

Localization of Web Design: An Investigation of Culturally Preferred Web Attributes in Taiwan and the UK

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Abstract. Cultural diversity makes it unrealistic for designers to rely on intuition or personal experience to develop web interface design under the context of globalization, it is important to explore the cultural requirements and preferences of a target culture if a company wants to develop a website which can appropriately map that target culture. Although there is increased research related to culturally preferred design attributes, there are few studies that systematically examined such preferences across cultures. Therefore, the aim of this paper is to investigate culturally preferred design characteristics in Taiwan and the UK, and the local website audits were conducted to identify the cultural preferences of each culture. Significant differences of culturally preferred design attributes were found across both cultures. Results from this study can contribute to help web developers and designers to develop the design for websites as culturally appropriate.

Keywords: globalization, local website audits.

1 Introduction

In the context of globalization, Hofstede [12] suggests that web developers can accommodate the diverse cultural market, “Localization, a strategy that specifically addresses cultural differences, is an alternative to globalization.” Marcus [16] also echoes that companies that want to do international business on the web should take a country’s culture into consideration in their web communication, content and tools. Many researchers apply current cultural models to develop their studies, but web designers and developers should be careful that the established cultural model might be too stereotypical and not really fit the target culture market. As Del Galdo [7] suggest, web designers should get directly involved in the target culture.

In Sun’s study [21], she interviewed with target culture users about their experiences how culturally preferred design characteristics such as visuals, language and colors affect web usability and stated that cultures continue to develop and interact,

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and they are not ontologically objective. It reminds web developers and designers to maintain practical observation of the target culture users, because culture is constantly changing, particularly in the internet era.

Therefore, it is important to explore the cultural preferences for a target culture if a company wants to develop a website which can appropriately map that target culture. The aim of this paper is to investigate the culturally preferred design elements in Taiwan and the UK, to identify the cultural preferences of web design attributes in the two cultures.

2 Globalization and Localization

Baumgartner [2] defines globalization as “an umbrella term that refers to all the issues involved in designing or modifying products for audiences worldwide...we can also say that globalization combines all aspects of internationalization and localization.”

Internationalization refers to the process of creating a base design that can be modified for audiences from different countries. According to Sun’s definition [21], internationalization refers to the process of designing an application which can be adapted to different markets worldwide without engineering changes.

Localization refers to the process of adapting an internationalized product to make it usable in a particular region, culture, or market. True localization not only considers graphics, colors, symbols, terminology, date/time/currency formats and many other technical aspects of a product, but also takes into account language, customs, culture and other characteristics of the target culture market. Based on Gribbons’s study [10], usually two sub-levels need to be carried out in the localization process. These sub-levels comprise a surface level, the modification of the attributes of the web artefact including translation, dates, punctuation, measurements, currency, and so on, to reflect the conventions and needs of the target users, and a cultural level, the modification of the visual representation, colors, structure, layout, functionality, and communication patterns to accommodate the target users. This research focuses on the cultural level.

3 Culture, Web Attributes, and Related Hypotheses

3.1 Hall and Halls’ High and Low Context Culture

Hall & Hall [11] classified two kinds of contexting, “high context” and “low context”. “High context or low context refers to the amount of information that is in a given communication as a function of the context in which it occurs”. According to Hall and Hall [11], Kaplan [15], Chen and Starosta [4], and Choe [5], high context cultures tend to be implicit, indirect, ambiguous, harmony seeking, polychronic cultures, and have specific thought patterns, whilst low context culture have the opposite characteristics. The attributes that are related to high context and low context cultures are introduced as follows.

1. Polychronic & Monochronic Time Perception: This refers to the perception of time varying across cultures. People from high context culture countries tend to be polychronic in time perception and think that everything will go smoothly when the time comes; people from low context culture countries tend to be monochronic in time perception and believe in executing a task based on schedules.

2. Thought pattern: A non-linear way is used to explore something to uncover the truth. Rationality is not necessarily confined to countries with a high context culture. People from a high context culture tend to use indirect strategies in their communication, usually not state the subject directly. People from a low context culture have a strong belief that there is one objective truth which can be reached by linear exploration, so they want to meet their aims directly by applying logical and rational thinking.

3. Communication pattern: People from high context cultures countries are inclined to have more confidence in their non-verbal communication, and a high number of gestures, body language, silence, and symbolic behavior are preferred and expected by them. People from low context cultures, such as Germany and the UK, are inclined to express meaning depending on content and oral language.

4. Indirectness: People from a high context culture tend to use ambiguous, indirect and harmonious ways to communicate. People from low context cultures tend to express themselves in a more direct way to make sure that the listener understands completely.

3.2 Hofstede's Cultural Dimension

Based on Hofstede's (2005) study, there are five dimensions in his cultural theories. The details of each dimension are presented as follows.

Individualism and Collectivism: This refers to the extent to which individuals incorporate within a group. Collectivist cultures (e.g., Taiwan and China) tend to prioritize group welfare over individual welfare. Individualistic cultures (i.e. USA, Australia) are inclined towards loose ties, where everyone is expected to look after him/herself.

Masculinity and Femininity; This refers to gender roles within a culture. Countries with Masculine cultures (for example, Japan) tend to present assertive, competitive qualities. On the contrary, countries with feminine cultures (e.g., the Scandinavian countries) tend to blur gender distinction and present tender roles.

Uncertainty Avoidance: This refers to the degree to which people are comfortable with uncertain conditions. Cultures with high uncertainty avoidance (e.g., Japan and China) tend to prefer rules and reject change since uncertainty may result in anxiety; cultures with low uncertainty avoidance ((e.g., the USA and the UK) are more comfortable with uncertain situations.

Power Distance: Cultures with high power distance (e.g., Malaysia and Mexico) are characterized by hierarchies in organizations and autocratic leadership. On the contrary, cultures with low power distance (e.g., Austria and New Zealand) have opposite characteristics.

Long-Term Orientation vs. Short-Term Orientation: Long-term time orientation plays a crucial role in Asian countries (e.g., Taiwan and China) that have been influenced by Confucianism. People in these countries believe strongly that accomplishments can be attained by hard working, and that virtuous behavior is characterized by diligence and perseverance. People in countries with short-term time orientation (e.g., the UK and USA) tend to prefer attaining goals based on schedules.

3.3 Culture and Web Usability

Barber & Badre [1] recommend a “culturability” approach which combines two words “culture” and “usability”. This approach is a systematic method used to examine hundreds of websites, and then to define cultural markers (preferences in a specific area) such as colors, fonts, icons, geography, sounds, motion, flags, language, preferences for text and graphics, directionality of how language is written, and so on.

Based on Barber and Badre’s [1] cultural marker approach, Smith et al. [20] show that it is essential to examine: (1) the different signs or symbols in a target culture to better understand how to create a website that is appropriately pitched to the target culture users, (2) the usage of signs based on the context, and (3) how the target culture audience interprets these signs. This can be achieved by conducting an audit of local indigenous sites.

3.4 The Hypotheses and Website Design Characteristics

Links: Sun [21] analyzed users from America, Germany, China, and Brazil for design preferences, and found different preferences in navigation among these countries. It was discovered that the German audience prefers links in the navigation bar, set up in alphabetical order, but this is not expected by Chinese and Brazilian users.

H1: Preferences for links differ between the UK and Taiwan cultures.

Multimedia: If multimedia can be applied appropriately, it can enrich the users’ experience. Incorporating multimedia into web interface design can be a very powerful method to convey a message beyond that of text, still images, but it is also an effective means to distract an audience [3]. Not all audiences expect or prefer the use of multimedia. Such preference depends on the cultural background of the users.

H2: Preferences for multimedia vary between the UK and Taiwan cultures.

Visual Presentation: Many images that do not transmit the same meaning in all cultures have been discovered in many previous studies [8]. Russo and Boor state, “Some users will recognize an image, but they will not associate it with the originally intended concept.” Web designers must comprehend differences among cultures in order to recognize images that are culturally specific [18].

H3: Preferences for visual representation vary between the UK and Taiwan cultures.

Layout: According to Barber & Badre’s study [1], people with different cultural backgrounds have particular preferences in orientation and layout structure on web

pages. Sun [21] suggests that a user from a low context culture (for example, Germany) would prefer a logical structure, while a user from a high context culture (for example, Japan) would prefer a paralleled structure and visual representation for information.

H4: Preferences for layout differ between the UK and Taiwan cultures.

Navigation: According to Marcus & Gould [17], Audiences from cultures with a high uncertainty dimension tend to prefer a navigation structure which can prevent them from getting lost. Simon [19] regards navigation and interaction as parts of the web communication interface. The diverse characteristics of web interface design have been examined, and it has been found that Asian and South Americans prefer navigation aids to change the appearance of the site without any concern for movements spatially.

H5: Preferences for navigation vary between the UK and Taiwan cultures.

4 Method

The cultural categories used in this research are based on national culture. Taiwan and UK were selected because they possess distinctly different cultural features, as based on Hofstede's cultural dimensions [12]. The UK is ranked 42/44, while Taiwan is ranked 29/30 in power distance among 53 countries; the UK is ranked 3rd, and Taiwan 44th in individualism vs. collectivism; the UK is ranked 9/10, and Taiwan 32/33 in masculinity vs. femininity; the UK is ranked 47/48, and Taiwan 26th in uncertain avoidance; and finally, the UK is ranked 18th, and Taiwan 3rd in long-term orientation vs. short-term orientation.

Local city government sites were chosen because they offer sufficient sample sizes for each culture. Generally, local government websites are mostly designed by local designers, and the design elements which are applied by the local designer will be an unconscious indication of the customs, norms, values, biases and preferences of the local culture. This kind of selection avoids the influence of corporate branding or company imaging.

In this local website audit stage, the cultural markers approach [1] is adopted. There are three steps in the procedure for identifying culturally preferred attributes.

Step 1: Foraging websites. Thirty local city government websites in each country were selected. Thirty county government websites in Taiwan and the top thirty populated city council websites in the UK were selected.

Step 2: Determining categories of web design characteristics and each variable. Firstly, previous research related to localization and design characteristics was consulted, such as that of Barber & Badre [1], Sun [21], Cyr & Trevor-Smith [6], and Würtz [23]. Secondly, the observation of the real features in the selected websites were integrated. Finally, five categories of website characteristics in this research were determined as visual representation, multimedia, navigation, links, and layout.

Step 3: Inspection and identification of culturally preferred design attributes. Each variable of all websites was inspected manually by two experts, one from Taiwan and the other one from the UK. As mentioned in the previous section, all va-

riables are divided into five categories. If the characteristic is not present in the web page, it will be given a 0 for categorical variables, but if the characteristic is present, it will be given a 1. The Taiwanese expert is undertaking a PhD in HCI design research at National Yunlin University of Science and Technology. The English expert has been running a multimedia company in Taipei for 6 years. Each expert reviewed 30 local government web homepages from his own country, providing ratings by nations. The analysis tool SPSS was used to carry out the cross-tabulation comparisons to examine if there were significant differences between the UK and Taiwan in each category. The results of all categories of variables are presented from Tables 1 to 5.

5 Results

All of the results of this local websites audit is listed in the following tables.

Table 1. Links

Variable	Actual count		Expected count	Chi-square	Degrees of freedom	Sig. Level
	Taiwan	United Kingdom				
Popup a new window	16	0	8	21.818	1	.000
Dynamic button	12	1	6.5	11.882	1	.001
Mouse over (color change)	25	17	21	5.079	1	.024
Mouse over (underlined)	8	21	14.5	11.279	1	.001

Hypothesis 1 was strongly supported. Results in Table 1 lend strong support that characteristics differ across two cultures. “Popup a new window” was found in more than 50% of Taiwanese websites, while none of the UK websites had these. Mouse over (underlined) characteristic was used in 70% of the UK sites, while only 26% of Taiwan sites had this feature. Color changed links were frequently used in both cultures, particularly among Taiwanese sites where more than 80% met this criterion. Dynamic button were found in 12 of Taiwanese websites, but in only one British website.

Table 2. Visual representation

Variable	Actual count		Expected count	Chi-square	Degrees of freedom	Sig. Level
	Taiwan	United Kingdom				
Iconic symbols	19	1	10	24.300	1	.000
Government identity symbols	27	27	27	.000	1	1.00
Image of leader	22	2	12	27.778	1	.000
Photo of accomplishment	17	0	8.5	23.721	1	.000
Images of group	14	2	8	12.273	1	.000
Images of daily life	0	16	8	21.818	1	.000
Photo of Animal/Plant	3	4	3.5	.162	1	.688
Photo of building	5	11	8	3.068	1	.080
Photo of landscape	12	4	8	5.455	1	.020
Cute style illustration	13	1	7	13.416	1	.000
Banner within color shape	2	9	5.5	5.455	1	.020
Banner within local city image	25	17	21	5.079	1	.024

Hypothesis 2 was supported. As demonstrated in Table 2, there were 9 significant preferences for visual representation variables across two cultures. Iconic symbols were found in many of the Taiwanese websites (63%), while only 1 of the UK website had this. Images of leaders were found in 73% of Taiwanese websites, but in only 25% of the UK websites. Photos of accomplishments are used in 60% of Taiwanese sites, but in none of the UK sites. Images of groups were used in 50% of Taiwanese sites, while only 2% of the UK sites had this feature. Surprisingly, none of the Taiwanese websites had images of daily life, while they were present in nearly 60% of the UK websites. The cute style illustrations are quite popular in Taiwanese local government websites, with 43% of Taiwanese websites utilizing this, but present in only one of the UK websites. Only 2 Taiwanese websites had banners within color shape, while nearly 30% of websites in the UK had these. Taiwanese have a strong preference for banners within local city image with 80% of Taiwanese websites having this, but only half of the UK websites utilized this.

Table 3. Multimedia

Variable	Actual count		Expected count	Chi-square	Degrees of freedom	Sig. Level
	Taiwan	United Kingdom				
Sound	3	0	1.5	3.158	1	.076
Stream video	16	0	8	21.818	1	.000
Flash animation	16	0	8	21.818	1	.000
Sliding pictures	16	21	18.5	1.763	1	.184
Moving picture	23	2	12.5	30.240	1	.000
Moving text	10	1	5.5	9.017	1	.003
Opening	10	1	5.5	9.017	1	.003

Hypothesis 3 was strongly supported. Results in Table 3 were consistent with the hypothesis that multimedia characteristics differ across Taiwan and the UK.

Multimedia are used to a greater extent in Taiwan than in the UK. Preferences for moving pictures, stream video, flash animation, moving text and opening features were statistically significant between the two cultures. Specifically, nearly 80% of Taiwanese sites used moving pictures and nearly 60% of Taiwanese websites used stream video and flash animation, while none of the UK websites contained stream video and only 1 website had flash animation. More than 30% of Taiwanese websites have both of these features, while only 1 of the UK websites had the moving text and opening features. The use of sound and sliding pictures did not differ significantly across cultures.

Table 4. Navigation

Variable	Actual count		Expected count	Chi-square	Degrees of freedom	Sig. Level
	Taiwan	United Kingdom				
Horizontal menu	27	24	25.5	1.176	1	.278
Vertical menu	28	23	25.5	3.268	1	.071
Home button	27	28	27.5	.218	1	.640
Search	20	29	24.5	9.017	1	.003
Accessibility icon	26	10	18	17.778	1	.000
Accessibility on text	0	14	7	18.261	1	.000

In general support of Hypothesis 4, an analysis of the results from Table 4 yielded the following findings. There were significant differences between Taiwan and the UK cultures. Specifically, more than 85% of Taiwanese websites had accessibility

icons, while only 10% of the UK websites had these. None of the Taiwanese websites had accessibility on text, while nearly 50% of the UK websites had this feature. Search functions are prevalent in Taiwan and in the UK; among the UK sites, 97% sites used the search function and it is also found in 67% of Taiwanese websites.

Table 5. Layout

Variable	Actual count		Expected count	Chi-square	Degrees of freedom	Sig. Level
	Taiwan	United Kingdom				
Two-column	8	12	10	1.200	1	.273
Three-column	22	14	18	4.444	1	.035
Multi-column	0	4	2	4.286	1	.038
Vertical menu on left	19	17	18	.278	1	.598
Vertical menu on right	7	6	6.5	.098	1	.754
Flexible width design	1	7	4	5.192	1	.023
Horizontal menu on top	21	21	21	.000	1	1.000
Information guide in bottom	3	10	6.5	4.812	1	.028

In support of Hypothesis 5, four preferences for layout vary between Taiwan and the UK. The three-column, flexible width design, multi-column, and information guide on the bottom differed across cultures. The three-column format was found in many of the Taiwanese websites (73%), but in only 18% of the UK websites. Flexible width design was exhibited in many more of the UK websites. Only 1% of Taiwanese websites had this feature, compared with 23% of the UK websites. Of all Taiwanese websites 10% had the information guide in the bottom, whereas the percentage increased to 33% in the UK websites. None of Taiwan websites had multi-columns, while 13% of the UK websites did.

6 Discussion and Implication

The results of the audit provide statistically significant evidence to support the hypotheses that design preferred characteristics differ between Taiwan and the UK. Results of this investigation were consistent with most hypotheses and lend support to the previous studies [12] [21] [23] that web designers need to carefully adapt interface features for culturally diverse users.

Various preferences exist between Taiwan and the UK, significantly in three categories of web features: links, multimedia and visual representation. Popup a new window, and dynamic button are used frequently on Taiwan sites, while mouse over (underlined) are found in 70% of the UK sites. With regard to multimedia, specifically, moving picture, stream video and flash animation aspects of multimedia are very popular on Taiwan websites, while none of the UK websites contained stream video and only one website had flash animation. One possible explanation for this difference is that Taiwan is oriented to a high-context culture, while the UK is considered a very low-context culture based on Hall and Halls’ theories. High context cultures (i.e. Taiwan) seek to assimilate human presence on their websites, and flash animation, text in motion has the potential to provide a sense of human representation; they prefer many sidebars and menus, with the opening of new browser windows for each new page. On the contrary, low context cultures prefer few sidebars and menus, constant opening in same browser window, and quick solutions. Flash animation or text in motion would lead to distraction for low context cultures (i.e. the UK).

As far as visual representation is concerned, iconic symbols were found in many Taiwanese websites (63%), while only one site had this attribute in the UK. Images of

leaders, photos of accomplishment, and images of groups were highly popular on Taiwanese websites, while very few of the UK sites used these. None of the Taiwanese websites had images of daily life, while they were present on nearly 60% of the UK websites. The speculation for the significant difference is that Taiwanese culture, with collectivism and high context, tends to be implicit and ambiguous, while the UK with low context culture tends to be explicit and clear. Thus, people from a high context culture (i.e. Taiwan) have preferences for images to help promote values characteristic of collectivist societies. People in the UK, with low context culture and individualism are inclined to take care of themselves and enjoy their lives, and usually tend to be independent of other people, preferring images that promote values characteristic of individualistic societies.

With regard to navigation and layout, none of Taiwanese websites had accessibility on text, while nearly 50% of the UK websites had this feature. More than 85% of Taiwanese websites had accessibility icons, while very few of the UK websites had this feature. The three-column format is found on many of the Taiwanese websites (73%), but on only 18% of the UK websites. One possible interpretation for the cultural preferences is that Taiwanese culture has a long-term time orientation and the UK has a short-term time orientation. Taiwanese users like to navigate in a parallel structure and read information shown in a pop up window and polychromic structure, while the UK users prefer to navigate in a monochromic structure and tend to want to quickly get results. These findings are consistent with the findings in the anthropological literature of Hofstede [12] and Hall and Hall [11].

Over all, this study implies that different kinds of culturally preferred attributes should be applied on websites to target different context cultures. Implicit culturally preferred design elements (i.e. graphics, images, color, moving text, stream video and flash animation) should be applied in high context culture, collective culture, long-term time orientation culture, while explicit culturally preferred design elements (i.e. logical and structured layout) should be applied in low context culture.

7 Conclusions and Looking Ahead

The results of this study have shown the need of localization; as such, they have the potential to help web developers and designers develop their web products as culturally appropriate. Also, the results of this study could be used in the construction of website experiment in further research, where the culturally preferred design elements would be incorporated in websites to test if the web reflects the user's culture can be more effective in communication. The communication effectiveness (usability) may be evaluated within six aspects: learnability, efficiency, minimal errors, satisfaction, comprehension, and desirability. Further, English and Taiwanese participants would be selected to participate in the web communication effectiveness (usability) test.

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