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## *Cultural Visual Interface Design* *

Kondratova, I., and Goldfarb, I.
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# Cultural Visual Interface Design

Irina Kondratova,
National Research Council Institute for Information Technology e-Business, Canada
Irina.Kondratova@nrc-cnrc.gc.ca

Ilia Goldfarb,
National Research Council Institute for Information Technology e-Business, Canada
Ilia.Goldfarb@nrc-cnrc.gc.ca

**Abstract**: In our paper a research study that focuses on the identification, harvesting and analysis of the culture-specific visual web interface design elements is discussed. A new approach to user interface development that utilises a cultural "look and feel" tool is presented. The tool is based on the analysis of the data collected by the Web crawler that allows for automated "harvesting" of visual elements of web design for several thousands of Internet domains for several countries. The cultural "look and feel" interface design tool could be used to help Web development teams quickly produce the first draft of the culturally appropriate, "look and feel" user interface design for a particular culture or country. This user interface prototyping tool would be especially useful for SMEs that want to develop e-business applications for international markets, but frequently do not have in-house internationalization/localization expertise or the budget for hiring a professional localization company.

## Introduction

We are all beginning to appreciate that the world is rapidly becoming a global marketplace. This is especially true for Web-based applications and services that could be accessed all over the globe. In this new global economy: "As a consequence of existing international WWW users and in anticipation of potential users, usability takes on an and relevant cultural context" (Barber and Badre, 1998). The importance of culturally appropriate interface design for Web-based e-business and e-government applications is emphasized by many researchers (Hornby et al, 2002; Sun, 2001; Del Galdo and Nielsen; Markus, 2002; Becker, 2002; Smith et al., 2004). Specifically, it is noted that the "culturability" (Barber and Badre, 1998), a combination of culture and usability in Web design, directly impacts on the user's perception of credibility and trustworthiness of websites (Marcus and Gould, 2000; Fogg, 2002; Jarvenpaa et al., 1999).

Fitzgerald (2004) wrote a comprehensive overview of issues related to cross-cultural web design presenting a thorough review of the models developed by researchers for managing the "subjective" aspects of cross-cultural web design. The most important of these models are *cultural dimension (n-factor)* models (Hall and Hall, 1990; Hofstede, 1991; Trompenaars, 1993; Khaslavsky, 1998), *cultural marker* models by Badre (Barber and Badre, 1998) and *cultural attractors* by Smith et al. (2004).

*Cultural dimensions* models attempt to measure and compare different cultures, using a number of cultural factors. The number of factors varies from a four-factor model by Hall (1990), to five-factor model by Hofstede (1991), a seven-factor model by Trompenaars (1993), and a nine-factor model by Khaslavsky (1998), that combines Hall's, Hofstede's and Trompenaars' models. The most extensively cited cultural dimensions model is the Hofstede's (1991) model. This cultural model contains five factors including Power distance, Uncertainty avoidance, Masculinity vs. Femininity, Individualism vs. Collectivism and Time orientation (orientation to past, present and future). A *cultural markers* model was developed by Barber and Badre (1998). "Cultural markers are interface design elements and features that are prevalent, and possibly preferred, within a particular cultural group" (Badre, 2001). In his work, Badre (2001) provides a detailed list of cultural markers corresponding to web design elements such as color, spatial organization, fonts, shapes, icons, metaphors, geography, language, flags, sounds, motion, preferences for text vs. graphics, directionality of how language is written (left vs. right), help features and navigation tools. Smith et al. (2004), in their work, define cultural design elements as "*cultural attractors*", and list a

smaller number of them: colors, color combinations, banner adverts, trust signs, use of metaphor, language cues and navigation controls. Sun (2001), in turn, in his pilot study, focuses on only four major categories of cultural markers: language, visuals, colors and page layout, and evaluates these categories for nine localized commercial websites (Adobe and IBM Lotus software).

To date, several empirical research studies were conducted in order to evaluate the influence of Hofstede's (1991) five cultural factors on human performance and user acceptance, including studies by Ford and Gelderblom (2003) and Sun (2001). Based on this model, cultural interface design guidelines were produced by Sheridan (2001) and Marcus (Marcus and Gould, 2000). Ford and Gelderblom (2003) did not find a strong correlation between human performance in groups of users differing in four of the five factors of Hofstede's model. In addition to this, work of Del Galdo and Nielsen (1996) and Fernandes (1995) has shown that it is quite difficult, if not impossible to translate cultural models, frequently designed for the business arena, into user interface designs for particular cultures. It is worth mentioning that Hofstede (1991) conducted his studies almost 20 years ago, using a large group of global IBM employees, thus limiting the results to a particular time and a particular "slice" of the local population (Jagne, 2004).

Empirical studies focused on evaluating the influence of cultural markers on user performance and acceptance of websites found some evidence of user preference for websites with cultural markers from their own cultures (Badre, 2001), improved performance for users on their local sites (Sheppard and Scholtz, 1999), or some cultural differences between websites for different countries, such as UK and Korea (Juric et al., 2003). In general, it appears that the cultural markers approach is the one that is easier to "map" directly into culturally appropriate design elements, for a website.


## Designing e-Learning Materials for Global Delivery

There is growing evidence that supports the importance of culturally appropriate design for educational courseware (McLoughlin, 1999; Pruitt-Mentle, 2003; Barron and Rickerman, 2003; Pfremmer, 2004; Seufert, 2002). This is not surprising, considering the influence of user interface design on the usability, accessibility and acceptability of software. "Usability is the measure of the quality of user's experience when interacting with a product or system" (US Department of Health and Human Services, 2004). It includes factors such as ease of learning, efficiency of use, memorability, error frequency and severity, and subjective satisfaction. Thus, applying culturability design principles in the design process of e-learning materials is an important factor to consider.

Numerous research studies confirm the major impact of culturally appropriate interface design on the accessibility of learning materials to international users. For example, McLoghlin (1999) states that adoption and accessibility of the educational resources for trans-European delivery is hindered by numerous factors, several of which relate to culture. These factors include: problems of culture and environment; teaching styles differences; problems related to different educational values; diverse language and semantics; and various technical problems related to the lack of common software and hardware standards. Evers and Day (1997) emphasize the vital role of culture in user interface acceptance. They claim that there are significant cultural differences between user acceptances of interfaces for different cultural groups. For example, in their study they found distinct differences between Chinese and Indonesian users. Other researchers (Badre, 2000; Sun, 2001; Sheppard and Scholtz, 1999) came to similar conclusions for other cultural groups.

The authors' own experience with designing Web-based materials, for an international audience (Goldfarb and Kondratova, 2002), demonstrates that cultural appropriateness plays a major role in user acceptance. The challenges encountered in the design of the logo for the International Spirit of Democracy Project illustrate this point well. The Spirit of Democracy project aimed to strengthen the commitment to democratic ideals and institutions in Russia. The objective of the project was to enhance the capacity of civic educators to develop and sustain a dynamic and vibrant program of citizenship education. This goal was met through supporting teachers in Canada and Russia by providing online resources and training that could assist them in engaging their students in a thoughtful consideration of the ideas that shape democratic societies. Due to the international nature of the Spirit of Democracy Project, it presented an opportunity for both teams to develop inter-cultural awareness and understanding. Most of the cultural issues were related to the Web site design and project logo. The process of the cross-cultural logo creation (Figure 1) is a

compelling illustration of the complex issues that can arise between two teams, working together in different countries, with different histories and cultures.



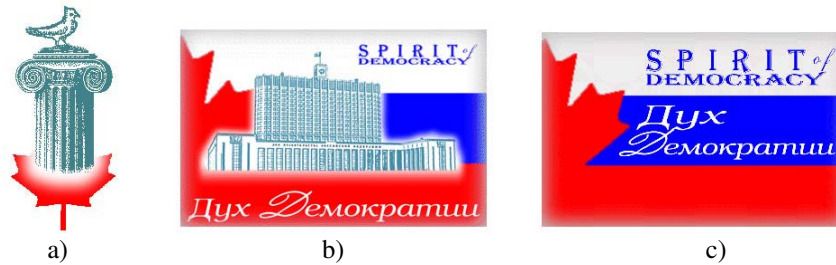<center>a)                                    b)                                    c)</center>
Figure 1. The Spirit of Democracy Project Logo creation

At the beginning of the project it was decided that both teams, Russian and Canadian, would develop their own content. The creative director for the project, a member of the Canadian team who was also a graphics designer well familiar with the Russian cultural tradition, was charged with the task of creating a logo for the entire Spirit of Democracy project. This designer created the first draft of the logo based on the common Russian interpretation of democratic symbols (Figure 1a). This draft was discussed by the Canadian team, and was rejected by the majority of the team members as not being a "true North American democratic symbol" and "having nothing to do with Russia". A second attempt produced a draft of the logo that incorporated an image of the Russian "White House" (former Russian Parliament building), as a symbol of democracy (Figure 1, b). This logo was well accepted by the Canadian team, but strongly rejected by the Russian team members. The Russian team argued that government buildings, in Russian culture, are not associated with symbols of democracy.  Finally, the designer created the third, and final, version of the project logo by removing all imagery and blending the two national flags into one image, with typography as the main graphic element (Figure 1, c). Both teams were satisfied with this logo. This example demonstrates the challenges of developing deep cross-cultural understanding, when designing Web materials for an international audience.


## Existing Cross-Cultural Theories and Practical Web Design

In spite of the wealth of information available, on the issues related to designing international user interfaces, it is not easy for Web designers and developers to acquire a deep understanding of culturally sensitive user interface design. There are a number of existing cultural models and theories, described earlier in this paper, which can be used to develop a set of broad cross-cultural guidelines, similar to ones developed by Marcus and Gould (2000). However, this approach results in a mostly theoretical model of cross-cultural design, while the practical website development approach requires effective prototyping. As noted by Smith et al. (2004), currently there is a lack of supporting tools that can facilitate the practical development process. The need for the development of global user interface, and information design tools was echoed by Ackerman (2002), of Aaron Marcus and Associates (a company that specializes in cultural interface consulting services). In his paper, Ackerman (2002) envisions the future where designers will have a set of tools: templates and libraries of images that will help them in designing culturally appropriate Web user interfaces. Smith et al. (2004) also express the need for research studies that will allow software localization companies and others to create "reusable libraries", aiding in more efficient website localization, by providing reusable "building blocks" specific to particular cultures. The following section of our paper describes a practical solution for a cultural interface design that, we believe, could potentially address the needs of web designers: a tool that could make use of reusable "building blocks" for efficient website localization. This user interface prototyping tool would be especially useful for SMEs that want to develop e-business applications for international markets, but frequently do not have in-house internationalization/localization expertise or the budget for hiring a professional localization company (Hornby et. al., 2000).


## Cross-Cultural Prototyping Tool

The idea, of the cross-cultural prototyping tool, was born as a result of previous research efforts by the authors of this paper. During the past three years, one of the authors conducted a research study that investigated what could be

done to improve the overall visual quality and learning impact of educational multimedia courseware (Goldfarb, 2004). Within this study, it was found that there is a widespread lack of visual literacy among educational courseware developers, and in particular a lack of training in the art of visual presentation among instructional designers, who often lead the courseware development teams. As a possible method for overcoming this problem, Goldfarb (2004) proposed that the development team leaders be aided by a stand-alone "look and feel" software advisor tool. This tool would assist in the creation of professional and effective presentation models that could be discussed in initial meetings with clients. During the meeting the clients would be presented with a range of professionally designed courseware interfaces that they could give feedback on, and clearly express their preferences. By properly recoding the clients' preferences and reaction to the proposed interfaces, the discussions during the meeting could be quickly translated into a successful and client-centered "look and feel" user interface design.

Based on this previous research work and in consideration of the need for culturally appropriate user interface development tools for the Web, we are currently working on a "look and feel" tool that would aid in designing culturally appropriate user interfaces for Web applications. This cultural "look and feel" tool would assist in the creation of the first draft of the cultural user interface, for a particular country/culture. The functionality of this tool could be similar to the "look and feel" interface advisor tool for the educational courseware development (Goldfarb and Kondratova, 2004), with the additional features of predefined color combinations, typography, imagery and other cultural elements that are typical for a particular region or culture. In addition to shortening the international website development cycle, this tool could also fulfill an important function of aiding in the capture of the client's preferences for the cultural web user interface. As noted by Smith et al. (2004): currently there is a "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". The proposed cross-cultural "look and feel" advisor tool could potentially fulfill this need.

## Cultural User Interface Design Steps

The cultural "look and feel" advisor tool would lead the interface designer through a set of steps, in order to define the "look and feel" of the cross-cultural interface. The first step in the process would require the user to select a geographic region. Following this, the designer would select a particular country. The next steps in this process are the general design steps: style and color selection, choosing the appropriate layout, graphics, typography, etc. For example, a designer would begin by choosing "South America" from the regions menu. Then, he/she would select Brazil from the countries menu. Following this, the designer would be presented with several choices of popular styles for this country and with a choice of predefined color combinations compatible with the country and style chosen, giving the designer the opportunity to select a preferred color combination. The choices of color combinations could be partially based on the existing international color combinations such as the one developed by Cabarga (2001), or Kobayashi Ltd. in Japan (Kobayashi, 1991). However, many of these culturally appropriate color combinations are dated and were originally designed for publishing of print materials. In order to verify the appropriateness of these color combinations for website design, it would be necessary to conduct a "cultural audit" of websites from different countries, to gather current information on the colors and color combinations used by particular cultures. The same applies to the proposed choices of typography, which could be partially based on the existing graphic design guidelines (Will-Harris, 1990) verified by the "cultural audit".

The cultural "look and feel" tool would be designed to work with the cultural "building blocks" repository that incorporates Visual Cultural User Interface Templates, visual design objects, and cultural data objects. The purpose of this repository would be to provide extra choices and support for the design team in refining the user interface design. Cultural data objects would represent cultural information other than visual design objects, such as currency and date formats, cultural preferences, audio objects, etc.

As part of our project, in order to produce the Visual Cultural User Interface Templates and populate the cultural "building blocks" repository, we are currently implementing a "cultural audit" of a large number of websites, from different countries. This is being achieved through the use of a Web crawler, designed to extract information on culture specific Web page design elements. The "harvesting" of cultural markers embedded within the HTML code or Cascading Style Sheets (CSS), such as color, font, language and layout, is automated and achieved through the utilization a Cultural Web Spider (Web crawler) that extracts cultural markers from the HTML and CSS code, from

a large number of Web pages for several country-specific domains (eg: .ca for Canada, .fr for France, .jp for Japan, etc.). Researchers will later analyze this information and statistically significant results, relating to the cultural markers in question, will serve as a basis for culture-specific Visual Cultural Interface Design templates.

However, it is not always feasible to "harvest" all culture-specific information only through the use of a Web crawler. Some cultural design elements, such as images, metaphors, icons, etc. will have to be evaluated by human evaluators, in order to extract culture-specific information and find patterns for a particular country or culture. A good example of sites where the human evaluation would be required is an example of localized IBM websites. From the time when Sun (2001) conducted his study on several localized Lotus software sites (Sun, 2001), IBM has changed the design strategy for all its localized websites, including Lotus software websites. The current localized versions are now much closer to each other in design, than what was described by Sun in 2001 (see Figures 2a, 2b and 2c for recent IBM China, IBM Germany and IBM Thailand website examples). To maintain corporate brand identity, IBM designers kept the same colors and layout for all localized websites, with the only difference being images posted on these websites. For example, IBM China website (Figure 2a) utilizes images of young happy people and bright colors, while the IBM Germany website (Figure 2b) relies on a much more conservative color combination and on images of equipment; finally, the IBM Thailand website (Figure 2c) features photographs of tropical flowers in pastel colors.


a)


b)


c)

Figure 2: IBM localized websites: a) IBM China; b) IBM Germany; c) IBM Thailand

In spite of the described difficulties with the automated harvesting of some websites, we envision that it will be possible to conduct both, automated and manual "cultural audits" on most localized and native websites. Figure 3, below, illustrates some observable differences between two websites, developed by Siemens Corporation for two different locales, with culture-specific colors and HTML attributes, that can be harvested by the Cultural Web Spider and with images, containing some cultural meaning that could be analyzed by human researchers.

In addition to data collected by a Cultural Web Spider and human evaluators within this research project, the cultural "building blocks" repository will be populated partially based on the information collected during "cultural audits" conducted by other researchers. For example, some useful information can be extracted from the study by Juric et al. (2003) on UK and Korean cultural markers; the study by Evers and Day (1997) on Chinese and Indonesian subjects; and many other similar studies of different cultural groups (Smith et al., 2001; Sun, 2001; Sheppard and Scholtz, 1999; Badre, 2000; Simon, 2001; Cyr and Trevor-Smith, 2004; etc.). It is important to note that the studies conducted by other researchers underline the importance of cultural differences in user perception of web icon design. For example, Syarief et al. (2003) found that there is significant difference between user perception and preference for explicit and implicit icons on travel websites for American and Indonesian users. Based on this, our evaluation will involve, in addition to graphics and images, icons and symbols used on popular websites for a particular country.



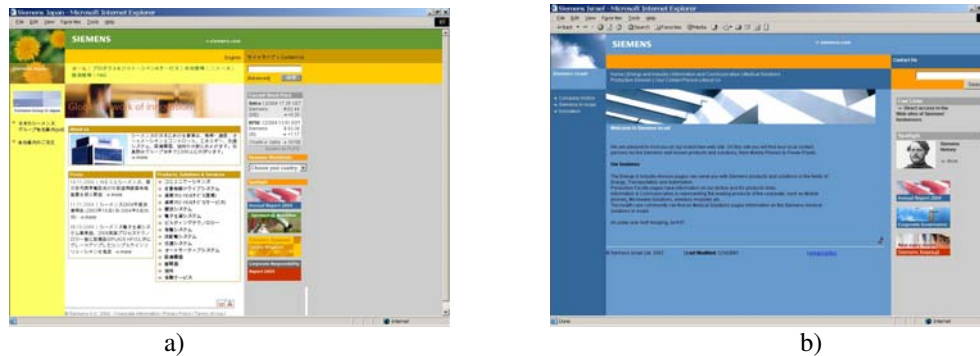a)                                                        b)

Figure 3: Localized Siemens Corporation websites: a) Siemens Japan; b) Siemens Israel.

## Conclusions

Research shows that, in the global software development market, only careful consideration of local users' needs will achieve long lasting success and client satisfaction with the cultural "look and feel" of the final product. This, in turn, impacts on the success of global e-business and e-learning enterprises. Currently there are a large number of existing cultural models for cross cultural communications. Some of them are translated in to broad guidelines for cross-cultural user interface design (Markus & Gould, 2000; Sheridan, 2001), while other guidelines are currently being developed (Smith et al., 2004). However, there is a lack of rapid prototyping tools that can assist Web developers in creating a first draft of a cultural user interface, for a particular locale, that is verifiably culturally appropriate. In addition to this, there is a lack of tools that enable productive discussions of the prototype cultural user interface with the client, who might not be familiar with the cultural models and design guidelines of the market they are requesting the software for. In view of this, the authors propose a new approach to cultural user interface development that utilizes a cultural "look and feel" prototyping tool that will be developed based on the research study utilizing semi-automated analysis of a large number of websites for a particular locale. This tool is envisioned as an advisor tool that can aid Web development teams in the quick production of the first draft of the cultural "look and feel" design. Additionally this tool could be used in meetings with clients, in order to effectively identify the client's preferences for the product interface design, while at the same time permitting only those changes requested by the client that are also culturally appropriate.

## References

Ackerman, S. (2002). Mapping user interface design to culture dimensions. Proceedings of the International Workshop on Internationalisation of Products and Systems, Austin, Texas, July 2002.

Barber, W. and Badre, A.N. (1998). Culturability: The merging of culture and usability. In 4th Conference on Human Factors and the Web: Baskin, Ridge, New Jersey.

Badre, A. (2000). The Effects of Cross Cultural Interface Design Orientation on World Wide Web User Performance. GVU Tech Reports,  http://www.cc.gatech.edu/gvu/reports/2001/

Barron, A.E. & Rickerman, C. (2003). Going Global. Designing e-Learning for an International audience, in the Proceedings of the ASTD TechKnowledge® 2003 conference, http://www1.astd.org/tk03/session_handouts/

Becker, S.A. (2002). An Exploratory study on Web usability and the internationalization of US e-businesses. *Journal of Electronic Commerce Research*, Vol. 3, No. 4: 265-278.

Cabarga, L. (2001). *The Designer's Guide to Global Color Combinations. 750 color formulas in CMYK and RGB from around the word,* HOW Design Books, an imprint of F&W Publications, Inc., Cincinnati, Ohio.

Cyr, D. and H. Trevor-Smith (2004). Localization of Web Design: An Empirical Comparison of German, Japanese, and U.S. Website Characteristics. *Journal of the American Society for Information Science and Technology*, 55(13): 1-10.

Del Galdo, E.M. and Nielsen, J. (eds.). (1996). *International User Interfaces*. John Wiley & Sons: New York, New York.

Evers, V. and Day, D. (1997). The role of Culture in Interface Acceptance. In S. Howard, J. Hammond and G. Lindegaard (Ed), *Human Computer Interaction*, *Interact'97*. Chapman and Hall, London.

Fernandes, T. (1995). *Global Interface Design*. Academic Press.

Fitzgerald, W. (2004). Models for cross cultural communications for cross-cultural website design. NRC/ERB-1108. April 6, 2004. 11 pages. NRC Publication Number: NRC 46563. http://iit-iti.nrc-cnrc.gc.ca/publications/nrc-46563_e.html.

Fogg, B.J. (2002). *Persuasive technology*. Morgan Kaufmann Publishers.

Ford, G. and Gelderblom, H. (2003). The effects of culture on performance achieved through the use of human-computer interaction. In the Proceedings of the 2003 annual research conference of the South African Institute of Computer Scientists and Information Technologists on Enablement through technology (SAICSIT 2003), (2003), South African Institute for Computer Scientists and Information Technologists, 218-230.

Goldfarb, I. (2004). The Art of Multimedia in Education, Graduate studies thesis, Faculty of Education, University of New Brunswick, Fredericton, New Brunswick, Canada, May 2004.

Goldfarb, I. and Kondratova, I. (2002). Cross-Cultural Internet Based Resource for Teaching Democracy. Proceedings of the International Conference on Computers in Education (ICCE 2002) Eds. Kinshuk, R. Lewis, K. Akahori, R. Kemp, T. Okamoto, L. Henderson, and C.H. Lee, IEEE Computer Society. December 3-6, 2002. pp. 1174-1178. NRC 44937.

Goldfarb, I., Kondratova, I. (2004). "Look and Feel" Interface Design Tool for Educational Multimedia Courseware, Proceedings of the EDMedia 2004 - World Conference on Educational Multimedia, Hypermedia and Telecommunications. Lugano, Switzerland. June 21-26, 2004. pp. 1779-1784. NRC 47153.

Hall, E. and Hall, M.R. (1990). *Understanding Cultural Differences*. Intercultural Press, Yarmouth, Maine, 1990.

Hornby, G., Goulding, P. and Poon, S. (2002). Perceptions of export barriers and cultural issues: the SME e-commerce experience. *Journal of Electronic Commerce Research*, Vol. 3, No. 4: 213-226.

Jagne, J. (2004). Integrating cultural and social factors of the shopping metaphor, in the context of indigenous users, into e-Commerce interface design, Technical Report: IDC-TR-2004-004, January 2004. Interaction Design Centre, School of Computing Science, Middlesex University. Online. http://www.cs.mdx.ac.uk/research/PhDArea/research_students/Jainaba/IDC-TR-2004-004.pdf

Jarvenpaa, S. L., Tractinsky, N., Saarinen, L., & Vitale, M. (1999). Consumer trust in an Internet store: A cross-cultural validation. *Journal of Computer Mediated Communication 5 (2)*: Online journal, http://www.ascusc.org/jcmc/vol5/issue2/jarvenpaa.html.

Juric, R., Kim, I. and Kuljis, J. (2003). Cross Cultural Web Design: An experience of developing UK and Korean Cultural markers, Proceedings of the 25th International Conference Information Technology Interfaces ITI 2003, June 16-19, 2003, Cavtat, Croatia, 309-313.

Kobayashi, S. (1991). *Color Image Scale*, Kodansha International.

Marcus, A. and Gould, E.W. (2000). Cultural dimensions and global Web user interface design: What? So what? Now what? Proceedings of the 16<sup>th</sup> Conference on Human Factors and the Web, Austin, Texas, June 19, 2000.

McLoughlin, C. (1999). Culturally inclusive learning on the web. Teaching and Learning Forum 99. Online. http://lsn.curtin.edu.au/tlf/tlf1999/mcloughlin.html.

Pfremmer, R. (2004). Content Design Considerations for Localizing E-learning Projects. *MultiLingual computing*. Online. http://www.multilingual.com.

Priutt-Mentle, D. (2003). Cultural Dimensions of Multimedia Design for Instruction. The National Educational Computing Conference, June 30, 2003, Seattle, USA.

Seufert, S. (2002). Cultural Perspectives. In Adelsgerger, H.H.; Collis, B., Pawlowski, J.M. (Eds): *Handbook of Information Technologies for Education and Training*, Berlin: Springer.

Sheridan, E.F. (2001). Cross-cultural web site design: Considerations for developing and strategies for validating locale appropriate on-line content. *MultiLingual computing*, No. 43 Volume 12 Issue 7. Online. http://www.multilingual.com.

Simon, S. J. (2001). The impact of culture and gender on web sites: An empirical study. ACM SIGMIS Database. New York: ACM. 32, (1): 18-37.

Smith, A., Dunckley, L., French, T., Minocha, S. and Chang, Y. (2004). A process model for developing usable cross-cultural websites. *Interacting with Computers*, 16 (1): 69-91.

Smith, A., French, T., Chang, Y. & McNeill, M. (2001). eCulture: A comparative study of eFinance web site usability for Chinese and British users. Designing for global markets. Conference (6th. 2001). Proceedings of the third international workshop on internationalization of products and systems. Edited by D. Day & L. Duckley. Buckinghamshire: The Open University, 87-100.

Sun, H. (2001). Building a culturally-competent corporate web site: An exploratory study of cultural markers in multilingual web design. ACM Special Interest Group for Design of Communications. Proceedings of the 19th annual international conference on Computer documentation. New York: ACM Press, 95-102

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, 6th Asian Design Conference, http://www.idemployee.id.tue.nl/g.w.m.rauterberg/ conferences/CD_doNotOpen/ADC/final_paper/013.pdf.

Trompenaars, F. (1993). *Riding the waves of culture: Understanding cultural diversity in business*. London: Nicholas Brealey.

Sheppard, C. and Scholtz, J. (1999). The Effects of Cultural Markers on Website Use, 5th Conference on Human Factors and the Web, Gaithersburg, Maryland, June 1999.

US Department of Health and Human Services. (2004). Usability.gov: Usability basics. Online. http://usability.gov/basics/index.html.

Will-Harris, D. (1990). TypeStyle: How to Choose and Use Type on a Personal Computer. Berkeley: Peachpit Press, Inc.