally, act locally' principle into action, is not simple but the rewards can be large.

The problem is that people differ across regional, linguistic and country boundaries and user requirements are strongly influenced by their local cultural perspective. Cross-cultural usability is about making websites an effective means of communication between a global website owner and a local user. Using the Internet to facilitate communication may be a relatively new phenomenon but in order to fully understand it we need to start by investigating the much wider research area of intercultural communication. Although the roots of intercultural communication can be traced even further back, the anthropologist Edward T. Hall established the original paradigm for intercultural communication. Hall has described culture as a selective screen through which we see the world, and believed that basic differences in the way that members of different cultures perceived reality were responsible for miscommunications of the most fundamental kind (Hall, 1959).

Addressing cultural differences means designing and building websites specifically for a global cross-cultural audience. In fact producing good international software products has always been difficult and there are many examples in the past of systems that have failed or caused their users great problems (Del Galdo, 1990). Cultural differences have significance not only for the design itself but also for the process of design. Firstly there is the choice of overall strategy, to develop an international culturally free interface or to provide localised versions. Day (1996) describes three levels of specialisation:

- globalisation, applying an allegedly culture-less standard to be used across different cultures,
- internationalisation, designing base structures for later local customisation,
- localisation, developing specific interfaces to meet particular local markets.

Cultural diversity makes it unrealistic for designers to rely on intuition or personal experience of interface design. However, designing multiple interfaces for different user groups adds significantly to the cost of development. It is important to focus on design characteristics that are sensitive to demographic differences, but it is often not clear what these are. We identify two broad types of usability issue inherent in international website design. Firstly there are easily identifiable 'objective' issues, such as language and format conventions, that are straightforward to address. Although important, such issues are not the concern of this paper. Here we are interested in 'subjective' issues, those that focus on the ways in which people in different cultures interact with computers and websites. The underpinning cultural and cognitive dimensions of website usability have major implications for the process of international website design.

A key issue in the design of international websites is effective usability evaluation. There are, however, huge difficulties in user evaluation for both localisation and internationalisation for multicultural systems development. In relation to *expert/heuristic evaluation* problems involve the degree to which existing web design guidelines are culturally biased and how to develop multi-cultural heuristics. In relation to *user testing*, it is necessary to test with