Website Design Based on Cultures: An Investigation of Saudis, Filipinos, and Indians Government Websites' Attributes

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Abstract. Saudi Arabia as a country that attracts foreign workers especially from Asia needs to take into consideration the requirements of multinational cultures when providing its government e-services. This paper investigates the user interface design of top government websites of Kingdom of Saudi Arabia (KSA) in comparison with the top government websites of the Philippines and India. The study present the web design attributes which are commonly used specifically to government websites of the three countries included in this study. With the utilization of inferential statistics, results show that there is no significant difference of culturally web design attributes of the top government websites found among the three cultures. The study can be used as guidelines in order to enhance the website's user interface in a specific culture and to allow web designers to base their websites on the cultural background of the target website users. The findings of the study can also contribute to assist web developers and designers in developing websites that are culturally suitable for expatriates in a country such as KSA.

Keywords: Cross-cultural, Globalization, India, Internationalization, Philippine, Saudi Arabia, User Experience, User interface, Web design.

1 Introduction

The World Wide Web (WWW) is a collection of documents called web pages that are linked together and anyone can access them through the use of the Internet. The WWW is composed of: demographic module, user-attitude module, cultural variable module, population-stereotype module, subjective preference module, and usability testing module for the purpose of consolidating interaction data [1]. The website's usability testing seems to be one of the most essential sub-modules because it includes website's suitability for the target web users and it measures its effectiveness, efficiencies, and web users' satisfaction. As far as usability is concerned, cross-cultural usability is about creating websites with an efficient way of communication between a global website owner and a local user [2]. The web designers should bear in mind that the objective of any website is to enable its users to experience success and satisfaction [3]. Therefore, to be able to meet the users' cultural expectations,

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website designers need to merge usability knowledge with cultural insights which will have a return of lower costs and better acceptance [4].With regards to cross-cultural usability, the cultural background of the users plays a significant role in website design in order to have an effective communication with the websites' target users. This will ensure that the website is created objectively rather than subjectively in terms of users' cultures and websites' characteristics or attributes. It is important to note for the web designer that the cultural background of the website target users has a momentous impact in terms of understanding and accepting the created website [5]. However, the problem is that website users differ across regional, dialectal, country boundaries and user requirements which are based on users' local cultural perception [2]. Therefore, the consideration for cross-cultural analysis and design issues is needed during the planning stage and the web designers should have a checklists and guidelines in order to aid them in the design process [6]. Through cross-cultural analysis the web designers would be able to determine if their design is culturally biased, if based on their own assumptions and perceptions. Nowadays, numerous cross-cultural and website design studies proposed a cultural localization model based on anthropologists' cultural standards [5]. Due to the fact that in cross-cultural studies, it is necessary that the individual cultures be examined and investigated to build up rich repositories intended for website designing, this will make website creation less expensive and less time consuming for designers, companies and researchers when gathering information about different cultures around the world [7].KSA as a country that attracts foreign workers especially from India and Philippine need to consider culture attributes when designing its government e-services. Hence, it is imperative to investigate the cultural preferences of the website target users in order to create a website design that is suitable for different users and their cultures. In fact, the challenge for every web designer in cross-cultural design is to make a functional technology significant to local users [8].Based on the cultures and website attributes, the objectives of our study are: 1) to present the distinct cultural dimensions of KSA, Philippine, and India; 2) to examine these three countries' government websites focusing on website's attributes that are vital in website designing; 3) to identify if these government websites were designed based on cultures; and; 4) to determine if there are significant differences among the three cultures. The study also sought to answer the following hypotheses:

- H1: The preference in visual presentation attribute varies among the cultures of Saudis, Filipinos, and Indians.
- H2: The preference in navigation attribute varies among the cultures of Saudis, Filipinos, and Indians.
- H3: The preference in links attribute varies among the cultures of Saudis, Filipinos, and Indians.
- H4: The preference in layout attribute varies among the cultures of Saudis, Filipinos, and Indians.
- H5: The preference in multimedia attribute varies among the cultures of Saudis, Filipinos, and Indians.

The paper is organized as follows: section 2 provides a brief overview of Hofstede's cultural dimension, and website design attributes. Section 3 presents our research methodology. Section 4 presents the obtained results. Section 5 discusses the results and finally section 6 concludes the paper with our study limitations and future perspectives.

2 Background

In this section, we will provide a brief overview of the concepts underpinning our study.

Hofstede's Cultural Dimension. The Hofstede's model is the commonly used model [9] to study and evaluate the cross-cultural challenges in websites' design interface. According to Hofstede's model [10], there are five cultural dimensions, which are:

- **Power Distance:** It is measured on the basis of dissimilarities in the culture [11]. It characterizes the hierarchies that exist in businesses and the kind of leadership that the leaders of the country have implemented.
- **Individualism:** It signifies people's inclination for a loosely-knit social framework which is the contrary of collectivism which preference is towards tightly-knit social framework [11]. Individualism is where people are supposed to take care of themselves, while collectivism is where people look out for each other which mean their focus is more on group's welfare.
- **Femininity/Masculinity:** It refers to the gender roles that exist within cultures. This is the degree of different assignments given to male and females [11][12].
- **Uncertainty Avoidance:** It is defined as the degree to which the members of a culture considered vulnerable by vagueness, ambiguity and the unknown, along with their enthusiasm to avoid these circumstances [11][12]. People with high uncertainty avoidance are people with low tolerance for risk and refuse new ideas while people with low uncertainty avoidance are risk-takers people.
- **Long Tem Orientation:** It is where people tend to believe that accomplishments could be achieved through hard work, diligence and perseverance. This is in contradiction to short-term orientation, where people accomplish their goals based on schedules [13].

Website Design Attributes. Website attributes are the user interface characteristics of a particular website. In order for users to accept a website, it is necessary to identify their preferences in terms of design, because if this will be taken for granted, the design could lead to anxiety or discomfort most especially to those users who are physically handicapped [11]. The interface design elements are visual elements such as colors, color combinations, etc. and they must reflect their own meanings to be equal with the expectations of the target web users [2]. Indeed, it is very significant for the website designers to consider the role of national culture in order to implement a successful website [12].

3 Related Studies

In this age of globalization, culture is the vital factor for the design of usable websites [14]. Numerous studies state that many websites fail due to web designer's insufficient understanding of the target users' local culture. As culture becomes critical issue in website design, web designers have started to realize it's important and integrate them to the website development process [1]. In fact, Hsieh and Hong [13] in their study stated that there is an increase in terms of research related to cultures, however there is few research which actually investigated users' preferences across cultures. Their study focused on the implication of different culturally preferred attributes that are needed to apply on websites to target users. They found that there is a significant difference in culturally design attributes among websites of two different cultures. Therefore, their recommendation entails the need for localization in order to help web designers and developers to develop websites that are culturally appropriate. Similarly, Hsieh, Chen, and Hong [15] found that there are significant differences in web design characteristics or attributes in each web design categories. Their findings serve as an evidence to sustain the hypothesis that web design preferences differs among diverse cultures. The value of localization in building and designing a website was emphasized in their study. In contrast, Aladwani [12] found that there are no significant differences between two different cultures; despite of this result it was revealed in the study that there is a significant variation between two cultures with regards to perception in the performance of quality attributes of e-government websites. He also argued that e-government quality variations might be the result of cultural differences which means that there are attributes that users may not be equally high regarded by different users worldwide. Moreover, Smith, et al. [16] believed that cultural factors such as Hofstede's cultural dimensions can create a significant contribution to website culturability. Cultural differences can be used as a tool to communicate with the website designers, evaluators, and users. Their research provides a complete understanding of the relationship among cultures in order to create more reproducible methods of all types of website users, but not a claim that there is a cultural difference among cultures.

4 Significance of the Study

Countries have their own distinct cultural dimensions such as the three countries involved in our study which are: KSA, Philippines, and India. The countries' selection is due to the main fact that with KSA's 9.3 million of expatriates [17], more than 1.2 millions of those people are from the Philippines and more than 1.5 millions of people are from India [18]. Aside from these facts, these countries have their own distinct cultural attributes as indicated in Hofstede's country cultural dimensions [10]. KSA is ranked 5th, Philippines is ranked 3rd, while India is ranked 7th in power distance

among 66 countries. In individualism, KSA is ranked 25th, Philippines is ranked 29th, while India is ranked 21st. In masculinity, KSA is ranked 17th, Philippines is ranked 9th, while India is ranked 15th. In uncertainty avoidance index, KSA is ranked 19th; Philippines is ranked 33rd, while India is ranked 34th. Finally, in long-term orientation, the Philippines is ranked 17th, while India is ranked 7th. KSA as one of the Arab countries was not classified under long-term orientation dimension. On the other hand, having consideration that long-term dimension cultures support planning, which is used by Arab countries such as KSA to lessen uncertainty, this concludes that their culture could be classified under long-term orientation [19]. This paper presents the arguments that website design is beyond user interface which is a contradiction of the website design globalization claimed by a number of research. Moreover, our paper serves as an additional support of the argument presented that there is no significant relationship between the software (i.e. website) and cultures [20][21][22][23].

5 Research Methodology

The major factors to consider in this study are website design attributes that are very vital in designing a particular website and will aid website designers. The website design attributes include [13]:

Visual Presentation: It consists of pictures, symbols, icons, and other related graphics to attract the target users. No matter how elegant the websites' visual representation is, the differences with regards to language and culture will still remain in the website users' perception. As a result, the original usability work on a website's interface cannot be trusted by certain individual to be essentially and evenly usable around the world. Based upon this conception, the universal capabilities of interface design for the WWW is uncertain [24]. Among the visual presentation features that are specifically examined in this study are icons, symbols, images, photos, style presentation, and banners.

- **Navigation:** It includes different navigational tools, menu formats, links, and the availability of search engines. These will be used by target users as a way of assisting them to get the desired information. Specific navigation features that are examined in this study are menu style (vertical or horizontal), search, and accessibility icons and text.
- **Links:** It makes the website easier to navigate for the target users. It helps the user to go to another web page and back to the previously visited web page. Specifically, the links features that are examined in this study are pop up new window, dynamic button, color change and mouse over.
- **Layout:** It enables the target users to easily access information within a contextual and structural model. The layout features that are specifically examined in this study are column structure (single, 2-column, or 3-column), vertical and horizontal menu, and flexible width design.

- **Multimedia:** This includes: sounds, animation, moving text and streaming videos which will enrich the experience of the target users with the website [13]. The layout features that are examined in this study are sounds, stream video, flash animation, moving pictures and text, and opening page.

Our study evaluated website attributes of the top government websites for each of the three countries (KSA, Philippines and India). Government websites were chosen since, to some extent, they reflect a country's culture; this will lessen the personal influence of website designers and of any company image. The study used descriptive method of research to identify the characteristics of each selected website, and to analyze the results, specifically the significant difference of web design attributes culturally. Also, inferential statistic, particularly chi-square test, was employed in this study. To apply the methodology, we utilized three procedures for evaluation, namely: 1) the identification of website characteristics (visual presentation, navigation, links, layout and multimedia) based on the instruments used, validated, and tested in [15], 2) three experts' (KSA, Philippines, and India) review of these government websites, and 3) the analysis of the results through the use of chi-square which will allow us to compare the results of KSA's government websites with the results of the Philippine's and India's government websites. The evaluation of the websites is through the use of a validated questionnaire which needs to be answered by website experts from three different countries indicating 0 if the website attribute is not present in the government website and 1 if it is present.

6 Results

The results of each website design attributes' variables are presented in this section. Sample interfaces for the three countries government websites are presented in Figures 1 to 3. We took the website of foreign affairs of each country as an example of government websites since the said website is the most common visited by numerous foreign nationals.

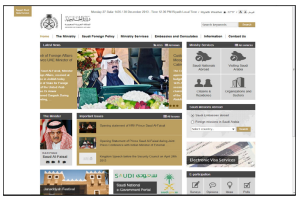

Fig. 1. Ministry of Foreign Affairs, KSA

Fig. 2. Department of Foreign Affairs, Philippines

Fig. 3. Ministry of External Affairs, India

In each website design attributes, the actual counts are noted and presented in Tables 1 - 5.

Table 1. Visual Presentations

Variable	Actual Count			Expected Count	Chi-Square	Degrees of Freedom	p-value
	KSA	Philippines	India				
Iconic symbols	10	10	10	10.00	0.000	2	1.000
Government identity symbols	10	9	10	9.67	0.069	2	0.966
Images of leader	7	5	8	6.67	0.700	2	0.705
Photo of accomplishment	8	9	9	8.67	0.077	2	0.962
Images of group	10	10	10	10.00	0.000	2	1.000
Images of daily life	6	9	4	6.33	2.001	2	0.368
Images of animal/plant	1	1	2	1.33	0.063	2	0.969
Cute style illustration	5	7	5	4.67	1.209	2	0.694
Banner within color shape	10	10	9	9.67	0.069	2	0.966
Banner within local city image	6	3	3	4.00	0.688	2	0.709

As shown in Table 1, there is no significant difference between KSA, Philippines, and India in terms of websites' visual presentation. This means that the preferences for visual presentation attributes do not vary among the users of the three countries which is a contradiction of the findings of other research on cross cultural analysis of website design e.g. [13][15]. The findings in this attribute revealed that the top common features that the three countries government websites used are "iconic symbols", "government identify symbols", "images of group", and "banner within color shape". The "images of leader" were found in 80% of the India's websites, 70% in KSA's, and 50% in the Philippine's. The results of the three features namely "iconic symbols", "government identity symbols" and "images of leader" signify that the three countries have strong power distance (KSA – 95, Philippines – 94, and India – 77) which means that there is unequal power distribution among them and this can also be easily seen in their organizational charts. The power distance also explains that the people of these countries accept hierarchy. The "photo of accomplishment" feature was found in most of the websites of the Philippines and India which has a percentage of 90% and only 80% in KSA. The "images of daily life" feature was seen in the websites of the Philippines with a percentage of 90%, 60% in KSA's websites but only 40% in India's websites. In ten percent of KSA and the Philippines websites the "images of animal/plant" feature was found and 20% in India's websites. The "cute style illustration" feature were found in the Philippine's website in about 70% and 50% both in KSA and India's websites. While in terms of "banner within local city image" feature, 60% were found in KSA's websites, and 30% were found in the Philippines and the same percentage with India's websites.

Table 2. Navigation

Variable	Actual Count			Expected Count	Chi-Square	Degrees of Freedom	p-value
	KSA	Philippines	India				
Horizontal menu	10	9	10	9.67	0.069	2	0.966
Vertical menu	4	8	6	6.00	1.333	2	0.513
Return to home button	10	10	10	10.00	0.000	2	1.000
Search	10	10	10	10.00	0.000	2	1.000
Accessibility icon	10	10	10	10.00	0.000	2	1.000
Accessibility on text	10	10	10	10.00	0.000	2	1.000

As shown in Table 2, there is no significant difference between KSA, Philippines, and India in terms of websites' navigation. This means that the preferences for navigation attributes do not vary among users of the three countries. The findings in navigation attribute revealed that the top common feature of these countries are the use of features such as "return to home button" , "search", "accessibility icon", "accessibility on text" and "horizontal menu". As far as the "vertical menu" feature was concerned, 80% of the Philippine's website used this feature, 60% were found in India's websites, and only 40% in KSA's websites.

Table 3. Links

Variable	Actual Count			Expected Count	Chi-Square	Degrees of Freedom	p-value
	KSA	Philippines	India				
Popup a new window	0	1	0	0.33	0.250	2	0.882
Dynamic button	10	10	10	10.00	0.000	2	1.000
Color change	8	10	10	9.33	0.286	2	0.867
Mouse over (underlined)	7	10	10	9.00	0.667	2	0.717

As shown in Table 3, there is no significant difference between KSA, Philippines, and India in terms of websites' links. This means that the preferences for links' attributes do not vary among the users of the three countries. The findings show that the top common features of these countries are the features such as "dynamic button", "color change", and "mouse over (underlined)". None of the government websites in KSA and India had a "popup new window" feature, but only 10% of the Philippine's websites used this feature.

Table 4 shows that there is no significant difference between KSA, Philippines, and India in terms of websites' layout. This means that the preferences for layout attributes do not vary among the users of the three countries. The findings in this attribute revealed that the "flexible width design" and "horizontal menu on top" features were the top common features that are used by the websites of these countries. None of the government websites in KSA used "single column" feature, but 10% of the websites of the Philippines and India used this. The "two column" feature were not found in the Philippines websites, but was used by 50% of the KSA's

Table 4. Layout

Variable	Actual Count			Expected Count	Chi-Square	Degrees of Freedom	p-value
	KSA	Philippines	India				
Single-column	0	1	1	0.67	0.125	2	0.939
Two-column	5	0	4	3.00	2.917	2	0.233
Three-column	5	9	5	6.33	1.685	2	0.431
Vertical menu on left	4	7	5	5.33	0.876	2	0.645
Vertical menu on right	5	8	3	5.33	2.376	2	0.305
Flexible width design	10	10	10	10.00	0.000	2	1.000
Horizontal menu on top	10	9	10	9.67	0.069	2	0.966
Information guide on bottom	8	5	9	7.33	1.182	2	0.554

websites, and 40% of the India's websites. Fifty percent of the KSA's websites and India's website used "three-column" feature while 90% of the Philippines' websites have used it. The "vertical menu on the left" was found in 70% of the Philippines' websites, 50% of the India's, and only 40% of KSA's. In terms of "vertical menu on the right", 80% of the Philippine's websites used this feature, 50% of KSA's, and only 30% of India's websites. Ninety percent of the India's website had "information guide on bottom" feature (a feature that includes site maps that serves as a guide for users), 80% of KSA's websites, and only 50% of the Philippines' websites. The availability of "information guide on bottom" feature among the three countries government websites implies the scores of these countries in Hoftede's cultural dimensions of uncertainty avoidance (KSA scores 80, Philippines scores 44, and India scores 40). This further explains that the higher score of KSA in uncertainty avoidance means that the country has a preference for avoiding ambiguity and the country maintains rigid codes of beliefs and behavior which is very true with KSA since the country has been known for conservativeness. In case of the Philippines with a score of 44, it means that the country has low preference when it comes to uncertainty avoidance and this explains that the people has more relaxed attitude whereby innovation is not considered a threat. While in India with a score of 40, it means that the country has a medium low preference in avoidance uncertainty, where people accept the imperfection and people used to believe that nothing is impossible as long as people knows how to adjust in whatever circumstances.

Table 5 shows that there is no significant difference between KSA, Philippines, and India in terms of the websites' multimedia. This means that the preferences for multimedia attributes do not vary among the users of the three countries. The findings in this attribute show that the "flash animation" feature is the widely used feature among the three countries: 80% of the Philippines' websites, 70% of KSA's websites, and 50% of the India's websites. The "sound" and "stream video" features were used by 40% of KSA's and Philippine's websites, while only 10% of the India's websites. "Moving picture" and "moving text" features were used by over 60% of the India's

Table 5. Multimedia

Variable	Actual Count			Expected Count	Chi-Square	Degrees of Freedom	p-value
	KSA	Philippines	India				
Sound	4	3	1	2.67	0.781	2	0.677
Stream video	4	3	1	2.67	0.781	2	0.677
Flash animation	7	8	5	6.67	0.700	2	0.705
Moving picture	3	2	5	3.33	0.625	2	0.732
Moving text	4	1	7	4.00	3.188	2	0.203
Opening	2	0	0	0.67	1.125	2	0.570

websites, while over 30% of the KSA's websites and over 10% of the Philippine's websites. The "opening page" feature is not widely used by most of the websites in the Philippines and India's, but 20% of KSA's websites had this feature.

7 Discussion

The hypotheses of this study support that the key to interact with web users and to perceive the usability and usefulness of websites is to design a website that is based on the cultural background of the target web users [3]. The results of our study revealed that there is no significant difference among website attributes between the three countries involved in this study. In terms of visual presentation, the use of images of animal/plant is not popular to the three countries' government websites having 10% of the websites both in KSA and in the Philippines and only 20% in India. The reason behind this low value can be attributed to the fact that these three countries do belong in the countries with low context culture [25] which have inclination for images that upholds values characteristics of individualistic societies and this is also indicated with the Hofstede's ranks of each country in terms of individualism. The banner within local city image is moderately popular in KSA's government websites but not with the Philippines and India's government websites. The quite remarkable average percentage of 90% in KSA's government websites displaying the images of leaders and government symbols can be explained that KSA's are known for being passionate with their religion and government which patriotism can be easily seen in their websites having constant indication of the color of their flag and their iconic symbols. In terms of navigation, the use of vertical menus is popular in the Philippines, while moderately popular in India but not much in KSA. This can be explained that KSA and India's web users navigate in monochromic structure [25] which handles the task one at a time while the Philippines's web users prefers to navigate in a polychromic structure [25] which prefers to do many tasks simultaneously. In terms of links, the use of popup windows is not popular to the three countries. The explanation for this is that since the three countries have low context culture, most of the web users' preference is to have a constant opening in the same browser window for quicker results. As far as layout is concerned, none of the government websites in KSA do have single-column layout

and only one government website in the Philippines and India. None of the government websites in the Philippines do have two column, but moderately popular in KSA's and India. The results are quite obvious that nowadays websites are mostly designed into three-column layout rather than in one-column and two-column layout which is more likely preferred by most web users because this will allow them to view most of important links and information available in the websites.

8 Conclusions

It is a challenging task for every web designer to create a website that is suitable for the target population. The target users are the vital part in building any website. Each web design attributes needs to be given high regard to be able for the web designers to avoid subjectivity in their design. Most of the previous research related to this study does not have proper way to utilize cultural factors into web development and no experimental study of the website interface, which supports the cross-cultural web design model [26]. But if these websites' interface is culturally well designed, it will allow the websites' functionality to carry the user's task. Nonetheless, if the website's interface is insufficiently designed, its performance is unambiguous and it will be difficult for the users to accomplish their task [27]. Thus, this study intends to assist web developers and designers to adopt the users' needs from different cultures. This will improve the website users' interface when cultural factors are integrated. Even though the previous statements are factual, the results of the study clearly indicated that there is no significant differences in terms of website attribute's preferences among different cultures and that difference in cultures with regards to web design do not vary. The study has a number of limitations that are needed to consider for future research. First, there were 10 top government websites for each country that are included and evaluated by experts in this study; a higher number is recommended to recalculate the significant differences of these three cultures. Second, the type of websites involved are government websites which we believe are designed culturally appropriate since the websites target users includes those individuals from all walks of life; the results could be more stronger if the type of websites have covered corporate websites. These limitations must be taken into consideration to further improve culturability among websites whether of government or of corporate in order to promote usability improvement.

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