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Culturability: A Design Framework for Asian University Websites based on Malaysia and Pakistan

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ABSTRACT

Website usage has grown tremendously over the past few years especially within Asian countries. Our daily activities such as reading news, buying or selling products and even communication has been utilized in tandem with some form of web based technology. Websites have become an essential channel for online activities such as education, business and even research. Similar to an organizational or informational website, a university website serves as an initial platform of interaction with different users specifically potential students. Previous research has identified that any website should have several components such as metaphors, images, tactile experience and more. However, depending on the geographic location such as Asian countries, different cultural backgrounds may influence those components and the overall usage experience for websites specifically for university. As such, this research aims to identify the cultural aspects that could affect the usability experiences of users within those countries. By utilizing two different countries, Malaysia and Pakistan, along with the Cultural Marker Model, we aim to enhance the usability design of websites that caters to the cultural requirements for other Asian countries as well as global. By utilizing a prototype based on specific evaluated features, a usability design framework was developed that assist designers and web developers to develop university websites that is suited not only, for Asian countries but also for other countries as well. The usability design framework provides a set of guidelines for implementing usability and cultural marker features in any university website design.

KEYWORDS: Website Usability, Cultural Markers, Website Design, Usability Design Framework.

INTRODUCTION

Website usage have become a common phenomenon globally to fulfil different objectives and purposes. Essentially, a website is a collection of pages and documents that may contain text, graphics, information and images [13]. The design and performance of websites is different from how websites were back in the 1980s [23]. Regardless of the differences, one thing that remains constant is websites should provide good performance, ease of use and intuitive experience for the users [13]. Websites that fail to provide such benefits to users would not be able to maintain or even attract visitors. Among the different type of websites available, one of the most widely accessed is a university website. An academic website is categorized as an institutional website for colleges, schools and university [22]. For every academic institute, especially universities, a website is its "virtual face," or the face it has chosen to present to the online world, including potential and current students [21]. A study conducted by [18] evaluated several academic websites to determine the overall effectiveness for users. They found that the basic design of the main homepage coupled with poor navigation, links, colors and fonts can decrease the overall usability of the website for users [18].

Recently, an article examined how international students select their preferred university and revealed that the main source of influence for the student's selection is through the university [33, 28]. Another perspective that has recently appeared in the last few years is that balancing between cultural diversity and user preferences while designing a university website is important because more international students are interested in furthering their studies overseas [25]. Most of the current academic websites are based on the North American model which is a one-size-fits-all model, but people from different cultures communicate and interact according to their own culture [26]. The usability term in this paper can be defined as, "the ease of use and acceptability of a product for a particular class of users that carry out a specific task within a specific environment" [3]. The universal usability can be met when affordable, useful and usable technology accommodates most the global population [31]. To effectively meet such universal usability with the global population, an additional factor that directly influence the usability called "Cultural Factor" is introduced [9]. The cultural factors in a design process of a website increases the overall functionality and aesthetic perceiveability, as well as the quality of the website design [8]. The integration of cultural factors into the websites could accommodate the requirements of users with different cultural background, which must be considered while designing and developing websites [10].

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As mentioned earlier, academic websites are important in attracting people especially students and parents to further their studies in other countries. So, there are instances where an academic website could not attract students as the website design is unintuitive and does not suit suitable cultural norms [17]. Per se, this research aims to identify the cultural aspects that could affect the usability experiences of users from Asian countries specifically Malaysia and Pakistan. This paper is a continuation from our previous work on an initial design framework for university websites with further enhancements to the factors within the framework [30].

This paper consists of several sections which begins with an overall literature of existing research on culture and usability. This is then followed by the approaches that has been used to identify culture and website usability. In section 4, we briefly describe the methodology, initial results, initial framework as well as the developed prototype based on the framework. Next, we provide the evaluation results for the prototype and the finalized design framework for university websites. Finally, we provide our conclusion as well as the future work.

EXISTING LITERATURE ON CULTURE AND USABILITY

Culture

Culture can be defined as the characteristics and knowledge of a group with their specific language, belief, religion, cuisine and more [15]. When it comes to forms of culture, there is a large grouping of cultural influences which can be called as cultural identities. The word religion, ethnicity, nationality, race and language are examples of these cultural groups. Culture is more of the object or behavior that includes norm, values, belief or symbols. So, for this research, cultural difference is essential to be examined.

A culture in any country is made of many complex components such as the country's traditions, belief, language and environment. But, there specific rules and norms that makes the culture in each of these country unique [7]. This rules and norms also applies to website designs for different countries. In 2000, Marcus and Associates conducted a study by comparing different websites of companies around the world which found that it is necessary to develop multiple versions of websites in respect of cultural influences [35]. Another research by [39] applied a cross cultural analysis on McDonalds' websites to analyze the high context culture and low context culture. They found that websites in high context cultures differ from the websites in low context cultures. This result depicts that it is complicated to design a website for the global market, especially where a level of cultural awareness is required.

Similarly, when we see the cultural differences in website designs for universities across the world, we can clearly see how culture influences these websites. Some universities apply their internal university culture to the website designs and some universities prefer the culture of their country. In 2006, a study was conducted on differences and similarities on eight university websites in eight countries [6]. The research found that the designs of the university website vary across cultures, there are certain characteristics that occurs more frequently in each of the countries websites such as the use of more photos in website design in Sweden, more art in Greece, use of more animation in Malaysia and Ecuador, the use of pastel colors (colors with soft and light shades) in Japan university websites.

Usability

Usability refers to the ease of use of the product, system and any service available. There are several definitions available from different researchers on usability and web usability. In 1994, in[27] defined usability as, "a measure of the ease of the ease with which a system can be learned or used, its safety, effectiveness and efficiency, and the attitude of its users towards it". Another researcher, in[32] defined usability as, "combination of characteristics oriented to the user, which are: easiness of learning, high speed of user task performance, low user error rate, subjective user satisfaction and user retention over time". In [5] then defined usability as, "the degree to which user can perform a set of required tasks and it is the product of several, sometimes conflicting, design goals including: functionally correct; efficient to use; easy to learn; easy to remember; error tolerant and subjectively pleasant".

Web usability is defined as "the degree of ease with which users can complete various tasks using a website interface with which they are unfamiliar. Common tasks include: browsing and general site navigation, locating particular information, purchasing goods and services, submitting data via forms and participating in web based discussion groups" [1]. There are several usability guidelines available and defined, to design a usable web interface such as the Research-based Web Design and Usability Guidelines by the US Department of Health and Human Services [2]. As such, web usability is widely recognized as the most important requirement for user acceptance locally and globally. It is stated that the universal usability will be met when affordable, useful and usable technology accommodates the vast majority of the global population [33]. In order to meet this level of usability, a number of approaches has been used to identify both culture and web usability.

EXISTING APPROACHES TO IDENTIFY CULTURE AND WEBSITE USABILITY

Per a study by [38], a successful designed website is the one that have been developed within the local culture. The term, "culturability" (an amalgamation of culture and usability) occurs when culture directly effects the way a user interacts with the site. It was found that when a customer or visitor are more comfortable with the design and usability features are more satisfied with the website and revisit the website [2]. Another study related to the website satisfaction among residents of Asia, Latin, Europe, South America and North America by using the Hofstede's model [13] found different preferences for colors and navigation among users. Most of the existing research focuses on the website usability from the perspective of customer satisfaction, e-loyalty and consumer trust [19,16]. Cultural differences in web design have slowly become the focus for web developers in order to enhance the design strategies to target users in other countries [11,19,23]. Universities use websites as an advertising platform to appeal to local and international students [6]. Cultural differences have increasingly become an important issue where most of the existing research are focusing on the internationalization of website, localization, color preferences, language preferences, image modality and organization of the home pages on university websites.

As mentioned in the earlier sections, Faiolo and Sorin have studied the cultural factors in website designs through reference to the cross-cultural theory developed previously through needs, wants, preferences and expectation of different cultures by contributing to the culture factors [36]. Another researcher, in[20] applied Hofstede's five cultural dimensions against the requirement, metaphors, appearance, preferences, mental models and navigation of different designs. In another paper, in [9] evaluated the design elements with cultural quality in university website designs by randomly selecting 15 universities from parts of the world by using the 5 dimensions of Hofstede. A significant difference was found across regions when the websites are grouped together. Three different page layouts were found: 1) extended page layout to the entire screen design found on Europe-based websites, 2) centered aligned and top-to-bottom flowing page layout in Far East as well as Islamic countries websites and, 3) centered aligned page design is found on American website designs. The study also observed that there are incompatible cases with Hofstede's scoring method such as America, as the country differs from others and have only a student-focused quality website. It was then revealed that these differences could be a reason for universities to present only relevant institutional information that users want to have directly from the specific websites.

In several studies, it was found that cross culture web design is much needed especially with the expansion of globalization [37,28]. It is stated that in order to meet the needs of people from different cultures and the requirement of globalization, cross-culture models must be introduced to enhance the usability usage for people from different cultures. In [28], they highlighted on the North American Model web design that is used as one-size-fits-all. They also stated that, despite of the use of this model, people from different cultures are still communicating and interacting per their own cultural interest via web pages to an extent. Such results from these existing researches has provided us with a strong purpose to develop a design framework that would fulfil different types of users worldwide.

METHODOLOGY, INITIAL RESULTS, DESIGN FRAMEWORK AND THE PROPOSED PROTOTYPE

Methodology

A quantitative research methodology is followed for the evaluation of the cultural marker and the usability features for the university websites. Two Asian university websites are selected for this purpose, one from Malaysia (UniversitiSains Malaysia) and one from Pakistan (Quaid E Azam University).

The websites are selected to evaluate and identify the usability and cultural marker features among 60 respondents from both Malaysia and Pakistan to design the initial design framework [30]. The questionnaire comprising of the five likert-scale questions was designed followed the previously available questionnaires, WAMMI (Website Analysis and Measurement Inventory) and WEBUSE (Website Usability Evaluation Tool) [4,12]. The questionnaire is divided into two parts, 1) personal information and 2) usability and cultural features.

The usability features that have been selected for the evaluation at the initial phase are: Availability, Learnability, Directionality, User Satisfaction, Compatibility and Number of Pages. While, the cultural marker features selected for the evaluation are: Color, Language, Layout, Images, Content, Attractiveness and Navigation.

Summary of the Initial Results

The participants from both Malaysia and Pakistan had evaluated two university websites from different countries. The university websites have been categorized as 'Website A' for UniversitiSains Malaysia and 'Website B' for Quaid-i-Azam University. The results shown here has been separated into two sub-sections for each group of participants. Each of the website evaluation is based on the usability and cultural markers features identified earlier.

Under the Availability feature (Usability), there are 9 components which was evaluated: admission, course information, hostel and accommodation, news and events, campuses, faculty information, school information, registration and lastly required information. The Cultural Marker features on the other hand has 7 main features with the Content feature having 12 components listed under. Table 1 highlights the overall initial mean results for each of the features in comparison to the websites. A mean value that is higher than a value of 3.50 is categorized as Difficult while a value higher than 4.00 is considered as 'Very Difficult'. Any value lower than 3.50 is classified as Average or Easy. The darker column represents the results from the Pakistani participants while the white column represents the Malaysian participants.

Usability Features

For Website A, both participants from Malaysia and Pakistan found the website to fall in the Average range for the Availability feature. Some of the components in that feature was also found to be Difficult such as the accessing faculty information, faculty information as well as the hostel / accommodation information. When it comes to the other features, the Compatibility, Directionality and Learnability was found to be Slightly Difficult for both group of participants.

For Website B, the participants found the website to be Average in nature when it comes to Availability. But, there are also two components which are considered Difficult (hostel/accommodation and online registration) under the Availability feature. Besides that, there are two features that was found to be Difficult (Compatibility and Learnability) while the rest of the features are considered Average by both groups.

Cultural Marker Features

Most of the participants rated Website A as Fair in most of the components under the Content feature. But, the rest of the features was rated as Average by both group of participants. But, there is a feature that is rated as Difficult by the participants which is the notification of links that has been accessed. It seems that Website A does not provide some visual guide of whether a link has been clicked by the user or not.

For Website B, it was a different outcome. Under the Content feature, most participants found that the website performed Poorly in general. But, the website seems to be on par with Website A with the other features. The only feature evaluated as Difficult was the notification of links that has been accessed.

Additional user feedback for both websites

The participants found that Website A should focus on providing information that users would find useful such as additional information on courses and reducing the overall pages on the website. Besides that, the developers should provide links that support language translation especially for international students.

Regarding Website B, the participants would like a less crowded website that focuses on attracting users to the website with essential information. Besides that, they would like to see more images and information relevant to research as well as scholarships / funding for potential international students. The dropdown menu for the website should be also be improved to avoid excessive scrolling from the users. The participants also suggested for both websites to have lesser animation, utilize consistent theme and layout for the overall website design

Table 1:Initial results of Website A and B from Malaysia and Pakistan participants

Features/Websites	Website A		Website B	
Usability (Mean values)				
Availability				
Admission Information	3.67	3.72	3.33	3.28
Course Information	3.43	3.72	2.51	2.68
Hostel and Accommodation	4.22	4.56	4.70	4.64
News and Events	2.73	3.24	2.52	2.80
Campuses	3.33	2.72	3.10	3.04
Faculty Information	3.67	2.04	3.78	3.08
School Information	3.68	3.84	2.88	2.52
Online Registration	3.23	3.81	2.13	4.24
Required Information	2.67	3.40	3.08	3.00
Learnability	3.50	3.68	3.87	3.52
Directionality	4.23	4.16	4.00	4.08
Functionality	1.14	1.20	1.02	1.12
User Satisfaction	3.46	3.12	3.09	2.48
Number of Pages	3.45	3.05	3.33	2.72
Compatibility	3.78	3.44	4.06	4.00
Cultural Markers (Mean values)				
Layout	3.06	3.32	3.66	3.70
Content				
Organization of content	3.00	2.88	2.96	2.52
Campus	3.52	3.52	3.72	3.64
Courses	2.42	3.55	2.92	3.58

Graduate	3.59	3.23	2.60	3.54
Undergraduate	2.72	3.66	2.72	4.20
Faculty	2.77	3.54	3.54	3.08
Admission	2.58	3.44	3.68	3.48
Registration	2.54	3.70	3.88	3.54
Supervisors	2.60	3.61	4.64	3.96
Research Activities	3.77	4.22	4.60	4.80
Hostel Accommodation	3.54	4.52	4.53	4.28
Updated Content	3.04	3.00	2.52	2.60
Color	3.60	3.02	3.60	2.44
Navigation				
Links	3.52	3.51	3.76	3.48
Number of windows	1.66	1.33	1.76	1.44
Images	3.70	2.88	3.80	2.22
Attractiveness				
Look and Feel	3.33	2.19	2.80	2.20
Interface Design	3.00	3.00	3.32	2.64
Language	3.10	1.67	3.36	1.88

Initial Design Framework

The initial design framework was developed based on the initial evaluation results. The initial design framework highlights the usability and cultural marker features that suited the participant's preferences [30]. The main reason of the initial design framework is it helps further to implement the evaluated usability and cultural marker features in the prototype. Furthermore, additional suggestions and comments gathered from the users during the evaluation phase would help to design a prototype accordingly. The initial design framework contains two parts as depicted in Figure 1: 1) The usability features that are preferred and evaluated by the users and would be implemented in the prototype, 2) The cultural marker features that are preferred and evaluated by the users and would be implemented in the prototype.

The first part of the initial design framework contains the usability features which are evaluated based on user preferences. The first characteristic, 'Availability' depicted in the usability features contains a number of different characteristics such as admission, course, accommodation, news and events, campuses, faculty, relevant school information and online registration information. Similarly, in the second part of the framework which contains cultural marker features have multiple number of characteristics evaluated under one feature. For example, the 'Content' characteristic is evaluated by combining the evaluation of different contents available on the websites. This includes the evaluation of organization of the content, campuses content, courses content, undergraduate and graduate school contents, faculty contents, admission, registration, supervisor information, research activities and relevant accommodation content. The 'Navigation' characteristic on the other hand, contains two types of questions which is 1) visited and non-visited links and 2) the number of windows opened when accessed. The other characteristics are as stated in Figure 1.

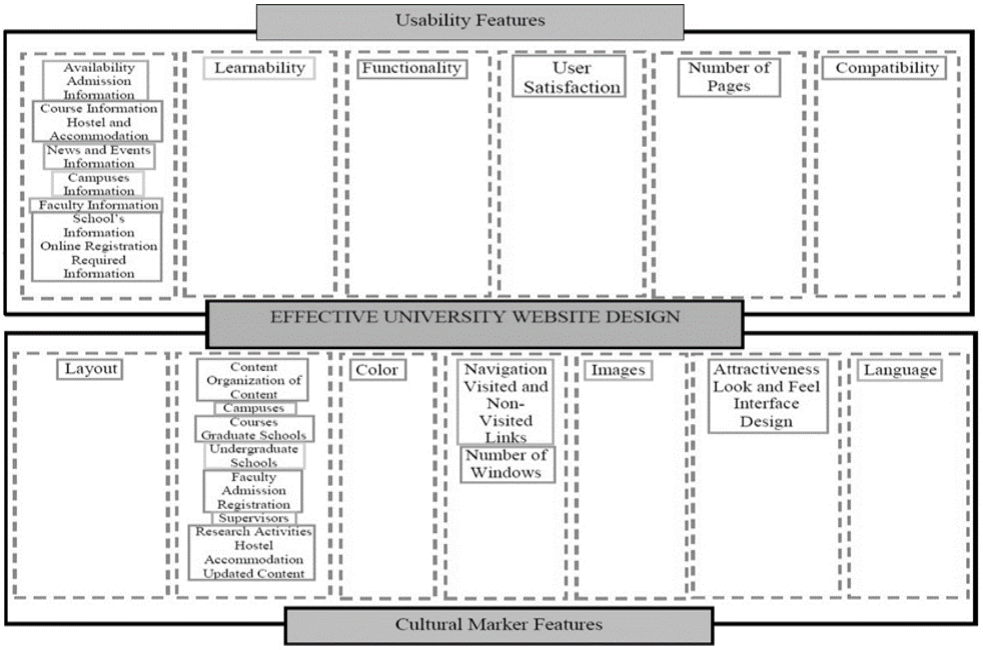

Figure 1: The initial design framework [30]

Proposed Prototype

The proposed prototype is based on the user's responses and suggestions gathered in the initial questionnaire survey that was conducted with 60 respondents [30]. The prototype is developed using the Meteor framework as it permits users to interact with links, content, navigation and to available information in the prototype. The purpose of designing this prototype is to provide users with a simulated interface for a university that is based on the initial survey result.

The home page of the prototype consists of seven parts that are designed vertically in a top- down approach. It allows users to scroll vertically rather than horizontally. The upper section of and the bottom section of the homepage is navigation bar and footer part that will be experienced in all the associated pages. The navigation bar contains the university name, a link for the home page, about us, contact us, FAQs, links to social networking websites and search facility. The navigation bar will be accessible to all the other pages in the website. A link is provided for demographic form in the navigation bar. Each participant was presented with a demographic sign up form to get participant information before filling the questionnaire and giving feedback about the selected features of the website. Three themes were designed and users could change the current theme and provide feedback.

These themes were designed to get the user's preferences regarding the website. The footer part in the website contains all the links related to the prospective student, current student, faculty, staff, alumni, friends and visitors as shown in Figure 2. These links are provided for the ease to go through any link related to mentioned categories. Other links in the footer included are copyrights, report security issues related to a website, privacy statement, site map and contacts. The next part below the navigation bar contains the university name and logo.

Figure 2: Footer design in the prototype

The next section under the university name and logo contains two main parts of the home page. One is the slider, which includes images and latest news of the university.

Another part at the left side of the page comprises of quick links. These links contain the main services provided by the universities. For example, in this prototype there are five links in the quick links section such as news, services, students, campus view and directories shown in Figure 3. The news is hyperlinked to the page related to university news archive. The service is linked to the page that contains the main services offered in universities such as medical, sports and transportation. For the Student link, it includes the online student portal, campus-online and student email login. The Campus view could include a brief view or map of the campus for visitors. The Directories are linked to the contacts of all the administration within the university, their email address, office address, emails and contact numbers.

Figure 3: Quick links design in the prototype

EVALUATION OF THE PROPOSED PROTOTYPE AND THE FINAL DESIGN FRAMEWORK

There are two types of evaluation involved in this research, 1) usability and 2) cultural marker feature's evaluation. The evaluation questionnaire consists of 26 questions: 1) eight questions are related to the usability testing, 2) 12 questions related to the evaluation of cultural marker features and 3) the other six questions are the general suggestions and feedback to get more insight into the participant's perception on the overall design. The questionnaire is designed by using the two previous identified questionnaires WAMMI, WEBUSE with some open-ended questions. Some questions are designed to get the participant's comments and open-ended discussion for the evaluation while some questions are designed with a 5-Likert scale.

A demographic form was provided to each user to fill their personal data upon their arrival for the evaluation of the prototype session. After filling up the demographic form, participants were provided with the description of research and required tasks for the evaluation. When participants completed the tasks, they were required to provide a feedback through the questionnaires. The participants could provide additional features that should be added to the prototype design. The additional features added to the prototype are based on the evaluation results and user suggestions. Previously evaluated usability features included Availability, Learnability, Functionality, User Satisfaction and Number of Pages. Additional usability features based on the initial survey results are added: Directionality, Readability, links, Online Registration and Consistency. For the cultural marker features, the evaluated components are Layout, Content, Color, Navigation, Images, Attractiveness and Language. Additional cultural marker features that was evaluated in the prototype are Organization and Text vs Graphics.

Proposed Prototype

Many participants wanted to see the main courses for the both undergraduate and postgraduate on the main page of the website. Participants suggested that they found the prototype very helpful in finding the desired course for undergraduate and postgraduate studies. From the initial analysis, participants had a problem in finding accommodations and hostels information in the website A and website B. As a result, we designed a link and information related to the accommodations, both within and outside of the university campus on the main page of the website. Most of the participants found it very easy for them to locate the information. Information related to the admission for both international and local students is provided on the main page for the user convenience where participants found it easily accessible. Most of the participants are satisfied with the information provided for the faculties related to each department and school as provided in the prototype. They found the interface much intuitive for them.Another important feature that has been identified is the consistency of the design and information. Consistency is identified from the open-ended and feedback questions such as, "Do you have any additional comments or questions?" and "What are the three things you like best about this website?".

In the previous initial survey that had participants reviewing existing university website from Malaysia and Pakistan, participants suggested that there should be a registration and payment section for users to enroll in the university. Based on that suggestion, an online admission section was designed in the prototype, and overall participants are satisfied with these links on the main page. For the color preferences, there was a high color suggestion from the participants. From the overall analyzed results and suggestion, 64% participants suggested a blue color, 61% suggested a green color and 58% was more for a white color to be added more in the website. The rest of the suggestion was a combination of different colors such as purple, pink, red, yellow and orange that should be made available on the website. Based on this result, we integrated the top color preferences in the prototype (aptly called Theme 2 and Theme 4).

For the spatial organization, most of the participants from both countries are satisfied with the spatial organization of the main page while some changes were suggested in the news section. The news section should be changed and arranged in a way that it would not take up the whole page of the website when accessed. Images in the news section must be changed to attract the users towards news of the web site and university. For the language preferences, each participant gave his/her opinion and suggestion to add the language in Asian university website. It has been suggested that all those languages that are being spoken and written in the Asian countries must be included in the website for the convenience of the users. E.g. Malay, Mandarin, Japanese, Urdu, Thai and English must be present on any university website in the Asian country. It is noted that the least number of participants are satisfied with the navigation style, most of the participants suggested changes in the navigation for ease of use. Most of the participants were comfortable with the overall look and feel of the prototype. Some participants suggested that they would like to see more images of the university students on the main page of the website. The participants also wanted to see more of a vertical scrolling instead of horizontal scrolling on the website. Another interesting factor found in our study was that participants want to see more graphics, animation and images on the website rather than text.

Final Design Framework

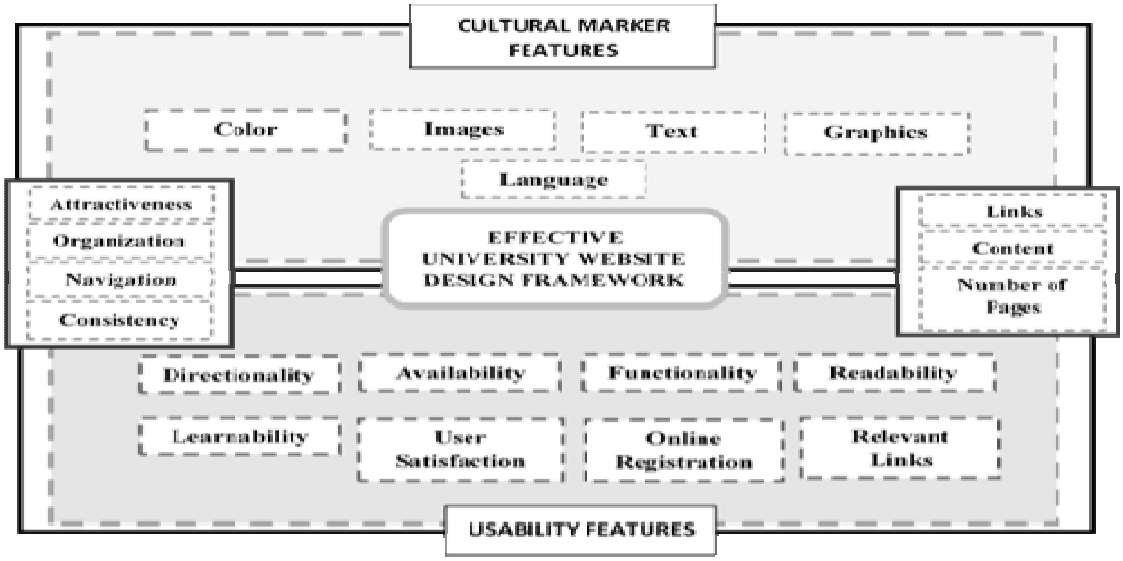

Figure 4: Final design framework

Based on the evaluation results of the prototype, the initial design framework has been improved. Figure 4 highlights the final design framework for university websites. The data collected were analyzed using the Statistical Packages for Social Science (SPSS) version 17.0. The study used both descriptive and inferential statistics. The descriptive statistics include mean and frequency. The inferential statistics include Pearson Product-Moment Correlation Coefficient analysis.

The designed framework provides a set of guidelines based on the mentioned features for the development of Asian university websites. The mentioned features in design framework, when implemented according to the student's requirement would help in increasing the usability with relation to the cultural markers. The framework is divided into two parts, the upper part contains the cultural marker features and the lower part contains usability features. The middle part contains those features which belongs to both usability and cultural marker features. This framework indicates the overall evaluated and identified factors for usability and cultural markers. The overall evaluated and identified features that effects the usability in the university websites are; Availability, Learnability, Directionality, Readability, Functionality, Online Registration, User Satisfaction, Number of Pages and Relevant Links. The overall identified and evaluated cultural marker features that effects the user preferences in university websites are; Color, Images, Language, Text and Graphics. Whereas, the third part comprises of identified and evaluated shared features that belongs to usability and cultural marker features are; Consistency, Content, Attractiveness, Organization, Navigation, Links and Number of Pages.

Availability is related to the available information provided in the website. This information comprises of the number of sections that have been studied in the first survey by user requirements. It has been found information related to these sections were lacking on the home page of the examined websites. This information is designed and provided on the home page in the prototype to check the user satisfaction through these given questions. Learnability shows the comments and suggestions from users to understand and get insight into how users are satisfied with the learning environment of the website. Directionality is related to the question of directionality of the web pages. It was examined in the testing websites that users do not feel comfortable while scrolling through pages. This question helps in examining the user's choice of scrolling the page, whether users are more comfortable with the horizontal direction or the vertical direction of the web page. Readability includes suggestions and comments related to the font sizes and colors during evaluation of a prototype.

Functionality contains the questions related to the functionality of the links provided in the prototype to see whether these links are functioning well. User satisfaction contains the questions related to the satisfaction of users from the overall performance of the website. Online registration facility is examined by checking the user responses against finding the online registration and admission. The links section includes the questions on the relevancy of the links if the given links are providing the associated relevant pages, if the links are working well. This section further contains the suggestions, comments and ratings.The color sections include the questions on the colors themes provided in the prototype and about the preferences of other colors if users want to see other colors on the website. Images include the questions related to the images given in the prototype to see what type of images users want to see on the main page. Language section is related to the language provided in the prototype that is "English", to see if users can understand this language, and also asked about the preferences for

other languages, what other languages users want to see on the university website. Text vs graphics contains the question to check if the user wants to see more graphics or text on the website.

As shown in Figure 4, there are a number of features that is shared between the usability and cultural markers areas. These shared features represent those features that are a part of usability and cultural markers. Consistency contains the suggestions and comments on the prototype to identify the consistency of design and information. Content is the main part of any university website. This is the main reason for visiting a website. Content includes the question to check if users are satisfied with the content organization, this section also contains the questions related to the relevance of information and updated information. The attractiveness section contains the question on the look and feel of the prototype. After analyzing the results of the prototype, it has been seen that when users asked about the best three things on the website, they rated the attractiveness features as the best such as, themes, structure, layout and organization of the sections. Organization section contains the questions related to the structure, layout and organization of the prototype. Navigation contains the question on the number of pages of the prototype, to see if users have to visit a several numbers of pages while navigating around. The links section is examined using the question related to the preferences of the users to see if Asian students and users want to see all the links on the main page. A number of pages is used to examine if the users have to visit so many pages when finding a specific search.

By analyzing both results from the previous survey and evaluation of the prototype, it has been found that users want to see the information available on the home page of university websites. In the beginning of this study, analyzing the results of tested websites, it has been found that users were not satisfied in finding the relevant information in less time. Malaysian university website provided the information of schools, faculties and courses in a nested manner. The user had to go to several pages to find the school information. In the Pakistani university websites, the interface provided a nested navigation structure for schools, faculties and courses. This nesting is not appropriate for users because many links are not visible to a user in the nesting format due to the height of navigation. It was found that most of the university websites in Pakistan do not provide information related to hotels accommodation and a section for international students. In the prototype development, it was made sure to include this information on the main page. In analyzing the prototype, users were more satisfied to find all the information available on the main page. For designing Asian university websites, it is important for designers to put all the students' related information in an easy manner without nesting navigation and providing nesting pages.

Learnability features are identified as the usability feature in the framework by analyzing a prototype results on the ease of use and learning of a simple design interface. It has been noticed that the university website must be simple and effective in design and functionality, the main reason is the users of the university websites are mostly students, researchers, faculties and other related authorities. They want to see simple and effective design because of the time. Time is the most important factor in visiting any websites. Complex website designs take more time to learn about the functionalities and links. By providing the FAQs in the website, it helps users to communicate to the handlers of the website and learn more about the university and website.

Users feel more annoy when scrolling up and down and from left to right. Most of the old websites had scrolling features, this explains the directionality of the web page. This feature is integrated into the framework because the usability of the website depends on the directionality. When the user finds more scrolling in the web page, they just leave the website, scrolling consumes more time of the users in looking and checking for the information. In the results analysis, it has been noticed that Asian users do not feel uncomfortable in searching information with vertical scrolling of the web page, but the vertical scrolling should not be exceeded and only important sections must be put in vertically. Such as, in the university website, it is very common and usable to put news and message from university superiors are placed in the direction of vertical scrolling. From the user suggestion and additional comments, it has been found that the readability of the text available in the website has the effect on usability.

Readability is included into the framework as usability features because it has been noticed that by integrating a text with the relative size of the web page can increase the usability. Setting a text size from 15 to 16 can be more effective for the users. Before uploading and deploying the website, the most important feature of the usability is to check the functionality of the website. Web sites are created by integrating the characteristics. These characteristics range from different features if one feature is failed, then the whole website fails to attract users. It is important to check if the links are relating the relevant information and to check if the buttons and other features are relevant to their information. When usability and cultural marker features are added to the prototype, it has been found that users are more satisfied with the overall look of the website. Adding simple features, information on the main page, colors preferred by users, easy navigation and finding information in less time increase the satisfaction.

Colors are identified as the most important cultural marker features by studying users' requirements in different cultures. Colors play an important role in attracting users across the globe as found in the evaluation of the prototype. It has been noticed that users found these different colored themes interesting to use. It is very effective if the designers provide this facility in the university websites. It is not easy to design a website with

the combination of colors for different cultures. Each culture has their own meaning and preferences for the colors, it is suggested in this research that instead of creating a one-color theme for different cultures, it is good to design different themes by studying the color preferences for targeted cultures.

Users highlighted that they wanted to see more images of university students on the website. The second preference is to see the university images such as buildings and architecture and third choice is to put country images on the university websites. Language is integrated as an important part of the cultural marker feature. It is very important to provide a translation facility to users when targeting multiple cultures through websites. Typically for an Asian university, the preferred languages are Malay, Chinese, Indian, Thai, Japanese and Urdu. Developers should provide the means to select the display language on the website. Another important feature identified for the cultural marker are text and graphics as most Asian users prefer more graphics in the website than text. Graphics must be integrated with the website so it does not affect the overall look and feel of the websites.

Shared features identified in the framework include consistency, attractiveness, organization, navigation, links, content and number of pages. These features were added to the framework as they overlap both the usability and cultural marker features. It is very important to maintain the consistency of the website in both design and information perspective. It has been noticed in the websites testing results that Pakistani website does not provide the consistent layout, alignment and design. Similarly, Malaysian university website failed to provide consistency in design elements and the structure of the websites. When users navigate through the website, they found very different associated pages with the change in colors, design, structure and navigation. Content is considered as the major instance and the reason to visit a website again. The content should be designed in precise, relevant and updated manner to allow users to visit the website again. Content helps users to maintain their trusts with the website. It is significant to put the information related to the figures, information, important dates and announcement in the more accurate way in any university websites. For the academic websites, the trust-building component is the accurate content of the web site. Attractiveness is added to the framework, it has been noticed that users found a website more interesting and usable if they are provided with the features that attract them. For example, in the designed prototype, users found color themes, navigation, links and quick links more attractive elements. Organizing information in sections in an appropriate manner helps to improve the effectiveness of the websites. It has been noticed in the surveys that users pay more attention to the organization of the sections. The designer must present the information such as header, footer, images section, quick links, the news section and main content in an organized way. It has been observed that the important sections of the website must be put in the middle of the page at the upper part. The other not so important sections can be placed at the lower part of the website for scrolling.

Another interesting finding in this study is to see several numbers of pages in the Malaysian university website. Users suggested that every university website could have fewer numbers of pages to improve the navigation around the website. Finding information by visiting fewer numbers of pages helps improve the usability of the website. Therefore, designers should avoid creating a maximum number of pages and providing the maximum number of clicks to the user to get the required information. The number of clicks and pages should be less. Most users wanted to see the maximum number of relevant links on the home page of the university websites to reduce the time for searching information. Several users suggested and commented to provide all the principal information of the university to be put on the main page

CONCLUSION

The aim of this study is to identify the usability and cultural marker features that would help us to propose a final design framework and designing a prototype that would suit the preferences of the users from different cultures. There are number of existing usability and cultural models available to evaluate the designs of the websites for specific users (localized design). However, a gap was identified in developing a design framework which comprises the integration of both usability and cultural features in a university website. Based on the results at the initial phase, the usability and cultural marker features are evaluated based on the user's responses on a Likert scale and a prototype was developed. An evaluation of the prototype has led us to the developed a more comprehensive web design framework that could be implemented in future university websites.

The future work related to this research would involve university websites from more countries. This work can be expanded to design frameworks for European countries and make the comparison of European countries framework with Asian countries university websites framework.

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