A Comparative Analysis on Web Heuristic Usability between Thai Academic Web Sites and US Academic Web Sites

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ABSTRACT

Usability heuristics for the Web is one of usability techniques used by Web designers as guidelines in designing usable Web sites. This preliminary study aims at evaluating and comparing Web heuristic usability between Thai academic Web sites and US academic Web sites using the Web usability checklist modeled by Keevil and Associates. Four public universities from both countries were evaluated for usability. The authors hope to obtain some hidden ideas of cultural aspects that may impact on Web designing and heuristic usability issues that need further research. Future studies will focus on specific factors in more detail.

Keywords: Web usability, usability checklist, usability heuristics, usability index, usability guidelines, cultural issues, Web design

1. INTRODUCTION

The number of Web sites and users in the Internet is increasing rapidly. Successful Web site development becomes the significant issues for researchers and companies. GVU’s 1998 survey showed that Web designers were from different backgrounds, expertise and experiences [17]. As they are always under the rush situation to produce Web pages, the qualities of Web pages are varied. Consequently, the Web design principles are needed. More information showed that almost 90% of them used Web page design principles as guidelines [17]. However, the survey also stated that the guidelines were too general for designers to apply [17]. This preliminary study aims at evaluating and comparing Web heuristic usability between Thai academic Web sites and US academic Web sites to investigate the current practices in Web usability between two countries. The author decided to start with a heuristic evaluation of academic web sites. Four public universities from both countries – two Thai University Web sites and two US University Web sites were evaluated. Several Web usability principles or guidelines are provided in many Web design books and Web sites. In this study, the Web usability checklist modeled by Keevil and Associates was chosen because it was combined several existing sets of guidelines [10].

2. RELATED RESEARCH

2.1 WEB USABILITY

The “Lost in the space” or so-called “disoriented problem” is a common problem found while surfing the Internet [4, 14]. It is also related to another major problem called “cognitive overload” since users need to perform several tasks simultaneously while navigating web sites such as seek specific information, traverse to many Web pages, read or scan to understand information [4].

Together with the network delay problem, Web users waste their time and feel disappointed. Moreover, these can cause the negative images toward Web sites and companies. To overcome the disoriented and cognitive overload problems, it is the responsibility of Web designers to produce Web pages that are usable, easy to learn, to remember and pleasant to use. Researches show that providing users with effective navigation aids can significantly reduce these problems. Apart from navigation aids, many Web interface design issues have been studied and found the significant impacts on improving ability of Web users in navigating through Web sites.

Besides, Web designers need to keep in mind that types of Web users are varied. They might be from other countries that do not use English as the main language and have different cultures. They might be computer novices or computer experts. Also, they might be frequent users or they might be occasional users. Moreover, some Web users might navigate the Web sites without a particular goal but some have their goals in mind. Experiencing with difficulty in finding particular information of Web sites is a usual problem. Further, with the availability of search engines and portal web sites, some Web users navigate Web sites from other pages, not from the homepages. Losing in the Internet always happens. Therefore, Web designers must apply the Web usability concepts that can be applied from traditional usability engineering to design usable Web sites. Usability in general refers to the characteristics of user interface that is easy to use, learn, and remember, pleasant to use and have least errors [13]. Two major usability techniques are user testing and usability heuristic evaluation. This paper will only focus on heuristic usability evaluation.

2.2 HEURISTIC USABILITY GUIDELINES

The terminology, “heuristic evaluation” is originated by Jakob Nielsen [13]. In terms of interface design, heuristic evaluation is performed by user interface (UI) experts based on their knowledge, experiences and heuristic guidelines. Applying with Web usability, heuristic evaluation can be performed by Web designers themselves by mainly following the Web design principles or guidelines. It is considered as the least expensive but most useful [1]. These guidelines are from designers’ personal experiences, observations and some from empirical researches. One study stated that Guide to Web Style, by Rick Levine from Sun Microsystems and the Web style guide from Yale are the most comprehensive guidelines [1].

Jakob Nielsen, the usability guru, proposes many practical guidelines for designing Web pages based on his usability experiments. However, one study argues that some of these guidelines are not practical for novice or intermediate designers, not only in US but also in other countries, which almost of them.
have not enough resources to conduct usability evaluation [1]. Therefore, the guidelines should be based on traditional user interface guidelines, simple and practical for Web designers with different backgrounds and Web designing skills to understand and apply [1]. A number of researchers studied on evaluating Web design guidelines. Preece stated that substantial expertise in UI design is needed in persons who evaluate guidelines [15].

Moreover, to evaluate guidelines, one should conduct the design based on test guidelines and observe its result, which based on the particular setting. Spool and co-authors investigated about Web usability factors that actually work at seeking information on Web sites [16]. Gehme and Turban also studied on the most important Web design recommendations to produce e-commerce Web sites [6]. Grose and co-authors conducted a series of studies in comparing using Web design principles and traditional user interface principles to design Web sites [7]. Interestingly, they concluded that Web guideline authors were likely to less refer on traditional user interface design guidelines. Many researchers revised the existing guidelines and proposed their own guidelines after they conducted heuristic evaluation [1,18]. Recently, Zhang and Small proposed the theoretical framework for designing Web sites based on Herzberg's motivation-hygiene theory [20]. This framework presents many aspects and successful factors in developing Web sites rather than emphasizing only the elements of interface design. It is important that Web designers should apply the available guidelines carefully, wisely and appropriately for particular purposes and context of the Web site.

2.3 CULTURAL INTERFACE DESIGN

2.3.1 WHAT IS CULTURE: Even though, no current evident is shown that cultural factors affect web design and web usability, the author believes that, in some certain levels, web designers produce their web sites by their patterns of thinking and preferred styles, which are derived from their cultures. Similarly, web users from different cultures might have different concepts of what are useable to them in terms of web navigation. To support this idea, for instance, the same products sold in different countries or cultures have been modified to suit their target users who have different life styles, habits, languages, thinking patterns and more. A recent real-world practice in terms of suitability of characteristics of products for each particular country is the Japanese animation, "Pokémon", which is extremely popular in US kids nowadays. As cited in the recent TIME Magazine, many changes have been performed in the Pokémon US version, comparing to the original Japanese version [3]. For instance, the names of the characters and monsters were changed e.g. Satoshi became Ash. As shown, the meaning of culture is significantly broad since cultures are embedded in human being lives and minds. Culture can be defined as beliefs, values, norms, races, behaviors, thoughts, languages, and feelings [2,12,19]. People from different countries communicate with different languages and have different cultures that make them perceive things differently.

2.3.2 CULTURAL LAYERS: One study presents two layers of culture, namely, the objective culture and the subjective culture [8]. The objective culture contains cultural elements, which are visible, tangible, and easy to examine and understand, such as, colors, graphics, sounds, arts, and literatures. This layer can be changed from time to time. In contrast, the subjective culture is invisible and substantially difficult to examine and understand since this cultural layer deals with beliefs, values, and behaviors outside conscious awareness, such as, a sense of time, personal space, a sense of group belonging, and seniority.

2.3.3 CULTURAL MODELS: Cultural models are used in many different purposes, namely, to classify the cultural variables, to identify cultural biases, to identify the similarities and differences between two or more cultures. Several well-known cultural models have been developed and utilized in various areas of studies such as organizational behavior, social communication, social sciences, and information sciences. Edward T. Hall, David A. Victor, Geert Hofstede and Hofstede are well-known cultural model developers. Edward T. Hall's cultural model used in terms of intercultural communication includes speed of messages, context, space, time, information flow and action chains. David A. Victor's cultural model is also used with intercultural communication, particularly in business contexts. This model includes language, environment, technology, social organization, context, and other aspects of communication.

2.3.4 CULTURAL IMPACTS IN COMPUTER AND HUMAN INTERACTION: One study proposed a classification model of human-computer interaction modes in relation to cultural impacts [9]. Two modes include the listening mode and the speaking mode. The listening mode, in which users are presented with information from computers, contains three phases, namely, the perception phase, the association phase, and the reasoning phase. In the perception phase, users become aware of presentations of interface elements on the screen such as colors, shapes. Cultural factors very slightly affect users in this phase, whereas, cognitive aspects significantly influence design considerations. In the association phase, users relate those objects with symbolic, semantic, and cultural representations with semantic meanings. For instance, users understand that the presented message is English content and its red color can be interpreted as a warning message. Cultural factors play a more important role in this phase. In the last phase, the listening mode, the reasoning phase, users relate the presented information or objects with their logical rational. Cultural background underlying users' rationales greatly impacts how users think and perceive.

Another mode of human-computer interaction is the speaking mode. This mode where users give instructions to the computer contains four phases, namely, the affordability perception phase, the applicability check phase, the enactment with expectations phase, and the confirmation phase. In the affordability perception phase, users identify possible actions to interact with the presented information. The cultural impacts in this phase are not significant. In the applicability phase, users identify possible actions to interact with the presented information. The cultural impacts on the results of the applicability phase of the listening mode affect user attitudes in the validation process. The enactment phase is the phase that users actually conduct the desired actions on the particular object. The cultural factors almost in terms of language differences, might affect how the enactment process is indicated to users, sentence structure.
2.3.5 CULTURAL IMPACTS IN INTERFACE DESIGN: Some empirical studies on the objective layer of culture (e.g., colors, graphics) in interface design have been conducted. The outcomes result in several proposed guidelines in interface design of international software. Fernandes [5], for example, proposed nine principles in designing global user interface, namely, (1) designing a global base, (2) providing the correct language, (3) considering physical variations, (4) translation of visual elements, (5) supporting native formats, (6) employing appropriate and familiar objects, (7) concerning cultural blind spots, (8) removing taboos and employing appropriate symbols, and (9) presenting users with culturally appropriate aesthetic elements. However, studies on another layer of culture, the subjective culture, are also necessary since beliefs, values, tastes, and the history of the user’s culture can influence human interactions with computer technologies. Without these concerns, successful human-computer interface design cannot be achieved [9].

3. METHODS

1 MATERIALS
Two public Thai academic Web sites and two public US academic Web sites were evaluated for usability. Thai academic Web sites included Chulalongkorn University (http://www.chula.ac.th) and Prince of Songkla University (http://www.psu.ac.th). Two US academic Web sites included Iowa State University (http://www.iastate.edu) and University of Wisconsin Madison (http://www.wisc.edu). The author preferred to abbreviate Chulalongkorn University web site as the CHULA web site, the Prince of Songkla University web site as the PSU web site, the Iowa State University web site as the IASTATE web site, and the University of Wisconsin Madison web site as the WISC web site. In this study, the CHULA web site was chosen since the Chulalongkorn University was the oldest university in Thailand. The PSU web site was chosen because it was the originated place of the Internet in Thailand. The author had no particular reasons in choosing those two US academic web sites. They were randomly chosen from the YAHOO web site (http://www.yahoo.com).

2 TOOLS
The Web checklist modeled by Keevil & Associates was used to measure the usability indexes between Thai academic Web sites and US academic Web sites [10]. The checklist was categorized into four major sections, namely, finding the information, understanding the information, supporting user tasks, and presenting the information. It was the only one Web heuristic checklist that each guideline was presented as Yes/No question, which was less bias and more consistent when only one evaluator testing a Web site. Even though the checklist was not concise, it was the most appropriate in this study since it can cover several aspects of web design. Moreover, it was manageably that evaluators were allowed to add or delete guidelines according to appropriateness of the study. Hence, the original checklist was modified by adding and deleting some usability questions to fit with the purpose of the test Web sites. Added guidelines were summarized from several guidelines provided by well-known Web designers and Web usability gurus such as Jakob Nielsen, IBM and Sun Microsystems. Since the test web sites were considered as large-scaled web sites, which contain several sub-sites such as the department web sites, the analysis was concentrated on the main page of the university web site and three or four steps away from that main page. The comparative data was used to determine current practices and usability factors that influence the design of Thai and US academic Web sites that need further research. Furthermore, the authors hope to obtain insights into hidden factors of cultural aspects that may affect Web design styles in Thai academic Web sites. The author will conduct follow-on studies on the significant issues that have been found in this initial research.

4. DATA ANALYSIS AND DISCUSSION

4.1 Usability Similarities and Differences
The similarities and differences in usability practices among the Thai and US web sites are discussed in detail. It is necessary to clarify that this comparative study is not aimed at identifying which web site is good or bad. Rather, the author has a belief that the web designers produce their web sites based on some certain levels of usability concerns and several possible reasons, which make them unable to cover all usability issues. Especially, for Thai web sites, many rationales in designing web sites are needed to understand. The author believes that the cultural backgrounds of the designers are one of several factors that influence the web design styles. Violated items found on this study might not be considered as unusable items in the Thai designers’ and Thai users’ point of views. Future studies will focus on specific factors in more detail.

Figure 1 Overall usability index
However, this will be more effective if the frequency of questions is only relevant to particular pages, as users expect to receive the answers for their particular problems. For example, FAQ for admission should be shown only in the admission page.

The “presenting the information” section contains several usability issues, namely, display size, links, HTML formats, international format, text format, visual design, mechanics, lists, and printings. The US web sites have higher scores in usability than the Thai web sites in this last section of the study (see Figure 5). Thai web sites have page loading speed problems due to the gateway network connection between Thailand and US. Unfortunately, it is also found that Thai web sites have vivid usability issues of aesthetic and minimalist designs in which, for example, the graphics bigger than 25K, meaningless and redundant graphics, and several animated graphics included in the designs. Besides, Thai web sites have been also been reported using frames, even though frames are recommended avoid using because of its common problems, unchanged URLs, which make bookmarking difficult, unsupported-frames browsers, printing problems. Frames might be used if it can effectively make navigation simple. However, the web sites should provide a without-frame choice as well.

Moreover, both Thai and US web sites do not concern to indicate screen size and “Best view with the browser” information to users. In terms of links, Thai web sites do not use the consistent colors of links in each major page, which might make users confused on what they have already visited and not yet visited. Moreover, they use confused wordings and informal abbreviated wordings such as “AdminOffice”, “HallOfFame”, and “International”. Also, both Thai web sites do not provide descriptive information for links that are difficult to recognize. Rather, they provide long descriptive links for those problematic links. Nevertheless, one study argues that providing a high density of self-explanatory text links can facilitate successful navigation.

Further, the PSU web site uses embedded links or links that surrounded by texts, which require users to read extensively. US web sites provide well-descriptive links. However, it was found that the WISC web site uses wrapped links or the links that wrap across more than one line. These links might not be much problematic since white spaces are used to separate each link away. In general, all text web sites use effective text formats, for instance, figures and tables aligned correctly, white space used as necessarily; information were chunked; and used links connect chunks. A few printing problems also have been found in Thai web sites such as not all the text and graphics in the same page are printed. In terms of international format, the US web sites provide only English content, whereas, Thai web sites are bilingual; they provide both English and Thai contents. Especially, in the CHULA web site, its sub-sites are also bilingual.

Several images in Thai web sites such as the antique hats of Thai dancers cannot be recognized by international users. However, it seems necessary to present these images on the Internet with the purposes of presenting Thai cultures and arts. A possible way to help international users understand these images is providing brief descriptions underneath the images or alt texts for each image. The text web sites are not intended to be designed for best fit with each particular target audiences from different cultures.

4.2 CULTURAL IMPACTS ON THAI WEB DESIGNS
This preliminary study is also conducted with an attempt to identify design differences between two nations, which might be influenced by cultural beliefs and values of web designers. Even though, some of these differences are considered as usable based on the usability checklist developed on US perspectives, user testing on Thai web usability is needed in order to verify the same outcomes. The possible cultural-influenced design elements identified in this study will be used to investigate usability for Thai users in further studies in order to prove the assumption (1) unusable interface elements in US perspectives might be usable in Thai perspectives; (2) interface elements influenced by cultural factors might support and be usable to users in particular culture; (3) design guidelines should be localized to particular cultures, and (4) design should deal with both objective cultural layer and the subject cultural layer in order to prove the recommendations of Ito and Nakakoji.

As described earlier, the major differences between Thai and US web sites found from the checklist are visual design issues. The web sites are designed by using many animated graphics, big sizes of graphics than recommended. Moreover, graphics tend to be used in every single page, even though they seem unnecessary in the sense of design for usability. However, there is no evidence that these undesirable interface elements are also unusable among Thai users. The Thai web designers’ design styles might be influenced by some certain levels of their patterns of thinking, which means cultural factors adopt the design. One of the cultural factors is aestheticism, which uniquely influences the hand-made crafts, arts, decorations on foods, and costume [11]. In addition, it is reasonable to assume that Thai aestheticism influence the designers’ considerations in using graphical elements in web design.

Several design issues that have been found in Thai web sites not from US web sites and have been related to cultural factors include:

(1) The Thai web sites include long descriptive “Historical information of the university in the university homepage and the school/faculty history in several school homepages. A powerful Thai word, “Butkhao”, shows a strong sense of meritocratic obligation among Thai people toward interpersonal relationships, institutions, religions and more from time to time [11]. By expressing the long descriptive “Historical information of the institutions through the web sites, people who belong to that particular institution can show their representativeness and a strong sense of obligation that denoted to their institution.

(2) The Thai web sites provide information including photos, names, last names and ranking positions and executive and administrative personnel in each organization unit such as executive administration and organization charts. Importantly, this information is formally organized in an order of ranking positions. Status positions, names, authority, seniority, etc. hierarchy are important cultural factors that orient Thai society [11]. In addition, it is important to present the information of important people in the organization.

This analysis conducted on only two Thai web sites, therefore, few obvious differences in comparing with US web sites are reported. With more web site analysis, the authors expect to find more differences and ensure the differences found in this analysis.
and US web sites. The biggest tendency is that Thai web sites may contain information that might be difficult to find, while US web sites are more intuitive. Site index, another navigation tool in finding information on the web, is not used in Thai web sites. Both Thai and US web sites do not utilize the usability guidelines in terms of the contents list and searching features. However, users did not have a success in using search functions in Thai web sites. All web sites were found providing navigation bar mechanisms. The Exit way such as “Home” button are provided in each page of the US web sites and the CHULA web site, not in the PSU web site. It is evident that users can’t find the way out when getting deep inside the PSU web site. By providing the exit way, users feel in control of the site and do not feel frustrated if they get lost. Nevertheless, the better way is providing the navigation path in each page to present where users are now on the web sites and allow users to step back easier.

All web sites have high usability scores in the “Understanding the information” section (see Figure 3). The major usability issues in this section include the organization of the site, style, and terminology. Both Thai web sites are not designed by applying the concept of “inverted information pyramid”, starting with the conclusion, and then the details. Moreover, the introduction parts are not informative. Further, the organizations of the sites are lack of consistency. Besides, Thai web sites have some language problems, such as, misspelling words, active and passive voice sentences.

Figure 4 shows the usability index in the “Supporting user tasks” section between the US sites since no user tasks are found on both Thai web sites. The task that commonly provided in any academic web site is an online application. By analyzing the usability of this task, the WISC web site is more usable than the IASTATE web site. Interestingly, the IASTATE web site, however, provides the FAQ information in every major page of the site such as FAQ for admission. This feature is very useful for the new users and it can reduce correspondences from users.
5. CONCLUSION

The evaluations and comparisons on Web usability practices between Thai academic Web sites and US academic Web sites by using the web usability checklist are presented in this preliminary study. Some problems in using this checklist have been found. It was evident that US web sites have higher usability indexes than the Thai web sites. As expected, it was also found that the web design styles between Thai and US web sites are different in terms of aesthetic issues and information provided such as "History" information and information of important people in the organization. It is possible that cultural beliefs and values of web designers influence these differences in some certain levels. Even though, some of these differences are considered as unusable based on the usability guidelines developed on US perspectives, Thai users might feel usable. The author will conduct follow-on studies on the significant issues that have been found in this initial research.

6. REFERENCES


