

INM313 – Inclusive Design

Designing an accessible portable information appliance for visitors attending the 2012 London Olympic games

Cultural Considerations

ABSTRACT

The globalisation of information and communication technologies has raised the awareness to cultural differences within the HCI (Human-Computer Interaction) community, and specifically to how these differences and cultural attributes affect user interaction. Research in this area has focused on general cultural studies and cross-cultural psychology, as well as empirical work. The following report offers a literature review, analysis and design guidelines suggested as part of an academic group project aimed at developing an accessible information device to be used by visitors attending the London Olympic games in 2012. This document addresses the cultural aspects of the project and describes how the ultimate design solution could be made accessible to a culturally diverse group of users.

TABLE OF CONTENTS

1.0 Introduction 4
2.0 Literature review 4
3.0 Analysis..... 5
 3.1 Characteristics 6
 3.2 User needs 6
4.0 Project recommendations 6
5.0 Support for other groups 7
6.0 Conclusions 7
7.0 References 8

1.0 INTRODUCTION

The Olympic games are an international mega-event held every four years, bringing together countries from all over the world who compete in a wide variety of sporting activities over a period of two weeks. The games attract a large amount of spectators from all corners of the world who arrive at the host city to support their nation's athletes and enjoy the Olympic experience. The massive scale of the Olympic games and the fact they are held in a foreign country makes that experience quite a challenging one for many visitors. Not only are they tourists, but they are also attending a huge event. Under such circumstances, the need for up-to-date information and overall assistance becomes much greater.

Information and communication technologies can support spectators in various ways during the games. For example, provide up-to-date information about which events are being held, where are they taking place and what is the best way to get to them. The target audience of such potential technological solutions can be described as extremely diverse. Although cultural differences may seem to be the main issue at first, a closer look reveals that there are many other differences, which have a profound impact on the way in which people interact with technology. These differences include age, visual and auditory abilities, motor abilities and various cognitive abilities and conditions.

Acknowledging these differences raises the need to explore how populations with special needs can make effective use of the end solution just like anyone else. This is a complex and challenging task as requirements may conflict, resulting in inevitable trade-offs. Still, even a certain level of accessibility is better than a totally inaccessible product. In that context, considering cultural diversity falls under cognitive considerations as a person's cultural background shapes his or her perception, behaviour, expectations etc.

This report focuses on the cultural aspects of designing an accessible information device, which is meant to be used by people attending the 2012 Olympic events. It includes a literature review of culturally informed design, exploring different approaches in this area, which are then analysed and presented as specific cultural characteristics and needs of all spectators. All these lead to practical recommendations, which should be considered as part of the development process of the Olympics information device.

2.0 LITERATURE REVIEW

Globalisation exposes worldwide cultural differences amongst users (Marcus & Gould, 2000). Since information and communication technologies originated primarily in North America, they reflected the values and perceptions of people from that part of the world and took into account their mental models (Sacher et al., 2001). As information technology became global, mainly due to the wide spread adoption of the internet, cultural background had to be addressed in order to ensure product acceptance and overall usability in different regions of the world.

Research conducted over the last ten years has shown that HCI issues such as icon recognition, information architecture, use of imagery, use of colours, user preferences and priorities are all to some extent culture specific (Syarief et al., 2003; Marcus & Gould, 2000; Yunker, 2003). Researching Chinese and Indonesian users for example, Evers and Day (1997) looked into interface acceptance and concluded that Indonesian users placed a higher value on ease of use than functionality as opposed to Chinese users. Syarief et al. (2003) found that there are significant differences between Indonesian and American users in the way they interpret different types of messages and the speed they interpret those messages. Yunker (2003) describes a wide range of localization issues when deploying a culturally aware site (rewriting text, translating text, modifying graphics, creating new graphics, changing colours, changing layout, modifying forms, data fields, databases etc.)

Barber & Badre (1998) note that, as one might expect, red has a different meaning in different countries. It is associated with happiness in China, Anger in Japan, Death in Egypt and aristocracy in France. Their research highlighted a number of cultural patterns across sites from different countries. Finally, in *'From computer – Mediated Colonization to Culturally Aware ICT Usage and Design'* (Kurniawan & Zaphiris, 2007, p.178), Charles Ess describes how a learning tool deployed in South-Africa failed to achieve its objectives since it was designed with an individual learner in mind, whereas native South-Africans preferred to study in groups.

These examples, and many others which could not be included due to the scope of this report, paint a clear picture of how culture impacts an interaction between a user and a system. Growing awareness of

usability and then accessibility issues prompt an interest in what is starting to be known as culturability (Barber & Barde, 1998). In a global market, a culturally uninformed design is no longer an option as users may reject a product, which fails to meet local needs and expectations (Evers & Day, 2003). Sacher et al. (2001) offer the following summarizing description: *“Based on the cultural nature of products and the fact that customers approach interaction with a product with human assumptions, the introduction of an American product into the Chinese culture can be compared with the encounter of two people from different cultures and languages”*.

There are many definitions of culture. Beu et al. (2000) offer the following definition by Alexander Thomas: *“Culture is an orientation system that is universal but highly typical of a society, organization or group. This orientation system comprises specific symbols that are handed down from generation to generation within the society, organization or group. It influences the perception, thoughts and actions of all the members and therefore defines their affiliation. Culture as an orientation system provides a structure for the field of action of an individual belonging to the society, organization or group and therefore creates the requirements for the development of separate ways in which to deal with one’s surroundings”*

The separate works of Geert Hofstede into cultures dimensions and Edward T. Hall into cultural distinctions are often referred to by those who explore culturally informed design issues, as both researchers offer a general and broad theoretical basis for understanding cultural differences. After interviewing 100,000 IBM employees worldwide, Hofstede came up with the following five cultural dimensions he used to classify countries on a scale of 1 to 100: Individualism vs. collectivism, power distance, uncertainty avoidance, masculinity vs. femininity and long - vs. short-term orientation (Hofstede, 1998; Marcus & Gould, 2000; Shuper et al. 2000; Niles, 1998). All five have been looked into and incorporated to some extent in the final project recommendations, however they won't be expanded on due to the limited scope of this report.

Although Hofstede's and Hall's research had nothing to do with human-computer interaction, their work has been enthusiastically adopted by practitioners like Aaron Marcus (Marcus & Gould, 2000), who applied Hofstede's cultural dimensions to interface design and described how they result in noticeable design patterns e.g. A masculine culture is more likely to feature images of men rather than women on a website. This work is sometimes criticized (Jagne et al. 2004) for not involving more empirical work in the form of user testing and focus groups to backup the assumptions made. All this has been carefully considered when approaching the Olympics accessibility project.

As can be seen, research into culturally aware design is comprised of general cultural studies e.g. Hofstede's cultural dimensions as well as HCI centric studies which take a more direct approach by engaging with users (Beu et al. 2000; Aslan et al. 2005; Evers & Day, 1997).

The final part of this literature review focuses on the Olympics and its cultural context. As stated earlier, the Olympics is a mega-event which celebrates cultural diversity and national achievements. In *'Olympism and Nationalism: Some Preliminary Consideration'*, John Hargreaves (1992) describes how the Olympic games reinforce national identity and a sense of patriotism. He refers to Philip Goodhart and Christopher John Chataway's work titled 'war without weapons', which argues that international sport is a substitute for armed conflict. This may be an extreme view, but it does help to appreciate the strong cultural context of the Olympic games. People flock to support their nation's athletes in a competitive event that is of great significance. It is fairly straightforward to see how this might affect the design and planning of an interactive system, as users sense of cultural identity could be significantly elevated. They may be even more reluctant to accept a product that fails to meet basic cultural requirements.

3.0 ANALYSIS

From reviewing the available literature, it is clear that culture plays a crucial role in the way users interact with products on various levels. Culture shapes people's perception of the world and things they encounter. Whether it is understanding the meaning of an icon or finding certain content offensive or inappropriate. Existing cultural models and cross-cultural theories can raise awareness of cultural differences but do not offer a complete blueprint when it comes to designing a product or service for a specific population.

When reviewing HCI related research into cultural differences, it becomes clear that an empirical approach must be adopted in conjunction with established theories in order to ensure usability. In that respect, cross-cultural design follows a user-centred approach; stakeholders and context are studied and

requirements emerge. Considering stakeholders from a different culture raises the need to explore and engage with users and understand their mental models, abilities and ultimate performance when interacting with the product, as they are all literally foreign to the design team.

Designing for other cultures requires the team to potentially consider social, political, religious and other culturally related topics, which are not that prevalent when working on local projects i.e. designing for one's own culture. They may prove to be highly relevant in cross-cultural projects as they influence how users perceive the product, its functionality and ultimate usability.

In the context of the 2012 Olympics product development project, this is by the far the largest and most diverse group out of all the special needs groups being considered as part of this accessibility project. It covers all the people on the planet, who are grouped into many complex sub-groups i.e. cultures. Considering this colourful and segmented group, the following characteristics and needs were developed, which were then formulated into practical recommendations.

3.1 Characteristics

- 1) Extremely diverse group segmented into many sub-groups, which can be subdivided into smaller groups;
- 2) Degree of collective identity varies amongst sub-groups;
- 3) Familiarity with interactive products and services varies amongst sub-groups;
- 4) Sub-groups have different mental models and views of the world, which strongly affects the way members interact with each other and with interactive products;
- 5) Sub-groups differ in their use of verbal, non-verbal and written communication, hence successful communication between sub-groups can be quite a challenging task;
- 6) A sub-group is in part characterised by the language or languages used by members. They differ in writing direction, symbols, grammar, sound patterns etc.
- 7) Sub-groups differ in the value they place on the individual as opposed to the collective;
- 8) Sub-groups differ in the level of role equality found between males and females;
- 9) Sub-groups differ in the way they perceive and respond to uncertainty in life.

3.2 User needs

- 1) Translation options as the use of familiar language promotes understanding and sense of control;
- 2) May require the ability to communicate and collaborate with others as well as the ability to work and carry out tasks individually;
- 3) Meaningful visual representations and metaphors;
- 4) With some sub-groups options may need to be limited in order to avoid potential uncertainty, which in turn may lead to a negative experience;
- 5) Colour which are used to convey meaning may need to be reconsidered and tested;
- 6) Familiar environment (layout, use of colours, data formatting);

4.0 PROJECT RECOMMENDATIONS

- 1) The display should be able to properly display different character sets i.e. non-English and support Bi-directional languages such as Arabic and Hebrew (A Bi-directional language is a language which can incorporate words and sentences in a languages written in the opposite direction);
- 2) Images should not include nudity or bare skin (unless really necessary and unavoidable);
- 3) The display should support both left and right alignment of content as some languages such as Arabic and Hebrew are read from right to left;
- 4) Unless proven to have universal meaning, icons should be accompanied by text or avoided altogether, as their meaning may not be understood by everyone;
- 5) The interface should be scalable and accommodate different languages, as some languages are longer than others by up to 30% (words and sentences);
- 6) The use of colours should be considered and test to ensure that their meaning in a specific context is properly understood (red for example doesn't have the same meaning across cultures);
- 7) Low-level English should be used, avoiding unnecessary long words or any ambiguous terms and phrases;
- 8) When possible, content should be reduced and simplified, narrowing down options and avoiding too much information. This would assist people with high uncertainty avoidance levels as well as people who may interact with a language which is not their first language (English for example);
- 9) Overall, the device should be designed with high-level of customisation in mind.

5.0 SUPPORT FOR OTHER GROUPS

Several of the above mentioned recommendations would also benefit other target groups, which are of interest and concern to the project. The most notable one is the use of low-level English that would benefit users with cognitive disabilities, especially dyslexia. Children using the device would also find it more accessible if it conveys meaning in a simple manner, avoiding long words and ambiguous terms when possible. Avoiding any form of nudity would also make the content more appropriate for children, as well as people who might find them disturbing mostly due to religious beliefs.

By ensuring the interface is scalable and accommodates different languages, it would also support various font sizes, which could benefit all users, especially partially sighted, the elderly and dyslexics. These users would most probably need to customize the interface and increase the font size to make the content more readable. As some cultures prefer to avoid uncertainty in life, simplifying the device would not only benefit them but also other user groups as a simple interface and minimum number of options would reduce cognitive load.

6.0 CONCLUSIONS

Designing an inclusive device, which is accessible across cultures, is an extremely challenging task, which isn't realistic in most cases due to critical cultural differences. Careful consideration is needed in order to ensure a product is culturally acceptable. Papers and research projects referenced to in this report highlighted numerous cultural differences, which have a profound impact on the way users interact with a product, their surroundings and others. That is why localization is often the preferred approach, as it ensures the end result is tailored to the specific needs of stakeholders, taking into account relevant mental models and behavioural patterns.

Almost every aspect of human-computer interaction can be linked to cultural influence, as culture shapes people's perception of the world around them. Traditional cultural studies coupled with empirical research enable HCI practitioners to appreciate the characteristics and nature of a given culture and take them into consideration when establishing requirements. As such, culturally informed design follows a user-centred approach, and shares a similar methodology.

A number of recommendations listed in this report showed how the device in question could support a wide variety of users from different cultural backgrounds by addressing content, language and interface design issues. As the Olympic games are a large-scale competitive international event, culture plays an important role in the overall experience for spectators. The games celebrate cultural diversity, but also national achievements. In that atmosphere of heightened national sentiments and national pride, the need to address cultural needs and produce culturally informed services becomes even greater.

As mentioned, a culturally sensitive design may benefit other special needs groups, especially those that require cognitive considerations. A global solution may be simplified and very straightforward in terms of language for example. Reduced content would make it easier for most users to make choices and scan it more effectively. As in the case of other accessibility guidelines, the beneficiaries at the end are many more users who don't necessarily fit the profile of a 'user with special needs'.

In conclusion, considering cultures when designing an interactive system is a complex and highly challenging task. When designing a product for spectators of the Olympic games, it is not an option and most probably leads the design process, as cultural diversity is by far the most important characteristic of the intended user population.

7.0 REFERENCES

- Aslan, I., Xu, F., Uszkoreit, H., Krüger, A., & Steffen, J. (2005) 'COMPASS2008: Multimodal, multilingual and crosslingual interaction for mobile tourist guide applications', *Proceedings of intelligent Technologies for interactive Entertainment* (Intetain), Italy, 2005 [Online] Available at: http://www.dfki.de/lt/publications_show.php?id=746 (Accessed: 10 March 2007).
- Barber, W. & Badre, A. (1998) 'Culturability: The Merging of Culture and Usability', *The 4th Conference on the Human Factors & the Web*, June 5, 1998, New Jersey [Online] Available at: <http://zing.ncsl.nist.gov/hfweb/att4/proceedings/barber/> (Accessed: 10 March 2007).
- Beu, A., Honold, P., & Yuan, X. (2000) 'How to Build Up an Infrastructure for Intercultural Usability Engineering', *International Journal of Human-Computer Interaction*, vol. 12, no. 3&4, pp. 347-358 Lawrence Erlbaum Associates, Inc., [Online] Available at: http://www.leaonline.com/doi/pdf/10.1207/S15327590IJHC1203&4_6 (Accessed: 10 March 2007).
- Evers, V. & Day, D. (1997) 'The role of culture in interface acceptance.' In S. Howard, J. Hammond and G. Lindegaard (Ed), *Human Computer Interaction INTERACT'97*. London: Chapman and Hall. [Online] Available at: staff.science.uva.nl/~evers/pubs/INTERACT.pdf (Accessed: 10 March 2007).
- Hargreaves, J (1992) 'Olympism and Nationalism: Some Preliminary Consideration' *International Review for the Sociology of Sport*, vol. 27, no. 2, pp. 119-135 Sage Journals Online [Online] Available at: <http://irs.sagepub.com/cgi/content/abstract/27/2/119> (Accessed: 10 March 2007).
- Hofstede, G. (1998) 'Attitudes, Values and Organizational Culture: Disentangling the Concepts', *Organization Studies*, vol. 19, no. 3, pp. 477-493 Sage Journals Online [Online] Available at: <http://irs.sagepub.com/cgi/content/abstract/27/2/119> (Accessed: 10 March 2007).
- Jagne, J., Smith, S. G., Duncker, E., & Curzon, P. (2004) *Cross-cultural Interface Design Strategy*. London: Interaction Design Centre, School of Computing Science, Middlesex University (IDC-TR-2004-006) Available at: www.cs.mdx.ac.uk/research/idc/papers/IDC-TR-2004-006.pdf (Accessed: 10 March 2007).
- Kurniawan, S., & Zaphiris, P. (2007) *Advances in universal web design and evaluation – Research, trends and opportunities*. London: Idea Group Publishing
- Marcus, A., & Gould, W. E. (2000) 'Cultural Dimensions and Global Web User-Interface Design: What? So What? Now What?', *The 6th Conference on Human Factors and the Web*, 19 June, 2000, Austin, Texas [Online] Available at: <http://www.amanda.com/resources/hfweb2000/hfwebo0.marcus.html> (Accessed: 10 March 2007).
- Niles, F. S (1998) 'Individualism-Collectivism Revisited'. *Journal of Cross-Cultural Psychology*, vol. 32, No. 4, 315-341 Sage Journals Online [Online] Available at: <http://ccr.sagepub.com/cgi/content/abstract/32/4/315> (Accessed: 10 March 2007).
- Sacher, H., Tng, T., & Loudon, G. (2001) 'Beyond Translation: Approaches to Interactive Products for Chinese Consumers', *International Journal of Human-Computer Interaction*, vol.13, no. 1, pp. 41-51.
- Savidis, A., & Stephanidis, C (2004) 'Unified user interface design: designing universally accessible interactions', *Interacting with Computers*, vol. 14, pp. 243–270. [Online] Available at: delos.di.uoa.gr/downloads/publications/Unified.pdf (Accessed: 10 March 2007).
- Shuper, P. A., Sorrentino, R. M., Otsubo, Y., Hodson, G., & Walker, A. M. (2004) 'A Theory of uncertainty orientation implications for the study of individual differences within and across cultures'. *Journal of Cross-Cultural Psychology*, vol. 35, No. 4, 460-480 Sage Journals Online [Online] Available at: <http://jcc.sagepub.com/cgi/content/abstract/35/4/460> (Accessed: 10 March 2007).

Syarief, A., Giard, J.R., Detrie, T. & McBeath, M. K. (2003) 'An Initial Cross-Cultural Survey of User Perception on Web Icon Design for Travel Websites', the *6th Asian Design International Conference*, October 14-17, 2003, Ibaraki, Japan [Online] Available at: http://www.idemployee.id.tue.nl/g.w.m.rauterberg/conferences/CD_doNotOpen/ADC/final_paper/013.pdf (Accessed: 10 March 2007).

Yunker, J. (2003) *Beyond Borders – Web globalization strategies*. Berkley: New Riders Publishing