

## **Effectiveness of Graphical Components in Web Site E-commerce Application - A Cultural Perspective**

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### **Abstract**

This paper aims to explore cultural issues that are likely influence business information systems and their graphical components in electronic commerce applications on web sites. Studying the cultural relativism of user interface design in implementing web-based electronic commerce will provide guidelines for the global use of electronic business tools. The paper summarises recent work on implementation issues for the improvement of information system usage in a variety of system environments and web interface design issues, which should be designed to suit users on a global level. This paper attempts to illustrate requirements for graphical components and key issues in the globalized e-commerce web site development. This paper also discusses examples of effective popular customer-web site interfaces currently in use.

### **Introduction**

The problem for Information Technology professionals, human-factor researchers, business professionals and computer scientists is to develop sufficient theories and models to describe behaviour of humans who use information systems, with the aim of designing systems more effectively. Cultural factors in information systems are likely to impact on effectiveness through user interface design.

Web interface design and user issues are significant factors in the measurement of systems implementation. Web implementation is not only concerned with developers' ideas but also with consumers' choices. Information on the web relies on both user groups. In a global context, most interfaces do not promote effective usage due to use of inappropriate metaphors in a global context. Many of the icons, metaphors, shapes, colors of text and background, frame/text locations on screen, etc. employed in systems design are relevant to the culture of origin of the software. Most of these applications are directly translated into different languages at most and distributed to users internationally. In an international context, the graphic features employed in interface development makes a somewhat lesser impact in the variety of contexts it is concerned with, although it will be very clear to a minor proportion of the population as a whole. This provides an indication that consideration of human factors in the design of user interface for an international user base is an important factor in promoting effective usage of information systems. (Johnston and Johal, 1999; Corbitt and Thanasankit, 2001).

The design of web sites for effective performance is a complex and highly creative process that blends intuition, experience, and careful consideration of numerous technical issues and investigations (Nielsen, 2000; Sharma and Sharma, 2000; Sklar, 2000, Niererst, 1999).

However, their appreciation of the impact of culture is less detailed and certainly do not rank as a key issue.

There are many ways that culture can be reflected. Some forms of representations include symbols, rituals, behaviours, values and communication values (Hofstede, 1997). Culture influences certain methods of performing tasks, even common tasks in certain ways. Practices result from life long training of human and set rules and circumstances. Hence, cultural localisation deals with how differences between people from different cultures impact their behaviour in specific circumstances. History and values can also impact on user's perception. (Fernandes, 1995). E-commerce advocates have substantial claims made for the web's effectiveness as a tool in the sales process to consumers. However, little real research has addressed those factors that will make people buy, when in electronic shopping malls. Findings from cultural factors research could be beneficial for IS developers catering for a domestic consumer base, as well as for an international market, with the specific understanding of their culture and the human behaviour it produces.

We begin with the overview of web implementation issues in different system environments. Also we describe cultural issues in e-market and graphical components issues in the globalized e-commerce web site development.

This paper will focus on web usage for the users and developers who are engaged in business-to-customer e-commerce (B2C). We begin with importance of cultural issues on the web design in an e-market, then describe some current approaches to dealing with cultural issues and the attitudes of web designers in Singapore and Australia will be discussed. We describe the level of the adoption of cultural issues of 10 global IT companies in Singapore, Australia and USA.

### **Importance of cultural issues on the web design**

For the improvement of information system usage in a variety of system environments web interfaces should be designed to suit users on a global level. Guttman, Moukas and Maes (1998) suggest six stages in a model incorporating consumer behaviour: identification; product brokering; merchant brokering; negotiation; purchase and decision processes (need recognition); information search; evaluation; purchase; after purchase evaluation. O'Keefe and McEachern (1998) argue that e-commerce information systems need to be designed to support these process. Graphical features on the web are increasingly important to support information as well as interaction between consumers and business providers. Consumers are interested in information, representing style and interaction with web usage depending on the amount of graphical components. Graphical components support users' understanding and determination to purchase products from the web. In global markets, users are sensitive to interaction with product information on the web. Web designers provide information using text, colors, symbols and graphics on the web page.

Del Galdo and Nielson (1996) demonstrated that color and screen design directions have different psychological and social associations in different cultures. More importantly, different users have different concepts of screen usage. Because of the right-to left writing direction of the Arabic language, the common way to design the screen is to start reading from the top right-hand to the left-hand side (Del Galdo and Nielson, 1996). Designing screens normally needs to consider that Latin-based screen design starts from the top left-hand corner, and Chinese language can start from top right-hand to bottom left-hand or adopt

the Latin-based style. However, it is very difficult to provide localized screen designs if they are not included in the original design of the application. As a result Graphic User Interface (GUI) applications need to be considered in localized interface design with globalized information on the web.

### **Current approaches to dealing with cultural issues**

At present there are many different approaches to the problem of how to support vendor and purchaser goals using the Internet, and how to design web applications to help users from different culture backgrounds in global market to achieve their goals efficiently. Resources are currently available for web designers who wish to maximise the usability of a web site including usability guidelines (Keeker, 1997; Vorburger, 1998; Wilson, 1998). Collections of human factor references, web sites intended as a gateway to human factors resources and companies offering web-focused human factors consultancy (Davies, 2000). Also Human Computer Interaction (HCI) theories, methods, techniques and tools may be applied to the study of computer-mediated communication (CMC) in general, and web sites in particular (Forysthe et al., 1998; Kellogg and Nielson, 1997; Schneiderman, 1997).

### **Attitude of web designers in Singapore and Australia**

Del Galdo and Nielson (1996) studied the impact of the Hofstede dimensions of collectivism and individualism on web design, comparing Japan and the United States. They concluded that collectivist-type users would like to have common behavior as a group at an organizational level, and under individualism users want to have control over their surrounding environment. Hence these characteristics can be reflected in typical attitudes used in web-based e-commerce (WBEC). Singapore is one of collectivist societies as identified by Hofstede, while Australia has an individualistic culture (Hofstede, 1997). We studied 10 cases with 10 web designers/developers from 8 different companies, 5 in Singapore and 5 in Australia. These studies were conducted through a combination of face-to-face interview, email and on-line interview. Ten web designers/developers were selected in Singapore and Australia who were developing web site for companies in local (Singapore OR Australia) e-market.

We divided graphical components into characteristic issues of display colors, image representations, symbols, animations, pictures and functionality. Then we observed web designers' preferences and attitudes in creating new web page designs. These interviewed Singaporean web designers mentioned that web sites could be created depending on clients' requirements, rather than generating their own ideas. Also clients are required to make more use of new applications for web graphics. In contrast, Australian web designers emphasized that web design is a collaborative processes between clients and designers. Clients are a part of the web design team in Australia. New applications are used only when it integrates into the design and they feel comfortable using the concept.

Figure 1 shows some of the key differences among web developers in Australia and Singapore. Web developers in Singapore mentioned that they have to provide information with images, animations and company logo from companies' requirements. Also the comment about the customer's concerns on the web was not counted in Singapore. Singaporeans put importance in using signs and symbols whilst Australians do not perceive signs and symbols to convey meaning. Singaporeans believe in building relationship to ensure trust and success, whilst Australians believe in doing things to build trust.

Characteristic	Web developers' attitudes	
	Singapore (Singaporean)	Australia (Australian)
Use of display colors	Use particular color scheme (depends on companies preference)	No color preference from companies
Image represented	Company logo is important	Company prestige is more important than image
Use of symbols	No particular scheme	No particular scheme
Use of animations	Important part	Less important
Use of pictures	Heavily used	Mainly used text
Functionality of the web site	Customers are not main consideration (Display only)	Customer reactions are major influence on design

**Figure 1:** Some of the key differences among web developers in Australia and Singapore

Lim and Turk (1999) noted selected key aspects of user interface preferences of Australian subjects who favour interface features. Thirty eight percent of Australian users preferred GUI interface design and 62 percent of Australians preferred use of many different colors for web interface design. Also 81 percent of Australians preferred text-based interfaces (Lim and Turks, 1999). This study also found that Australian developers preferred to use text rather than image to provide information on the web. On the contrary Singaporean developers preferred to use more graphic images rather than text information on the web.

### **Adoption of cultural issues**

Day (1998), and Ess and Sudweeks (1998) emphasize that cultural aspects impact on the globalization of computer-mediated communication (CMC) in web-based e-commerce. In light of the conclusions derived from the previous section on case studies, we observed ten different web sites of IT companies in order to determine their approach to their web site design.

We investigated and observed 10 IT company web sites included Apple, Compaq, Dell, Gateway, IBM, Intel, Microsoft, Oracle, SAP and SUN based in USA, Australia and Singapore. All of these companies provide the same graphical design as home based design for local users in countries other than USA (Singapore and Australia). It indicates that international market providers (mainly USA based) use the same pattern of colors, symbols, and images on the web in different countries. Apparently there were no different design approaches for different countries. Yeo (1996) recommended that applications could be adopted for local users rather than internationalised to produce a Cultural User Interface (CUI):

*“... takes advantage of the shared or common knowledge of a culture which could be defined by country boundaries, language, cultural conventions, race, shared activities or workplace”*

Turk and Trees (1999) also demonstrated that there is increasing attention to investigating ways to develop designs suitable for different culture backgrounds and indigenous people. According to Yeo (1996), Turk and Trees (1999) the global information systems on the web should be developed in such way as to localize information and design for different culture background users.

## **Conclusion**

Although the cultural background of consumers is very important for interface design, current design practice takes minor account of cultural issues. Consumers' expectations are not taken into consideration in designing the functionality of web sites in Singapore. Singaporean designers emphasized that the graphics (pictures and animations) are important components and hence are heavily used to attract local customers. On the contrary, Australian web designers were less sensitive to the use of graphics on the web. However they preferred creating an image of the company on the web rather than using company's logo to reiterate company's image. Apparently Australian web designers are more customer-oriented in web design, in comparison to Singaporean web designers. The web sites of leading IT companies did not have their interface to account for different user cultures. The web designers create graphic components on web sites lead to unique conventions leading to evolution of a new culture in expression of ideas on the web based e-market (WBEM).

Future e-commerce technologies will definitely introduce more attractive and convenient tools for the customers. From this research we found that graphical images are becoming more important in conveying meaning to a concept on the web sites rather than text. Moreover, graphical components are better suited to be used in certain ways to improve WBEC. Not surprisingly graphic images can also be used to attract customers and increase company's presence in the global e-market.

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