Cultural Prescription vs. User Perception of Information Architecture for Culture Centred Website: A Case Study on Muslim Online User

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Abstract. This paper reports the overview for the understanding of Islamic culture from the perspective of Islamic experts and Muslims based on the commonalities found in Hofstede's cultural dimension and Islamic worldview values. The understanding was gained from Wan Abdul Rahim et al. (2008) and a replication survey of VSM '94. We used this understanding as the benchmark for conducting experimental study to examine the time performance of Muslim online user in searching and purchasing books from two separate websites. The two websites were imposed with Islamic dimensions based from; (1) religious interpretation and; (2) user perception. The results of the paired-samples t-test showed that website imposed with Hofstede's dimension from religious interpretation is the better ones. Thus provide the indication that website that displays the cultural dimensions based on the religion prescriptions, will has a positive affect on the performance level regardless the current changes of the state of culture.

Keywords: Website Information Architecture, Culture Centred Website, Muslim Online User, Islamic Culture.

1 Introduction

Studies on cultural aspects of user interface and website information architecture (IA) in HCI have attracted significant empirical and non-empirical findings. However, studies that take on the challenges for cultural diversities are still few and considered far between [2] [9]. As the virtual environment is still primarily considered as a Western Culture dominated environment [9] [15], the current literature however, does not exhibit explicit work on Islamic culture and the application side of the Islamic culture on the design of the user interface and website information architecture (IA) [16]. Furthermore, the significant numbers of two billions Muslim population [4] and the growing concern for the acculturation of Islamic culture in the virtual environment [15], necessitates for researchers to look into the religion and Islamic culture perspective of user interface and website IA

[16] [19]. The effort of reintroducing the religious sentiment into the design is not considered as an issue but also as an essential need [12]. In fact, to preserve the religious beliefs and values, cultures have taken their own initiatives to conduct research and extensive investigation on how the design elements of user interface in the website environment may be influenced by their fundamental beliefs and values. The effort comes in parallel with the conceptual understanding that a website must include content and have a structure that is consistent with the values or cultural orientation [11]. In addition, technologies may also be redesigned to have different design features that will change the negative occurrence of certain social and cultural consequences of the Internet [1].

Islamic culture is different from the normal conventions of other culture of interest as the culture is prescribed by the religion [13] and Divine revelation [19]. This is because the basis of understanding for Islamic culture relies on the fundamental religious prescriptions and sources either from 'Quran' (Holy book), 'Hadith' (Prophet Muhammad's saying and action) and reputable Islamic authorities. In contrary, the normal convention of other cultures of interest may lie due to the deep understanding of culture influences from the acculturation factors. In general, cross cultural studies where the replication of Hofstede's cultural dimension and VSM '94 method, often took place to generate the general understanding of culture [7]. Currently, there is lacking of empirical investigation and exploration on issues rooted in deep cultural identities [15]. The contrast of cultural values between Islamic and Western cultures also causes to further confusion and bewilderment [10]. Failing to take religion and Islamic culture into consideration may partially explain the lacking of research from Arabic or Islamic countries on user interface and website IA in the online environment. Religion is not reducible to the components provide by Hofstede's cultural dimensions, however, the commonalities of the worldview values shared by Islamic culture with Hofstede's cultural dimension will provide a common understanding that supports the bridge between the Western and Muslim world.

Our research uses an innovative approach towards creating a better understanding of Islamic culture and the application side of cultural elements into the user interface and website IA. The approach consists of two parts; (1) the understanding of Islamic culture from the perspective of Islamic experts and Muslim online users and; (2) the evaluation of website prototypes that were developed based on the application of Islamic culture framework (driven from the perspective of Islamic experts and Muslim online users) into website IA design. In the first part of the work, we adopt our framework of Islamic culture [19] which highlights the commonalities of worldview values shared by Islamic culture to Hofstede's cultural dimensions. We used the understanding and adapt the framework as part of the data gathering process to be interpreted by Islamic experts and investigated on the perceptions of Muslim online users. The second part of the study followed with an one-to-one experimental study on Muslim online user. The experimental study was done to investigate whether website IA imposed with the designs of Islamic culture framework interpreted by the Islamic expert will has a better performance compared to website IA imposed with Islamic culture framework from the perception of Muslim online users.

The result of the study provides an initial understanding of Islamic culture and how the culture-centred website design will has a positive influence to user behaviour in searching and purchasing products from e-commerce websites. The paper structure is as follows. The next section discusses research method used in this study. This is followed by the results and discussion. This paper finishes with the implications of the results of this study for future research in the area of cross-cultural user interface and IA of website design.

2   Research Method

To create a better understanding of Islamic culture, we adapt the Hofstede's cultural dimensions [8] as the theoretical guideline in the data gathering process. We look for the commonalities found between Hofstede's dimensions and Islamic culture worldview values. This effort of drawing similarities between worldview values of Islamic culture and Hofstede's cultural dimensions were based from our prior work [19]. However, the work still lacks empirical investigation to justify the grounding of the formed Islamic culture framework. Thus, we extend the work by adopting the results of the previous qualitative interviewing with Islamic expert [19] into this study. The qualitative interviews with the Islamic experts reported in previous study provide a better understanding of Islamic cultural prescriptions from the interpretation of the Islamic experts [19]. This understanding provides the justification for 'what' is worldview values of Islamic culture should be from the religious perspectives. Then, we conduct a survey with Muslim online user by replicating VSM '94 study [7] to examine Muslim's cultural perception on Islamic culture worldview values through the lens of Hofstede's cultural framework. However, for this survey, acculturation factor was not being considered. The main objective of this survey is to provide better understanding of Islamic culture and to answer the following research questions (RQ).

RQ1:   Are the current cultural index scores for users coming from Islamic countries different from the cultural index scores produced by Hofstede in 1980s?

RQ2:   Are the worldview values of Islamic culture from the perspectives of Muslims different with the perspectives of Islamic Experts?

Forty-four Middle East and forty-four Malaysian postgraduate students were used in the survey. The sample size used in our study is in accordance with Hofstede's (2001) [7] recommendation of at least twenty to fifty samples for each country or even region. We used the result gained from our previous qualitative analysis [19] and the outcome from this subsequent survey as the basis for the development of website prototypes to be used in the one-to-one experimental sessions. For the experiment, we try to answer the subsequent research questions (RQ), which is:

RQ3:   Is website that reflects the design derived from the religion prescriptions of Islamic culture (Islamic Expert) has a higher performance level than website that reflects the design derived from Muslim's cultural perception?

To answer the question, we conduct an experimental usability sessions with similar respondents of forty-four Middle East and forty-four Malaysian postgraduate students taken from our prior survey. Initially, the first result and full discussion on the experimental method was published in our prior work, in which the analysis was solely focused on the time performance of browsing and searching for books [20]. However for this study, we provide another analysis on the partial findings that involves the complete tasks of user browsing, searching and purchasing the specified books by using the 'dummy' credit card provided by the researcher. For this experiment, two business-to-consumer (B2C) e-commerce prototype websites that reflects the incorporation of IA cultural designs were being used in the experimental session. However, we only focus on the dimensions of 'power distance' and 'uncertainty avoidance'. The following provides the understanding of both of the dimensions [18]:

(i) Power Distance

    This dimension refers to the state of which weaker member accepts inequality in power distribution [8]. Large PD suggests inequality in power distribution, whereas small PD suggests equality [8].

(ii) Uncertainty Avoidance

    The dimension relates to the state of a society feels vulnerable of taking risks in unpredictable and unknown situation [8]. High UA are uncomfortable with uncertainty and avoid taking risks, whereas low UA takes risks [8].

The first website (Iqra Bookstore 1) portrays the design elements based on the design prescriptions imposed by the religion prescriptions. The second website (Iqra Bookstore 2) uses the design elements that were primarily based on the current state of Muslim user perceptions on Islamic culture. The summary of the design elements of IA that were used in both website prototypes are shown in Table 1. The adapted design elements that were used to represents the Islamic cultural dimensions were based on our prior works as reflected in Table 2. The justification for the usage of the designs was also based on our prior theoretical works on website IA [17] [18].

Table 1. Summary of design on website prototypes

Cultural Dimension	Iqra Book Store 1 (High)	Iqra Book Store 2 (Low)
Power Distance	- Religion symbol / color	- Basic logo / non-religion related color
	- Highly structured access to information *(with sub- categories)*	- Low structure access to information *(without sub-categories)*
Uncertainty Avoidance	- Link open within window	- Link open new window
	- Symmetrical layout	- Non-symmetrical layout

Table 2. Adapted designs to Islamic dimensions [18] [19]

Islamic Dimension	IA Dimension	Design Prescriptions
High Uncertainty Avoidance	Navigation	- Navigation schemes to prevent users from lost - Simple clear metaphor, limited choice & restricted data - Local & contextual navigational system - Include customer service, navigation local stores, local terms, free trial
	Content	- Mental model and help systems on reducing "user error" - Redundant cues (color, typography and sound, etc) to reduce ambiguity and chunk info by topic / modular. - Include tradition themes, local stores & local terms, customer service and navigation, free trials & download
High Power Distance	Content	- Include hierarchy info & pictures of important people with title. - Include quality assurance, awards, vision statements & appeal in pride of ownership. - Tall hierarchy in mental models - Highly structured access to information
	Context	- Significant, frequent emphasis on the social & moral order (e.g. portrayal of nationalism/religion) and symbols

For the experimental sessions, two websites were used; in two separate treatments. Subjects were given a three minutes basic training on using the website. For each different treatment, subjects were instructed to perform the following tasks:

1. Registration
2. Seek the price tag of two given books and the total purchase amount. This is done by browsing and searching through different categories of book classification. The books specified here are:
   - "Belief of the Beliefs" and "Hadith: Summarized Sahih-Ul-Bukhari" *('Iqra Book Store 1') (first treatment)*
   - "Provisions for the Seekers: A Manual of Prophetic Hadiths" and "The Book of Beliefs" *('Iqra Book Store 2') (second treatment)*
3. The two specified books need to be added into the shopping cart by using a shopping cart tool. After that, 'check out' and make purchase of the books by using the provided 'dummy' credit card number, expired date and 'Card Verification Value' (CVV) number associated to the credit card information.
4. Finally, click 'log out'.

A three to four minutes break in between sessions and refreshments were provided to the subjects. The user tracking system was applied for both websites. The user tracking system tracks the time automatically after the registration. The data analysis in the next section was conducted for the complete time performance recorded for respondents doing all specified tasks; (1), (2), (3) and (4).

3   Results and Discussion

3.1   Muslim Online User Perception vs. Religious Prescription

Our survey was conducted to examine the perception of Muslim online user on Islamic culture based on the replication of VSM '94 [7] survey study. The initial survey conducted by Hofstede (1980) uses IBM employee respondents [6]. The partial review of the index score of Hofstede (1980) and the results of our survey for Muslims from selected Islamic countries are as shown in Table 3 and Table 4.

Table 3. Index scores of Hofstede's dimensions for selected Islamic countries [6] [7] [8]

Author	Cultural Dimension	Arab Countries (*)	Iran	Malaysia
Hofstede (1980)	Power Distance	80; High	58; Low	104; High
	Individualism	38; Low	41; Low	26; Low
	Masculinity	53; Medium	43; Low	50; Medium
	Uncertainty Avoidance	68; High	59; High	36; Low
Hofstede & Bond (1988)	Long Term Orientation	Not Available	Not Available	Not Available

(*) Arab countries (Egypt, Iraq, Kuwait, Lebanon, Libya, Saudi Arabia, UAE).

Table 4. Current index scores of cultural dimensions for selected Islamic countries

Cultural Dimension	Arab Countries (*)	Iran	Malaysia
Power Distance	18; Low	18; Low	30; Low
Individualism	71; High	71; High	75; High
Masculinity	49; Medium	49; Medium	36; Low
Uncertainty Avoidance	41; Low	41; Low	14; Low
Long Term Orientation	36; Low	36; Low	35; Low

(*) Arab countries (Iraq, Jordan, Syria, Yemen).

A review of the first research question (RQ) of this study is as follows:

RQ1:   Are the current cultural index scores for users coming from Islamic countries different from the cultural index scores produced by Hofstede in 1980s?

Table 3 and Table 4 provide the answer for RQ1 as it provides the understanding that there are differences of the index scores that generate the understanding of cultural dimensions for Muslims between 1980 and findings reported in this study. The main difference is clearly seen for the index score of Arab countries for the dimensions of 'power distance' (High), 'individualism' (Low) and 'uncertainty avoidance' (High) in 1980 with the current index scores in our study. The current index scores reflected the

opposite dimensions than what is being reported in 1980s; 'power distance' (Low), 'individualism' (High) and 'uncertainty avoidance' (Low). One reason for the differences may be due to the continual influences of the acculturation factors that might occurred throughout the years. However, future study may be required to test this assumption. This acculturation factors may also be due to the migration of people among countries and cultures and the degree of acculturation may also vary from a person to another [14].

The acquisition of the current index scores for cultural dimensions in Table 4 may also help to enrich the current understanding for Islamic culture. We use the partial result of Table 4 (present study) and make a comparative analysis with the theorized Islamic cultural dimensions provided in our prior study [19]. The prior study was based from the Islamic expert religious interpretation on the commonalities between the Islamic culture worldview values with Hofstede's cultural dimensions [19]. The comparative analysis is reflected in Table 5.

Table 5. Findings on the Islamic cultural dimensions

Cultural Dimension	[1] Prior work	[2] Present study
Power Distance	High	Low
Individualism	Medium	High
Masculinity	Medium	Medium
Uncertainty Avoidance	High	Low
Long Term Orientation	Low	Low

[1] Theoretical & qualitative study with Islamic experts [19].
[2] Empirical survey study with Muslims (Arab countries; Iraq, Jordan, Syria, Yemen).

A review of the second research question (RQ) of this study is as follows:

RQ2: Are the worldview values of Islamic culture prescribed from the perspectives of Muslims different with the perspectives of Islamic experts?

The result derived from Table 5 provides the justification and evidence for the differences of worldview values of Islamic culture between 'what' Islamic culture should be from the perspective and interpretation of Islamic expert and 'what' Islamic culture is from the perspective of Muslim users. The reason of the differences may had be due to the continual influence of acculturation factors but this factor was not being examined in this study. However, future study may be required to test the influences of the acculturation factors or other extraneous or moderating factors that may potentially contribute to the differences that the researchers may not be well aware of.

Based on Table 5, we only focus on the dimensions of 'power distance' and 'uncertainty avoidance' to provide the theoretical grounding for the construction of the two website prototypes; 'Iqra Book Store 1' (high dimensions) and 'Iqra Book Store 2' (low dimensions). These websites were later used in the one-to-one experimental sessions. The website 'Iqra Book Store 1' reflects the design of cultural

prescriptions by Islamic experts and the website 'Iqra Book Store 2' reflects the design of the user cultural perceptions based on the results of the replications of VSM '94 survey. The results of the one-to-one experimental sessions are shown in the next section.

3.2   Cultural Prescription vs. User Perception

This segment provides the result for the one-to-one experimental session conducted to measure the performance of Muslim online user for tasks of browsing, searching and purchasing the specified books. The respondents were instructed to perform specific tasks by using the two different website prototypes; (1) 'Iqra Book Store 1' imposed with the design prescriptions by the religion prescriptions and; (2) 'Iqra Book Store 2' imposed with the design prescriptions by the current state of Muslim user perceptions on Islamic culture.

   To satisfy the assumption of normal distribution, data transformation has been made to the 'timesite1' variable *(performance time recorded for browsing, searching and purchasing books using 'Iqra Book Store 1')* and 'timesite2' variable *(performance time recorded for browsing, searching and purchasing books using 'Iqra Book Store 2'),* as suggested by Field (2005). A review of the third research question (RQ) of this study is as follows:

RQ3:   Is website that reflects the design derived from the religion prescriptions of Islamic culture (Islamic expert) has a higher performance level than website that reflects the design derived from Muslim's cultural perception?

A hypothesis was developed to provide the answer for the RQ3. The hypothesis is as shown as follows:

H_1:   Website that portrays the design derived from the religion prescriptions of Islamic culture has higher performance level for user in performing tasks *(browsing, searching and purchasing books)* than website that portrays the design derived from the Muslim's cultural perception of Islamic culture.

The result of the hypothesis testing is presented as follows:

   A paired-samples t-test was conducted to evaluate the cultural dimensions impact on the time performance recorded in performing tasks *(browsing, searching and purchasing books)* for 'Iqra Book Store 1' and 'Iqra Book Store 2'**.** There was statistically significant increase in time performance score recorded in performing tasks *(browsing, searching and purchasing books)* for 'Iqra Book Store 1'; 'timesite1' ($\underline{M}$ = 1.23, SD = 0.31) to time performance score recorded in performing tasks *(browsing, searching and purchasing books)* for 'Iqra Book Store 2'; 'timesite2' ($\underline{M}$ = 1.64, SD = 0.34), $\underline{t}(87)$ = -11.46, $\underline{p}$<.0005. The Eta squared statistic (0.60) showed a large effect size. The result provides empirical support to prove the hypothesis (H_1) as it shows 'Iqra Book Store 1' is the better website compared to 'Iqra Book Store 2' based on the time performance score recorded in performing tasks *(browsing, searching and purchasing books)*.

4 Conclusion

This study reports on the findings that the design of website IA based on the religion prescriptions on what the Islamic culture be through the lens of Hofstede's cultural dimensions as theorized in our prior work [19] will has a positive affect on the performance level regardless the current changes to the state of culture. Hence, we prescribe that the understanding of Islamic culture framework should be based on the religious interpretation towards creating mutual understanding of Islamic culture. This is because the high dependency of Islamic culture from religion prescription itself is generally accepted among conventional Islamic communities. This approach however had made our study distinct from other cross-cultural studies that focus solely on the investigation of the current social state affair of the cultural of interest by replicating VSM '94 or conducting ethnography studies before applying the values to the IT artifacts. Ethnographic studies often took place by having an in-depth investigation of culture of interest. However, there is still considerable debate over what ethnography is in HCI design practice and how it can best be employed in design context [3]. Future research is being suggested to focus on different level of participants from different cultures, cities and countries. The results of this study will provides useful reference in developing cross-cultural B2C e-commerce and provides exciting avenue for future research on the website user interface and IA design. This design adaptation based on religious worldview values may create the awareness of the importance of preserving the values inside the IT artifacts towards realizing the fullest potential and capabilities of the Internet.

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