Cultural Issues and Their Relevance in Designing Usable Websites

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Abstract— **Cultural characteristics of users play a significant role in their interactions and understanding of web based systems. Hence consideration of cultural issues in the design of a web based system can improve the usability of such a system. The relation between culture and the internet is symbiotic, that is, experience obtained from using the internet (with its rich cultural diversity) can also have an influence on the local culture. This makes culture a moving target. However to-date, not much research has been done about what cultural issues influence the usability of websites and the level of influence. This paper examines theoretically the cultural issues that influence web design/usability and the significance of this influence to the general usability of a website and also establish how culture can be utilized to develop more usable websites. Thus the main contribution of this study is to identify what characterizes usable websites with reference to cultural needs of the user, specific web features applicable to cultural dimension that can enhance cultural understanding and help web designers to customize the web sites to specific cultures.**

Keywords: Human Computer Interaction (HCI), Web Usability, Culture/User Centered Design, Cultural dimensions.

1 INTRODUCTION

As the World Wide Web spreads across countries, it has become increasingly important for designers to respect and understand cultural differences in how people communicate and use the Internet. This knowledge is particularly crucial for people in international business, technology professions, and other work areas that require people from different cultures to interact online (Sapienza, 2008).

According to the International Telecommunications Union as of December 31, 2009,the number of users interacting with internet increased 399.3 percent since year 2000. A survey by Forrester Research indicated that North American consumers alone spent $172 billion shopping online in 2005, up from $38.8 billion in 2000. By 2010, consumers are expected to spend $329 billion each year online.

With the number of online consumers on the Web steadily increasing, there is a need to seek a better understanding of user cultural preferences in the design elements. The results of an on-line experiment that exposed American and Chinese users to sites created by both Chinese and American designers indicated that users perform information-seeking tasks faster when using web content created by designers from their own cultures (Faiola and Matei, 2005).

Evers and Day (1997) In examining user satisfaction, found that 67.9% of a user interface would be satisfied using an interface with technology adapted to their culture.

Web site usability is to a large extent affected by culture of the user, or there is a relationship between culture and usability, or "culturability" as it is known or termed by Barber and Badre (2001). They argue that the success of an interface is achievable when the user interface design reflects the cultural characteristics of the target audience. Ease of use with cultural acceptability has become the pre-eminent requirement of designing software and other computer applications. To meet this necessity, "culturability" has emerged as a serious field of research. According to Nantel and Glaser (2008), a "culturally adapted website results in greater ease of navigation and a more positive attitude towards the site". Thus indicating ease of use.

Presently, few information systems such as application software with graphical user interfaces, government websites, online shopping sites and even corporate websites satisfy usability and cultural criteria, resulting in a lot of frustration among users, the reason for this is that the design of these information systems are technology-entered, in which the cultural needs of the users have not been taken into consideration during the development process.

Interacting with a website is a form of communication. For a website to achieve a successful communication with the users, two variables need to be considered, the language in which it is coded and the context in which the information was embedded. If these are not shared by the system designer and the users, their meaning will differ thus not achieving efficient communication (Mantovani, 2001). While language can be easily determined, context identification can be a complex task. Language does not mention what is commonly known. So at least culture provides extra context, that what is commonly known by people sharing that culture. Furthermore, we communicate by using symbols. But symbols are very culture dependent. Finally, how to go about this has a cultural component. The look and feel of a website is derived from the common strategies to solve a problem. A way to do this is based on culture, because it allows clustering people in groups that share common characteristics and traits.

This paper discusses cultural that influence web usability and how culture can be utilized to develop more usable websites. It will explore the meaning of usability, culture and investigate in which ways objective and subjective cultural issues affects the usability and design of websites.

"No longer can issues of culture and usability remain separate in design for the World Wide Web. Usability must be re-defined in terms of a cultural context, as what is user-friendly for one culture can be vastly different for another culture, and usability must therefore take on a cultural context",[1]

Wendy Barber and Albert Badre, Graphics, Visualization & Usability Centre/ Georgia Institute of Technology, Atlanta.

[1]The merging of culture and usability in website design or culturability as termed by Barber and Badre (2001), challenges the idea of usability as being culturally neutral by claiming that cultural values such as thought patterns and customs are expected to directly affect the way a user interact or affect the usability of a website.

1.1 Objectives of this study

The major goal of this paper are as follows:
- To find out cultural issues that influences Web usability
- To establish how websites can be adapted to meet cultural needs of users
- To establish how culture can be utilized to develop more usable website.

2 Web Usability and Culture

2.1 Website Usability

There are many definitions of usability proposed by various individuals, but there is no common definition of usability, which is generally accepted within the HCI community.

Precce et al (1994) defined usability as "a measure of the ease with which a system can be learned or used, its safety, effectiveness and efficiency, and attitude of its users towards it".

Nielsen(1993) defined the usability of a computer system in terms of the following attributes: learnability, efficiency, memorability, errors, and satisfaction. On the other hand, ISO 9241-11 defines usability as "the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use". From the above definitions, it can be concluded that usability of a website is generally concerned with making website interfaces that are easy to use or user friendly.

2.2 Culture

There is a wide range of culture definitions that vary throughout authors and time.

As Kluckhohn (1962) states, culture is a set of definitions of reality, including language, values and rules that set the limits for behavior, held in common by people who share a distinctive way of life.

Evers and Day (1997) affirms that culture shapes the way people behave, view the world, communicate and think. It is formed by historical experiences and values, traditions and surroundings.

Hall(1959) sustains that culture stands for a frame of reference developed by a group of people used to understand each other. For him, key issues for developing this frame are ways of life, behavioral patterns, attitudes and material objects.

When a group of people, no matter its scale, start sharing common ways of thinking, feeling and living, culture emerges (Keiichi Sato & Kuosiang Chen 2008).

The word culture also come from the Latin word "colere" (to inhabit, cultivate). The original meaning was used in the biological sciences (for example, a bacterial culture). In the mid-to-late 19th century, the term came to be applied to the social development of humans (Sapienza, 2008).

Ernest Gellner (1997), gave the most commonly accepted meaning who calls culture "the socially transmitted and sometimes transformed bank of acquired traits". Although culture is a social phenomenon, biological characteristics are often connected to it. For example, we see people of a particular gender, age, skin color, or body type (height, weight, etc) and we assume they must belong to a particular culture (Sapienza, 2008).

2.2 Classification of Culture

Culture can be broadly categorized into objective and subjective culture as shown in figure 1. Objective culture is the visible, easy to examine and tangible, aspect of culture represented in terms of text orientation, metaphor, date and number formats, page layout, color and language while Subjective culture is "the psychological feature of a culture, including assumptions, beliefs, values, and pattern of thinking"(Hoft, 1996).
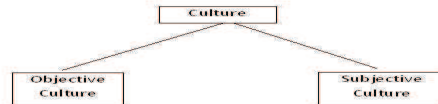

Fig 1: Classification of Culture

2.2 Cultural Models

Cultural models consist of cultural variables, which can focus on easy-to-research objectives like political and economic contexts, reading directions and formats for dates and numbers. Cultural variables can also focus on subjective information, like value-systems and behavioral patterns.

Hofstede	Trompenaars
Power Distance	Universalism vs. Particularism
Masculinity vs. Femininity	Neutral or emotional
Individualism vs. Collectivism	Individualism vs. Collectivism
Uncertainty Avoidance	Specific vs. Diffuse
Time Orientation	Achievement vs. Ascription
	Time
	Environment
Victor	**Hall**
Language	Speed of Messages
Environment and Technology	Context
Social Organisation	Space
Contexting	Time
Authority Conception	Information Flow
Nonverbal Behaviour	Action Chains
Temporal Conception	

Table 1. Cultural dimensions and their definitions

Hoft (1996) identified four models of culture developed by Hofstede, Hall, Trompenaars and Victor.

Hofstede's model: This model is about patterns of thinking, feeling, and acting that form a culture's mental model.

Edward T. Hall: Dealt with the purpose of determining what releases the right responses for effective communication.

Fons Trompenaar's model: Developed a model of culture with the purpose of determining the way in which a group of people solve problems.

David A. Victor's model: This is about an aspects of culture that affects communication in a business setting.

These models identified a number of cultural dimensions that are used to illustrate their various models of culture. Due to space limitation and because some of the dimensions are common in some of the models, a description of a few of the cultural dimensions and their definitions are as shown in Table1 above, and the cultural models and their dimensions are as shown in table 2.

Table2. Cultural models and their dimensions (adapted from Hoft, 1996)

Culture Dimension	Definition
Power-distance PD (Hofstede)	The extent to which people accept unequal power distribution in a society.
Collectivism/ Individualism IC (Hofstede)	the extent to which people prioritize or weigh their individuality versus their willingness to submit to the goals of the group.
Feminine/Masculine MASFEM (Hofstede)	the extent to which a culture exhibits traditionally masculine or feminine value.
Uncertainty Avoidance UA (Hofstede, Trompenaars)	The extent to which a society willingly embraces or avoids the unknown.
Time Orientation (Hofstede, Trompenaars Hall,Victor)	Present in all four models: is about peoples concern for past, present and future., stands for the fostering of virtues oriented towards future rewards, in particular, perseverance and thrift.
Universalism-Particularism (Trompenaars)	Degree to which people in a country compare generalist rules about what is right with more situation-specific relationship obligations and unique circumstances
Neutral vs. Emotional Relationship Orientations (Trompenaars)	Degree to which people in a country compare 'objective' and 'detached' interactions with interactions where emotions is more readily expressed.
Achievement vs. Ascription (Trompenaars)	Degree to which people in a country compare cultural groups which make their judgments of others on actual individual accomplishments (achievement oriented societies) with those where a person is ascribed status on grounds of birth, group membership or similar criteria.
Specific vs. Diffuse Orientations (Trompenaars)	Degree to which people in a country have been involved in a business relationships with in which private and work encounters are demarcated and 'segregated-out'
Context (Hall, Victor)	Context refers to the amount of information given in a message. A high context is one in which much is said and information is detailed. And in a low context, little is said and the information is distorted.

This paper will adopt the five dimensions of culture from hofstede for the investigation of subjective cultural aspect of this study.

Hofstede's dimensions of culture are often quoted in relation to cultural usability. It has gained wide acceptance among anthropologists, and has been proposed as a framework for cross-cultural HCI design (Vöhringer-Kuhnt, 2001). Hofstede viewed culture as 'programming of the mind' in the sense that certain reactions were more likely in certain cultures than in other ones, based on differences between basic values of the members of different cultures. Hofstede proposed that all cultures could be defined through the following dimensions: Power distance (PD), Individualism vs. Collectivism IC, Masculinity vs. Femininity (MASFEM), Uncertainty avoidance (UA) and Longterm orientation (LTO) vs. Short term Orientation. (See table 1 above for explanation of the dimensions).

3   Related research

Marcus and Gould (2001) in their paper on cultural dimensions and global web design discussed the impact of culture on websites design. They examined how Hofstede's five dimensions of culture might affect user interface design. By drawing from the Internet sites of several corporate and non-corporate entities of differing nationalities (e.g., Britain, Belgium, Malaysia, the Netherlands, Costa Rica, and Germany), the authors concluded that societal levels of power distance, individualism, masculinity, uncertainty avoidance, and long-term orientation are reflected in several aspects of user-interface and web design.

Barber and Badre (2001) posited the existence of prevailing interface design elements and Web site features within a given culture, called cultural markers. These are interface design elements and features such as color preference, fonts, shapes, icons, metaphors, language, flags, sounds, motion, preferences for text vs. Graphics, directionality of how language is written, help features, and navigation tools that are prevalent, and possibly preferred, within a particular cultural group. Such markers signify a cultural affiliation. They examined the cultural markers of web sites from different nations and cultures, by grouping several web

sites according to their language, nation and genre and manually inspecting each cluster looking for recurrent design preferences. They concluded that web sites that contain the cultural markers of their target audience are considered more acceptable by users of their underlying culture.

Evers and Day (1997) in a more comprehensive study of usability and culture found culture to be an important factor regarding the perceptions of efficiency, effectiveness, satisfaction, and user behavior when using a software application. They discovered that there is a difference between Chinese and Indonesian in terms of user interface acceptance. They concluded that culture is likely to influence many elements affecting the usability of a product.

Nantel and Glaser (2008) demonstrated that perceived usability of a website increased when the website was originally conceived in the native language of the user. Translation, even of excellent quality, created a cultural distance which impacted users' evaluation of site usability. A similar result from Information Retrieval is that documents are best searched in the language in which they were written. While evaluating the quality of an offer on the web, however, language had little or no impact on the evaluation.

Vohringer-Kuhnt (2001) investigated cultural influences on the usability of globally used software products. The survey was conducted online by way of the internet. The overall results revealed differences in the attitude towards usability across members of different national groups. The study concluded that only Hofstede's Individualism/Collectivism was significantly connected to the attitude towards product usability. But further research is needed to deepen the value of Hofstede's cultural specific variables to cultural design and evaluation of software and web applications.

Andy Smith et al (2003) posited the concept of cultural attractors to define the interface design elements of a website that reflects the sign and their meanings to match the expectations of a local culture. This cultural attractors are colours, banner adverts, trust signs, use of metaphor, 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.

Shen et al (2006) suggested Culture centered design CCD, in which the design process should be concentrated around the target user and his/her specific cultural conditions. The design process needs to be characterized by iterative analyses. These analyses checked design choices in each phase in the design process on cultural appropriateness, relevance, semiotics, functionality and usability. They also introduced the idea of a 'cultural filter' derived from the book 'Psychoanalysis and Zen Buddhism' by Erich Fromm (German philosopher 1900–1980).

The main gaps that were found in this few previous researches are:

- Most of the studies could not conclude whether their various dimension of culture applied for their research has an influence on overall usability of a website or an interface.
- The result of their numerous researches on culture and web design did not recommend how culture can be utilized to develop usable website.

The next section discusses cultural issues that influence Web usability and how understanding the culture of a given community can be utilized to develop more usable websites.

4   Cultural Issues in Web Design and Usability

Several frameworks (Barber & Badre, 2001), (Sapienza, 2008), (Tanveer et al, 2009),(Smith et al 2003) to mention a few exists to show that there is a linkage between culture and web design/usability.

Over the last few years, more and more localized versions of websites have been developed in order to address target national or cultural user groups. Culture is a huge consideration when designing websites. Not everybody reads or understands information the same way, and culture especially plays a very big role in how we view websites. Even the most basic understanding of this principle is needed before designing sites that may be viewed by people from different cultures. When designing a website the culture of the target audience is a major factor in the design process.

4.1   Influence of Objective Culture on Web Design and Usability

Objective culture is the visible, easy to examine and tangible, aspect of culture represented in terms of text orientation, metaphor, date and number formats, page layout, color and language (Hoft, 1996).

The impact of objective cultural design elements such as languages, colors, metaphor, and page layout will be discussed next as it is not possible to discuss all aspect of objective cultural elements in the present study.

4.1.1 Color

An objective cultural factor that should be considered when designing a website is the use of color. Color is connected to feelings of people and it has different meanings in different cultures. "Colors also have important meanings in web design. Color could be used for background, frame, images, hyperlink, etc. Website designers need to take into consideration the color preferences and the meaning of various colors for the targeted audience. Barber and Badre (2001) gave an example of the color-culture of different countries. For example, the red color means different things to different people: for the Chinese it means happiness; for the Japanese, anger/danger; for Egyptians, death; and for Americans, danger/stop. The use of color can also be associated with religion. For example the Judeo-Christian tradition is associated with red, blue, white, and gold; Buddhism with saffron yellow and Islam with green. Therefore, when designing a large-scale website, it would be very helpful to conduct a survey and an analysis of the color preferences of the target audience and the meanings of color for the market before designing the website.

4.1.2 Metaphor

One of the most important aspects in designing a culturally relevant interface is the accurate and deliberate use of the metaphor. The metaphor is a powerful tool for translating the technical happenings that take place beyond the interface into a concept that makes sense to the average user, appearing on the interface itself. The majority of software are developed

in, or contracted by the USA, and its interfaces have therefore been based primarily on American metaphors (Shen et al. 2006). Often a metaphor applied out of context is open to misinterpretation. For example, the 'my computer' icon of MS Windows has proved to have lead to much confusion as it suggests ownership which often is not the case. In some cultures the idea of something that can be retrieved from the trash bin after it has been deleted seems illogical and degrading (Shen et al. 2006). Successful interface metaphors should be developed or adapted through cultural requirements by, or with reference to, representatives of the culture for which they are intended (Shen et al. 2006).

4.1.3 Language

The most distinctive cultural symbol is language and language indicates the speech used by a particular group of people including dialect, syntax, grammar and letterform (Tong and Robertson, 2008). Language is the building block from which users gain information from a website (Cyr and Trevor-Smith, 2003). Even though most websites users can speak English, they are almost always more comfortable in their native languages. In a study conducted by Marlow et al, 2007) on the multilingual needs of website visitors to the Tate Online, the web site for Britain's Tate art galleries, they found out that many individuals would appreciate having more content available in their own language, either due to necessity or out of

preference. However, the best means of providing this content depends on a variety of factors, including the pragmatic consideration of resources available for translation. While some countries, especially Asian or developing countries, like to display their English speaking abilities, other countries prefer to maintain their own native language for reasons of national pride. This is especially true in some European countries. Due to the fact that English is one of the most popular languages all over the world, it is advisable to design a site in English and then incorporate a translator to translate to the local language of the intended users.

4.1.4 Page Layout

This is the physical arrangement of text elements and graphical elements on a web page, this also vary from one culture to another. it can therefore be described as a cultural component. Also the flow direction of a page either horizontally or vertically varies from one culture to another.

A good design layout will enhanced a better understanding and hence usability of a website. For example, France has a centered orientation, suggesting that features on a French site would most likely be centered on the page (Cyr and Trevor-Smith, 2003). While in the Islamic countries, page layout will flow from top to bottom. The design of a website must take into account text flow which also varies from one culture to another. The direction in which text in some languages is written can be unidirectional, such as English, or bi-directional such as Arabic. Also, some languages are read from left to right, others right to left, this must also be taken into consideration when designing a web page layout.

4.2 Influence of Subjective Culture on Web Design and Usability

Hoft (1996) defined subjective culture as "the psychological feature of a culture, including assumptions, beliefs, values, and pattern of thinking". Its influence on usability is a contentious issue in the field of Human Computer Interaction HCI as some members of the discipline regard the lack of accommodation of subjective culture into the design of interfaces as an important cause for decrease in usability (Ford, 2005). Most researches done on the influence of subjective culture on usability have been inconclusive or without adequate result. The influence of subjective culture aspect of this study will be based on Hofstede's framework as applied by Marcus and Gould (2001) to web and user interface design. (Marcus & Gould, 2001) applied Hofstede's cultural dimensions to web and user interface design. They mentioned each of Hofstede's five cultural dimensions and the aspects of user interface design that can be influenced by that particular dimension resulting in specific design recommendations that can influence usability for each dimension. Due to space limitation see

Marcus & Gould (2001). The influence of each Hofstede's cultural dimension on web design and usability are as follows:

4.2.1 Power Distance

Marcus and Gould (2001) uncovered that members of high Power Distance (PD) cultures such as Chinese, generally prefer a clear hierarchical navigational structure and generally exhibit a strong preference for symmetry in web design. Marcus and Gould's study also found that on a Malaysian university Web site, for example, they point out evidence of high power distance. This characteristic is displayed on the Web site through a concentration on the power structure of the university: the prominent area of the site devoted to the university's seal, graphics of items such as faculty, buildings, and administration. compared to a Web site of a university in the Netherlands, a low power distance culture. This site displayed pictures of students rather than leaders, and reveals a stronger use of asymmetrical layout meaning that there is a less-structured power hierarchy.

4.2.2 Individualism/Collectivism

According to Sudhair et al(2007), in an individualist societies such as the US and Australia, "I consciousness" prevails and the individual tends to have fairly weak ties with others, they will place great salience on website personalization but in a collectivist societies such as Taiwan and Pakistan, people regard themselves as part of a larger group such as the family or clan and would be more favorably disposed towards websites that make references to the appropriate in-groups or slogan to emphasis a national agenda.

4.2.3 Masculinity/Feminism

Masculine societies such as Japan and Austria tend to be hero worshippers whereas feminine societies such as Sweden and the Netherlands tend to sympathize with the underdogs (Sudhair et al, 2007), therefore web document in a masculine society should contain references to such characteristics as success, winning, strength, and assertiveness whereas in a feminine

society web document will contain information on charitable causes and family oriented images.

4.2.4 Uncertainty Avoidance

Low UA societies like Denmark and Sweden conditions their members to handle uncertainty and ambiguity with relative ease and little discomfort Sudhair et al(2007), while members of high UA cultures (such as New Zealanders) will like web site navigation that will prevent the user from being lost (Marcus and Gould, 2001), this can also be seen in a high uncertainty avoidance society like Japan and Belgium where they attempt to create as much certainty as possible in the day to day lives of people through the imposition of procedures, rules and structure. Therefore web document in a high UA society will contain references to precise and detailed information, references to relevant rules and regulations.

4.2.5 Time Orientation

Long Time Orientation is about being thrifty and sparing with resources, and perseverance towards slow result. Short time orientation societies lives in the present with little or no concern for tomorrow. Long Time Orientation (LTO) societies such as China and Hong Kong tend to save more and exhibit more patience in reaping the results of their actions whereas Short Time Orientation (STO) societies like most West African nation and Norway want to maximize present rewards and are relatively less prone to saving or anticipating long term rewards (Sudhairet al, 2007). Web document in LTO culture will emphasize perseverance, future orientation, resources for conversation, respect for the demands of virtue, and de-emphasize truth and falsity as a strictly binary, black-and-white relationship (Zahedi et al, 2001). While web document from STO societies like Nigeria will show clean functional design aimed at achieving goals quickly.

5 Recommendations for designing to meet cultural needs

1. Understand the local culture

Study the local culture specific demands in a website for the target culture.

- Identify culturally specific metaphors, visual and representational aspects of local culture.

2. Language   factor
   Even though most websites users can speak English, they are almost always more comfortable in their native languages. It is advisable to design a site in English and then incorporate a translator to translate to the local language of the intended users.

3. Basic Web Design Elements (visual)
   Simple symbols or icons that are commonly understood in the U.S. may confuse, or even insult, visitors from other regions. Icons and other visual elements are very specific to each country, Thus when using this visual elements on the web pages, country-specific understanding is needed. An example is the mail box with raised flag conveying "email." Many local users may not recognize this little mailbox; an envelope would serve to convey the same message to them. It is possible for symbols to have "unintended" or "hidden" meanings in other cultures as well.

4. Contact   Information
   Names, postal addresses, phone numbers, fax numbers, etc are important pieces of contact information. Website forms need to accommodate longer names, addresses, phone number, fax numbers and zip codes to satisfy the local needs of website users.

5. Currency
   If a website offers any product or service for purchase, currency issues may arise with local visitors. If you were targeting a product to a specific audience, it will be a good practice to give a rough estimate of the price in their local currency.

6. Dates,   Time,   and   Place
   Dates are often critical pieces of information to be communicated on-line and the American convention of using month-day-year is not universally accepted, as day-month-year is used in many parts of the world. Time can be referenced by the 24 hour time system internationally, so that 8:52 p.m. becomes a standardized 20:52. Time references, such as the hours of office operations, should be accompanied by the appropriate time zone or reference to Greenwich Mean Time.

5 CONCLUSION

Cultural characteristics of website users is a key factor to determining the user acceptance of a website, current design practice take little account of cultural issues during the design process. It is evident from the views presented in this paper that culture has a significant impact on how the user perceives a website.

Incorporation of cultural factors in web design process is critical in achieving the high quality of human-website interaction between users and the websites. That is why a better approach to designing website should involve taking into consideration the cultural and usability needs of the users.

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