EVALUATION OF LOCALIZATION FOR E-LEARNING WEBSITE: A PRELIMINARY STUDY

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ABSTRACT. E-learning is an online system that allows users to plan, execute, and assess a specific learning process and as well as to maintain online collaboration over Internet. Bad interaction with e-learning websites make users feel inconvenient and too many of web objects on the user interface of an e-learning websites confuses its' users. The aim of this research is to determine the user's expectation in e-learning of comprehensive universities. Additionally, this research determines the localization of e-learning web objects based on selected comprehensive universities in Malaysia. A guideline for e-learning websites has been proposed based on the users' expectation. The proposed guideline was implemented to develop an e-learning website and the adapted website has been evaluated in order to validate the proposed guideline can be implemented in the development of e-learning websites.

Keywords: E-learning, Localization, User Interaction, Evaluation

INTRODUCTION

E-learning is an online educational evolvement based on advanced technology, which outperforms the traditional learning. E-learning websites are widely used nowadays by students and lecturers of comprehensive universities all over the Malaysia as blended learning purpose. User interfaces (UI) are given priority in website developments in order to maximize the user experience as its goal is to accomplish user goals through a simple and efficient user interaction. User interface design (UID) plays an important role in the development of e-learning websites as it can have leading effect on the success or failure of the particular e-learning as a whole. Localization should be concerned in the process of UID for a website. The process of adapting a product or service to a particular language, culture, and desired local "look and feel" is called localization. Localization for e-learning websites of selected comprehensive universities in Malaysia has been identified based on the users' expectation of 70 respondents through research. Aslina et al. was proposed guidelines for UID based on the users' expectation for the particular web objects of e-learning websites. This present research is the extension of previous research. The proposed guidelines in Aslina et al. have been used to redesign an existing e-learning system. The adapted interface has been evaluated in order to justify whether the proposed guidelines can be preferred in the process of designing a UI for e-learning websites.

RELATED WORKS

E-learning is distance education through remote resources. According to Lee and Lee, it is an online education well defined as the self-paced or real-time delivery of training and education over the Internet to an end-user device. E-learning is an emerging online learning platform in recent days. The e-learning process is inspired by the human factors and cognitive factors. Web-based learning environment can perform as motivational, instructional, modeling, feedback, and assessment tools to the e-learning process. Usefulness of e-learning has drastically increased within the last few years.

UI is very crucial as it enables interaction between users and computer software. UID determines the chances of easily using and learning software. UI is vital in e-learning as e-learning has become a popular online blended learning system among students and lecturers in comprehensive universities. The purpose and goal of the e-learning could not be achieved if the website is unsuccessful in the way of UID, even if the educational content is good enough and the users are keen to learn. Barzegar et al. were stated that the bad interface of UID parameters drains less interest of students. Therefore, a good UID is required for a successful e-learning website as it enables a better user interaction. User friendliness is a vital aspect need to be dealt with in raising the usability and effectiveness of e-learning UI. Park and Song used Maier and Fadel's Affordance-Based Design methodology as a framework in their research and have identified affordance factors, suggested affordance design strategies for the UI, and redesigned an affordable user interface prototype. The researchers reviewed and validated the identified affordance factors and strategies in Delphi meeting whose members were teachers, e-learning specialist, and educational researchers. The impacts of the redesigned UI on usability were evaluated by fifth-grade participants in an experimental study. And as for the result, all those participants experienced positive emotions and used the interface effectively, efficiently, and satisfactorily. The e-learning interface design should be central, fundamental element of the overall design of online units as they are determined from the way people learn and the tasks they perform and there is a no role of the technological concept. For that reason, the design of the layouts can influence the students' learning way and their interaction on a particular unit.

Arockiam and Selvaraj declared that the effective UID aiming to efficient environment for the user to successfully navigate, understand and learn the content of the e-learning process as the quality of the UID directly impacts the way the learner interacts with and processes the information presented in the UID. According to Shneiderman, website designers and developers should have a detailed understanding of the prospected users of the website they are developing, which includes profiles of their age, sex, physical abilities, education, cultural or ethnic background, motivation, goals and personality. Therefore, the UI may only be functional to a specific group of users. According to Faghih et al. the UID process covers four distinct framework activities, which include user, task, and environment analysis and modeling, interface design, interface construction and interface validation. Whereas, Clark et al. stated that cognition, content and form are the three major factors that influence the complexity of a design if UI as well as indicates how users perceive a web page, the location of the content at that web page, and the way in which the web page is developed. Ahmad et al. were study on Adaptive User Interfaces (AUI) for intelligent E-learning. According to them, adaptive UI offer incredible educational prospects by eliminating temporal and spatial constraints besides contributing personalization and interactivity. Therefore, UID is very crucial for a successful e-learning.

E-learning localization is the process of adapting the learning content to a particular language, culture, and desired visual and sensual look and feel, which will appeal to the target learners. Localization is one of the important aspects to be given priority in the development

of web UI. Web or web-based application design needs to consider its' culturally diverse user group as the sharing of social experiences and interactions takes place over the global platform of the Internet. Cyr and Trevor-Smith was declared six vital characteristics that need to be concentrated in the cultural context for the design of the UI of a website. Characteristics need to be considered in a cultural context are language, layout, symbols, content or structure, multimedia and color. Language is the distinctive aspect of culture as it is the building block from which users gain information from a website. Web pages will have more than one language version in order to internationalize the particular website. The users access to the content of a website and their user experiences increases when the website is in proper manner as well as culturally sensitive. Besides language translation, time zones, currency, local color sensitivities, product or service names, gender roles, and geographic are the aspects needed to be given considered while localizing a product or service. Localization of UI aims to provide a "technologically, linguistically and culturally neutral platform from which to launch global e-commerce initiatives while allowing a framework that incorporates local content and functionality". According to Aslina and Azizah, ordinary user's mental model need to be understood for localization of objects on the web UI as it is the key requirement in the development of a website. Aslina and Azizah have done a research on the expected location web objects for informational websites and have proposed a few guidelines to be used for UID practices of informational websites. Localization in UI is important as it increases the users' concern on a particular website.

USER INTERFACE DESIGN

The UI of an existing e-learning of Universiti Malaysia Sabah, which is known as Smart2ums, has been redesigned in this research based on the proposed guideline in Aslina et al. . Aslina et al. was proposed guideline for UID of e-learning websites based on the study conducted with 70 participants. Figure 1 shows the proposed guideline:
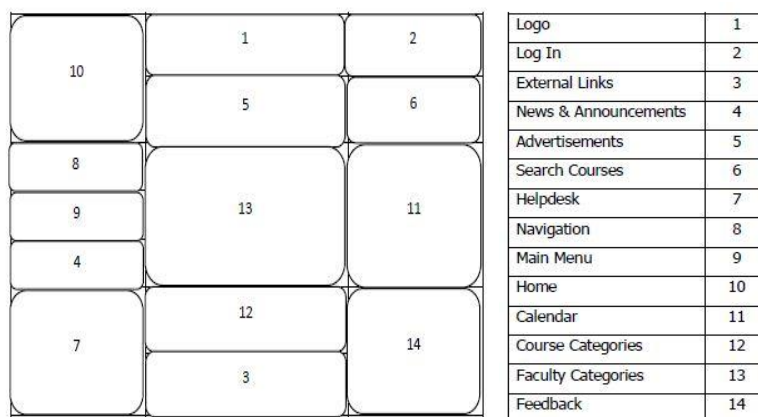

Figure 1. Localization of Web Objects for E-learning Website.

Smart2ums has been chosen to redesign and develop as a prototype in this research. Cultural dimension based on Hofstede was considered while developing the prototype (Table 1). A total of 14 web objects have been added to the redesigned UI of Smart2ums. Ten web objects were the existing web objects, whereas the remaining four web objects were the new objects contributed to the Smart2ums, which are Calendar, Course Categories, Faculty Categories, and feedback. Figure 2 shows redesigned user interface of Smart2ums based on the guideline as in Figure 1. Figure 2 and 3 show the example of redesigned UI based on the

guideline proposed in Aslina et al. [3]. The user interaction with the adapted UI has been evaluated to confirm the proposed guideline for e-learning websites.
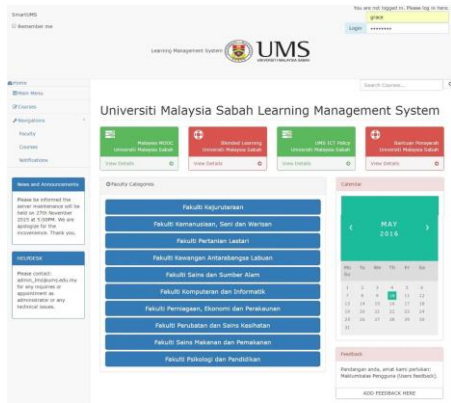

Figure 2. Adapted Smart2ums Based on Proposed Guideline.

Figure 3. Adapted Smart2ums Interface upon Log In.

Table 1. Cultural Dimension of Malaysia According to its Rank and Score

Power Distance	1. Linear navigation, few links, minimizes navigation possibilities. 2. Structured data. 3. Reduced choice of functionalities. 4. Little information at first level. 5. Images show people in their daily activities.
Individualism vs. Collectivism	1. Traditional colors and images. 2. High image-to-text ratio. 3. Colorful interface.
Uncertainty Avoidance	1. Most information at interface level. 2. Complex interfaces. 3. Non-linear navigation.
Masculinity vs. Femininity	1. Little saturation, using pastel colors. 2. Allow for exploration and different paths to navigate. 3. Personal presentation of content and friendly communication with the user.

EXPERIMENTAL SETUP

To conduct the evaluation of new layout, Camtasia Studio Version 8.6 was used to evaluate the layout. This software allows its user to record the screen movement of the personal computer or laptop. Through this software, two different slides show were made consist of the new layout and existing layout of Smart2ums. The existing layout was current Smart2ums and the new layout is the adapted layout according to the proposed guideline. During the slide show, instructions were given to respondents asking respondents to find web objects in the new UID of Smart2ums. The same process was implemented in evaluating the existing layout. Then, the movement of the cursor when respondents select the web object as instructed was recorded using Camtasia Studio Version 8.6. Each respondent was asked a set of demographic questionnaire. The questionnaire was distributed to 10 respondents for analysis. There were four males and six females of the respondent. The age of the respondents are varying from 20-29 years old. The respondents were asked to answer their ethnicity, which among the

ethnics are varying among Malay, Chinese, and Sabahan ethnics (Bugis and Dusun). Most of the respondents are among undergraduate students of UMS (Bachelor Degree). All the respondents were selected randomly to complete the evaluation.

RESULTS AND DISCUSSION

The result of the evaluation using Camtasia Studio Version 8.6 has a ratio of 7:3, where the seven are having shorter time in selecting web objects of the new layout of Smart2ums and the three in the ratio are the longer time in selecting web objects during the evaluation. To avoid bias in evaluating both of the layouts, the first five respondents were asked to evaluate existing layout of Smart2ums then followed by new layout of Smart2ums. Then, the next five respondents to evaluate new layout first then followed by the existing layout of Smart2ums. The order of the web objects for respondent to select during the evaluation were also mix and not have the same order. The time taken in the table is read as minutes: seconds: milliseconds. The result of time taken for respondents to select web objects were as follow:

Table 2. Result of Time Taken of Evaluation of the Layout

Respondent	Existing Layout (m : s : ms)	New Layout (m : s : ms)
1	**01 : 26 : 27**	01 : 57 : 11
2	02 : 05 : 06	**01 : 31 : 21**
3	03 : 45 : 08	**01 : 15 : 29**
4	01 : 37 : 22	**01 : 31 : 23**
5	01 : 43 : 03	**01 : 40 : 00**
6	01 : 49 : 18	**01 : 33 : 01**
7	**02 : 32 : 13**	04 : 25 : 14
8	03 : 00 : 25	**01 : 53 : 20**
9	**01 : 30 : 22**	02 : 05 : 27
10	01 : 37 : 28	**01 : 32 : 05**

As from the Table 2, most of respondents need shorter time in selecting web objects in the new layout of Smart2ums. This means that the web objects in the new layout are easier for the respondents to use, convenient, user-friendly, not a complex interfaces and simple. Respondents were also interviewed, which between the two UID are easier for them to use, most of the respondents answered the new layout of Smart2ums. Thus, the UID for the new Smart2ums are much more compatible for the user to use than the existing layout. Furthermore, respondents find that the new layout are much more user-friendly as the web objects are more organized and easy for them to select and choose.

CONCLUSION

Since, the majority of the participants have shown a positive interaction with the adapted Smart2ums, which was redesigned based on the adapted proposed guideline, the proposed guideline has been justified to be used in UI development practices for e-learning websites for comprehensive universities. The user interaction evaluation has proven that web developers and designers can refer and use the adapted proposed guideline, while developing e-learning websites. In conclusion, the new UID using the adapted proposed guideline is effective as it is very user-friendly. Most of the web objects are structured and well organized as how respondents want it to be as they participate in both questionnaires and evaluation. There is some web objects were added to the Smart2ums but it is well organized to make user easy to

find information and details they need. Apart from that, using the cultural dimension checklist, this research shows how the Malaysian UID is by culture. After confirming using the checklist, it is indeed the culture in Malaysia affect the UID. There are varying of culture in Malaysia, so this checklist has a clear view on how each dimension describes how the UID in Malaysia works. Therefore, through this evaluation, the objective of this study were achieved which is to prove the validation of the adapted proposed guideline based on localization in developing an e-learning website.

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