

Analyzing a Reflection of Uncertainty Avoidance Index Between Malaysian and Australian University Websites

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Abstract: A consideration of cultural issues in the design of web-based system can improve its usability. This study analyzed web features which were applicable to cultural dimension namely Uncertainty Avoidance Index (UAI) which contributed to cultural understanding and assisted web designers in customizing the websites to a specific culture. Quantitative content analysis was utilized through a t-test and discriminant analysis. About 60 samples of university websites were selected from Malaysia and Australia. The findings yielded that cultural dimension in terms of UAI play significant roles in web design. However, unexpectedly, Australian university websites depicted a higher index and scored highly in most elements. This finding is contradictory to the selected cultural theoretical framework. This study is beneficial for web policy makers and web designers of universities in providing a guide in terms of integrating cultural values for specific cultures. Future research should examine other cultural dimensions in universities of other countries to gain more insights into the relationship of culture and university web usability.

Key words: Cultural, dimension, uncertainty avoidance index, web, design

INTRODUCTION

Cultural dimension of usability: Besides the importance of features of websites, another essential factor to be taken into account is a cultural issue pertains to standardisation versus localisation of websites when catering to the large international market. Standardisation refers to an adoption of a culturally-neutral website while localisation is an adoption of a culturally sensitive website (Singh and Baack, 2004). This raises the question as to whether the web pages designed in one country are equally appealing to potential consumers in other countries. Cultural differences, thus have become an important issue in international interface design, yet most publications on this subject concentrate narrowly on guidelines for the internationalisation of the interface according to the country's and/or region's standards for language, date, measurements, currency, spelling, etc. (Galdo, 1990; Russo and Boor, 1993). The web is essential for it is a tool for transnational communication, participation and transaction for a multi-cultured environment. Barber and Badre argue that even though the web is considered "world-wide" and "global" it is still localised due to design and cultural constraints. Further,

cultural features like texts, layout and colours impact what is deemed "user friendly", hence the design must focus on a cultural context. Nielsen (1996) urges that the need to design for international interface has become paramount in the software industry.

Uncertainty avoidance index: Gaye explore fourteen cultural values which are divided into Hofstede (1980) four cultural dimension (i.e., Individualism vs. collectivism; power distance, masculinity versus femininity, uncertainty avoidance) and find significant differences in the depiction of cultural values. Hofstede (1980) illustrates five cultural dimensions ranging from power distance, individualism vs. collectivism, femininity vs. masculinity, uncertainty avoidance and long vs. short term orientation Hofstede (1980) conducts the most comprehensive study of IBM organisations on how values in the workplace are influenced by culture. From 1967-1973 while working at IBM as a psychologist, he collects and analyses data from over 100,000 individuals from forty countries.

Consequently, Hofstede (1980) develops a model that identifies four primary dimensions to differentiate cultures. Hofstede and Hofstede (2001) defines these dimensions as; power distance: "the extent to which the

less powerful members of organisations and institutions (like the family) expect and accept that power is distributed unequally”.

Uncertainty avoidance: “intolerance for uncertainty and ambiguity”; Individualism versus collectivism: “the extent to which individuals are integrated into groups”; Masculinity versus femininity: “assertiveness and competitiveness versus modesty and caring”. Meanwhile, Rajkumar (2003) analyses websites of Indian and US universities in relation to three cultural dimension; uncertainty avoidance, individualism/collectivism and long term orientation. He notes the significant differences among the three dimensions of the website design. A high degree of individualism is featured through the frequent appearance of pictures of individuals, “direct address” (using “you” as opposed to “we”) “personalisation features”, “expression of private opinion”, “individual success stories” (the US sites). On the contrary, the Indian sites present the “images of groups”, “formality of speech”, “inclusion of strong mission statements which reflect groups” and an inclusion of “stated opinions on group behaviour”. One interesting finding is that despite India’s low ranking for uncertainty avoidance index, the Indian sites provide “formal organisation charts”, “listings of rules and regulations”, “extensive legalese” and other guidelines. By contrast, only 20% of US sites present such information. The findings show that India possesses the characteristics of high uncertainty avoidance even though Hofstede (1980)’s index shows a contradicting scenario.

Problem statement: While the interfaces are essential for any websites, the increasing technological sophistication in many countries and the resulting broader world communication through the web imply the greater needs for the international aspects of user interfaces. Web users and shoppers increasingly consist of a multicultural community. Despite these large numbers of web users from various cultures, to date, little research has systematically examined web preferences of users related to a variety of online design characteristics (Cyr and Trevor-Smith, 2014).

Consequently, presenting appropriate and understandable web interfaces is a challenge due to a broadly different beliefs, attitudes and values. The sophistication of the user interfaces must reflect the language and cultural differences in the user perception. Based upon this notion, the universal capabilities of interface design for the web is questionable. When catering to the large international market, issues on cultural differences of websites emerge. A comparative

study of usability features of both websites from two different cultures lend insights into the cultural similarities and differences of the university websites across the East and West. The results yield the trend of websites whether the inclination toward standardisation or localisation of website design exists or not.

The importance of culture and web design has been highlighted in extant literature. Many studies have conducted pertaining to impact of culture on website design (Evers and Day, 1997; Khashman and Large, 2011; Kim *et al.*, 2009; Singh *et al.*, 2005; Sun, 2001). Several studies focus on website design features which reflect cultural values (Hu *et al.*, 2004; Khashman and Large, 2011; Okazaki, 2005) and various nationalities perceptions, attitudes and behaviour towards websites (Chau *et al.*, 2002; Cyr, 2013, Sorum *et al.*, 2012). These research are intended to explore the importance of cultural awareness in cross cultural website design in order to assist users ‘understand or searching for information according to their cultural values and expectations (Luna *et al.*, 2002; Simon, 2001; Singh *et al.*, 2005; Cyr, 2013).

When catering to the large international market, issues on cultural differences of websites emerge. A number of empirical research questions are raised by Callahan (2005): How do different cultures project the user interfaces on the web? How do the design interfaces interrelate? Are designs of websites in various cultures distinct or follow similar trends? If cultural variations are noted, what role do they play and what are their practical consequences?. The emerging issues with regard to the web then are 2 fold; whether to impose technologies of the internet and web which are culturally neutral (standardised) or whether to provide a culturally sensitive website (localised) (Singh and Baack, 2004).

Standardisation and localisation issues, hence become the main focus of university web designers as universities have a multi-cultural audience. Hence, this fact highlights the importance of analysing user interfaces and cultural reflections in university web design. As online era emerges, institutions have to compete globally as their universities have become business assets (Moore, 2004). Universities, thus have to employ marketing strategies in order to get people to remember their universities over other competitors as more prospective students are using the websites to search for information (Hitlin and Rainie, 2005; Pooch and Lefond, 2001). Hence, questions that always plague the web designers are which features should be included for their design to attract multi-cultural consumers. The question, then revolves around how to use features which reflect cultural values.

This study analyzes web features which are applicable to cultural dimension namely uncertainty Avoidance Index (UAI) which contributes to cultural understanding and assists web designers in customizing the websites to a specific culture.

MATERIALS AND METHODS

The study adopts a content analysis approach which provides the general insights on how universities in Malaysia and Australia feature their uncertainty avoidance index on the websites. In addition, the method also enables researchers to analyse the role of culture in university websites. Studying the content of websites is academically crucial but also challenging and interesting as it is an effective method for discerning patterns and themes in textual and graphic data. Websites are used to educate people, change people's minds or compel action. As argued by Scharl (2006) studying and analysing web content helps us to see what some real website producers and developers consider while making their websites.

Content analysis is chosen because it is used in a variety of fields such as marketing and media studies, literature, sociology, psychology, cultural studies and educational research. Content analysis is also applied as it is an appropriate method for answering most of the research questions in this study. Meanwhile, the quantitative method will be used in this study to explore what Sinha suggest that a subjective website experience can be quantified in terms of more specific dimensions of website quality such as content, interactivity, navigation, etc., in a reliable way. The measure is quantified in term of descriptive analysis.

Sampling: Random sampling is performed in which each website in the population has an equal chance of being included in the sample and the probability of a unit being selected is not affected by the selection of other units from the accessible population. First, the researcher chose the list of universities both in Malaysia and Australia from the portal of Ministry of Higher Education at www.mohe.gov.my and the portal of Ministry of Australian Higher Education at www.australianuniversities.com.au. The universities were coded and given number in the Microsoft Excel spreadsheet. Then, the Rand between function was used to randomly select 30 universities from each country. Then, second, the universities that did not fulfil the criteria were eliminated. The universities must possess the following criteria:

- The web sites are good and well developed. They are not under construction
- The web sites can be searched via the Yahoo and Google Search Engines

- The web sites must have at least one type of social networking sites (Blog, Flickr, Face book)

The university websites were filtered and 30 university websites each from Malaysia and Australia were selected.

Procedure: The t-test was administered to find the significant difference of cultural values between Malaysian and Australian university websites. In addition, a discriminant analysis was conducted to further confirm whether a set of variables is effective in predicting category membership. Discriminant analysis is a statistical analysis which is used when groups are known a priori and is useful in determining whether a set of variables is effective in predicting category membership (Green and Salkind, 2008).

Discriminant analysis can be used with small sample sizes. It has been shown 6 that when sample sizes are equal and homogeneity of variance/covariance holds, discriminant analysis is more accurate (Buyukozturk and Cokluk, 2008). A classification can be predicted based on the continuous variables or assess how well the continuous variables separate the categories in the classification predictor variables used for uncertainty avoidance index are links to homepage from any page, enable cross browser compatibility, use sitemap, provide feedback on users location, place important items at top centre show researcher's credential and contact information, place primary navigation menus in the left panel and use colour for grouping).

Hofstede's framework: Framework used for the present study is Hofstede's cultural theory. Hofstede (1980) illustrates five cultural dimensions ranging from power distance, individualism vs. collectivism, femininity vs. masculinity, uncertainty avoidance and long vs. short-term orientation.

Malaysia scores highly on the dimension of Uncertainty Avoidance Index (UAI) and Power Distance Index (PDI). According to Hofstede (1980) the combination of these two high scores (UAI) and (PDI) reflect societies that are highly rule-oriented with laws, rules, regulations and controls in order to reduce the amount of uncertainty. Meanwhile, inequalities of power and wealth have been allowed to grow within the society.

RESULTS AND DISCUSSION

Uncertainty avoidance index comprised 8 features namely "links to the homepage from any page", "Enable cross browser compatibility", "use sitemap", "provide feedback on users location", "place important items at top centre", "show researcher's credential and contact information", "place primary navigation menus in the left

panel”, “use colour for grouping”. The features are based on categorization by King (2008). The features are selected based on the ones which show significant differences between both websites of Malaysian and Australian universities. This is to better measure the extent to which unique cultural values influence usability (King, 2008). The study illustrates the features of Uncertainty Avoidance Index.

**Features of uncertainty avoidance index
Uncertainty avoidance index:**

- Links to the homepage from any page
- Enable cross browser compatibility
- Use sitemap
- Provide feedback on users location
- Place important items at top centre
- Show author’s credential and contact information
- Place primary navigation menus in the left panel
- Use colour for grouping

Next, the aggregate score for the dimension was calculated. Then, a one-way analysis of variance was conducted. The results are illustrated in Table 1. UAI showed a statistical significant difference between both Malaysian and Australian university websites. Surprisingly, Australian university websites (M = 6.2, SD = 0.50) depicted higher Uncertainty Avoidance Index than the Malaysian websites (M = 5.5, SD = 0.47).

Then, a cluster analysis was conducted to determine whether these 60 websites would be divided in two groups (Malaysian and Australian websites) in terms of UAI. The combination of hierarchical and non-hierarchical methods was used. Firstly, hierarchical clustering was used to determine the number of clusters. Then, agglomerative technique and Ward (1963) method were utilised to maximize between sample variations and minimize within sample variation. As a result, hierarchical cluster analysis produced two cluster solutions. Next, k-means clustering was applied to further improve the cluster solution and to determine the stability of the clusters statistically. K-means cluster analysis resulted in two clusters containing 38 and 22 websites each. The first cluster consisted of 30 Australian and 8 Malaysian university websites while 22 Malaysian university

websites belonged into the second cluster. Consequently, the Malaysian and Australian websites were divided into two clusters based on UAI, cultural value, dimension. The analysis showed that UAI is the strong indicator. Table 2 illustrates the features which show significant difference across the two clusters. Based on the cluster analysis results, all the features under UAI showed significant difference.

Hypotheses: In terms of Uncertainty Avoidance Index, eight hypotheses are devised as follows:

- H_{2d}: university websites with a higher uncertainty avoidance index use more features of links to the homepage from any page than university websites with a lower uncertainty avoidance index
- H_{2e}: university websites with a higher uncertainty avoidance index use more features of enable cross browser compatibility than university websites with a lower uncertainty avoidance index
- H_{2f}: university websites with a higher uncertainty avoidance index use site maps more than university websites with a lower uncertainty avoidance index
- H_{2g}: university websites with a higher uncertainty avoidance index include provide feedback on user’s location more than university websites with a lower uncertainty avoidance index
- H_{2h}: university websites with a higher uncertainty avoidance index include place important items at top centre more than university websites with a lower uncertainty avoidance index
- H_{2i}: university websites with a higher uncertainty avoidance index include show researcher’s credential and contact information more than university websites with a lower uncertainty avoidance index
- H_{2j}: university websites with a higher uncertainty avoidance index include Pplace primary navigation menus in the left panel more than university websites with a lower uncertainty avoidance index
- H_{2k}: university websites with a higher uncertainty avoidance index include use colour for grouping more than university websites with a lower uncertainty avoidance index

The results for the features are listed in Table 3. All features show a significant difference between website of Malaysian and Australian universities. Surprisingly, only three features showed that Malaysian university websites scored higher than the Australian whereas the Australian university websites scored higher for other five features.

Table1: ANOVA results for UAI
Uncertainty Avoidance index

Dimension	M	SD	F-statistics	Sig.
Malaysia	5.5	0.47	26.8	0.00
Australia	6.2	0.50	5.0	0.00

Significant at 0.05

Table 2: ANOVA results for cluster analysis

	Cluster		Error		F-statistic	Sig.
	Mean square	df	Mean square	df		
Uncertainty avoidance						
Links to the homepage from any page	64.488	1	0.697	58	92.477*	0.000
Enable cross browser compatibility	140.404	1	1.773	58	79.181*	0.000
Use sitemap	119.524	1	5.092	58	23.474*	0.000
Provide feedback on users location	32.688	1	2.415	58	13.538*	0.001
Place important items at top centre	0.583	1	0.097	58	6.042*	0.017
Show author's credential and contact information	8.048	1	1.564	58	5.147*	0.027
Place primary navigation menus in the left panel	19.430	1	2.905	58	6.668*	0.012
Use colour for grouping	11.147	1	0.891	58	12.505*	0.001

significant at 0.05

Table 3: ANOVA results for Uncertainty Avoidance Index category (UAI)

Category feature	Malaysia				Australia			
	M	SD	F-statistics	Sig. (2-tailed)	M	SD	F-statistics	Sig. (2-tailed)
UAI								
Links to the home page from any page	4.5	1.17	92.40	0.0	6.40	0.57	77*	0.0
Enable cross browser compatibility	3.6	1.56	79.10	0.0	6.90	0.73	81*	0.0
Use site map	6.1	2.07	23.40	0.0	4.00	2.78	74*	0.0
Provide feedback on users location	4.5	1.76	13.50	0.0	6.00	1.29	38*	1.0
Place important items at top centre	7.0	0.00	6.04	0.0	6.80	0.43	2*	17.0
Show author's credential and contact information	7.0	0.00	5.14	0.0	6.13	1.74	7*	27.0
Place primary navigation menus in the left panel	5.1	2.05	6.68	0.0	6.10	1.33	8*	12.0
Use colour for grouping	6.2	1.27	12.50	0.0	6.90	0.55	5*	1.0

The Malaysian university websites scored higher in “use site map” (M = 6.1, SD = 2.07) “place important items at top centre” (M = 7.0, SD = 0.0) and show author’s credential and contact information” (M = 7.0, SD = 0.0). However, the difference with the Australian university website for the last two items 10 did not show much difference (M = 6.8, SD = 0.43 and M = 6.1, SD = 1.74) compared to the “use of site map” (M = 4.0, SD = 2.78). Apparently, although the scores were lower for the three features, Australian university websites still showed a range of well and excellent depiction. Based on the results, H_{2f}, H_{2h} and H_{2i} were supported as Malaysian university websites presented more features of “use site map”, “place important items at top centre” and “show author’s credential and contact information”.

On the other hand, Australian university websites scored higher for five features namely “links to the homepage from any page” (M = 6.4, SD = 0.57) “enable cross browser compatibility” (6.9, SD = 0.73) “provide feedback on users location” (M = 6.4, SD = 0.57) “place primary navigation menus in the left panel” (M = 6.1, SD = 1.33) and “use colour for grouping” (M = 6.9, SD = 0.55). Although, Malaysian university websites depicted lower projection on “enable cross browser compatibility” (M = 3.6, SD = 1.56) others were still in good depiction. Hence, based on the results, H_{2d}, H_{2e}, H_{2g}, H_{2j} and H_{2k} were not supported as Australian university websites presented more features of “links to the homepage from any page”, “enable cross browser

compatibility”, “provide feedback on users location”, “place primary navigation menus in the left panel” and “use colour for grouping”.

The objective is to examine uncertainty avoidance index of the university websites. The results state that there is a significant difference in. Only three hypotheses are supported. Interestingly, Australian university websites tend to have higher uncertainty avoidance index. Based on Hofstede (1980)’s cultural dimension, Australia ranks low in uncertainty avoidance while Malaysia ranks high in uncertainty avoidance. However, the present study finds the opposite trend in which Malaysia adheres to uncertainty avoidance guidelines with a comparatively low score which is unexpected considering the culture’s preference for the uncertainty avoidance dimension. The results of present study is in line with other studies (Callahan, 2005) which find that western websites demonstrate more uncertainty avoidance features compared to Eastern websites. Does this mean that Western universities have internationalisation strategies to attract students from the East or as argued by Callahan (2005) whether the aspects of uncertainty avoidance index of Hofstede (1980) should be revised? On the same note, some researchers argue that this dimension is not accurately reflected in cross-cultural website design (Baack and Singh, 2007; Singh *et al.*, 2005; Singh and Baack, 2004). However, Liu argues that this should be caused by omissions of some features in the coding scheme which would reflect a significant difference in uncertainty avoidance score across countries. She further

suggests that a well-refined and comprehensive coding scheme be developed through focus group or other qualitative methods, to enhance the validity and reliability of the instrument.

This move is timely as Ford and Gelderblog find that websites with high orientation of uncertainty avoidance improve general usability. Looking at the development, more research should be geared towards analysing the uncertainty avoidance index for different countries using larger samples.

CONCLUSION

In conclusion, the findings show that cultural dimension in terms of UAI play significant roles in web design. Yet, Australian university websites depict a higher index and score highly in most elements. This finding is contradictory to the selected cultural theoretical framework. This study is beneficial for web policy makers and web designers of universities in providing a guide in terms of integrating cultural values for specific cultures. Future research should examine other cultural dimension in universities of other countries to gain more insights into the relationship of culture and university web usability.

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