Measuring Cultural Markers in Arabic Government Websites Using Hofstede's Cultural Dimensions

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Abstract. This study examines the design characteristics of government web interfaces from three Arab countries using Hofstede's cultural dimensions. Organizational and graphical elements from 30 ministry websites from Egypt, Lebanon and Saudi Arabia were examined using content analysis. Element frequency scores were correlated with Hofstede's dimensions and interpreted based mainly on the model developed by Marcus and Gould. The results suggest that Hofstede's model of culture does not fully reflect the design characteristics of Arabic interfaces.

Keywords: Arab countries, Culture, Hofstede, Web design, Government websites.

1 Introduction

Culture is argued to be one of the attributes affecting the usefulness and usability of interfaces [14]. As such, researchers have investigated how different cultures represent themselves on the web, and how culture affects website design and usability. The rationale is that by localizing an interface through the incorporation of culturally appropriate design features, an interface becomes both more attractive and more functional for its users [11]. The bulk of the research in this domain has employed Hofstede's model [5, 6], based on the interpretations made by, amongst other researchers, Marcus and Gould [9].

2 Hofstede's Cultural Dimensions

Since their first introduction in 1980, Hofstede's cultural dimensions have had a profound influence on the development of cross-cultural studies in the social sciences [15]. Based on data collected from IBM employees from 40 countries, Hofstede proposed four dimensions of culture which differentiate between national cultures based on comparative scores assigned to individual countries. These dimensions comprise: *Power Distance*-the extent to which the less powerful members of organizations expect and accept that power is distributed unequally; *Individualism*-the extent to which individuals are integrated into groups; *Masculinity*-assertiveness and competitiveness

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versus modesty and caring; and *Uncertainty Avoidance*-intolerance for uncertainty and ambiguity. A fifth dimension, *Long-Term Orientation*-the degree of future orientation-was added later in 1982 when Hofstede expanded his model to include 10 more individual countries and three regions. For these regions, Hofstede grouped together several countries based on the assumption that they have similar cultural traits. These regions are East Africa, West Africa, and the Arabic-speaking countries [6]. In the latter he included seven countries: Libya, Iraq, Kuwait, the United Arab Emirates, Egypt, Lebanon and Saudi Arabia.

The Arabic-speaking countries had been initially surveyed both in 1969 and 1972, but when Hofstede tried to extend the country list in 1982, he found that IBM had accidentally wiped the tape containing the raw survey data. The only data that were saved pertained to the total region, so Hofstede was forced to treat these countries as one region, whereas he might have wanted to keep at least Egypt and Lebanon separate as Hofstede himself [6, p. 52] admitted that this made the region culturally less homogeneous than would be desirable.

As a group, these seven countries scored high on the Power Distance (80), Uncertainty Avoidance (68), and Masculinity (52) dimensions, while scoring low on the Individualism (38) dimension. The only dimension that does not have any scores for these countries is Long-/Short-Term Orientation.

In web design, interfaces with high Power Distance have an emphasis on social models such as nationalism and religion, have a strong focus on authority where prominence is given to leaders [9], and have restricted information access [1], and vice versa for low Power Distance. Interfaces with high Individualism (i.e. low Collectivism) are customizable, have images of individuals rather than groups [1], and motivation is based on personal achievements [9]. Masculinity in interfaces can be reflected through traditional gender distinctions between users, navigation is oriented to exploration and control, graphics and animation are used for utilitarian purposes [9], and they tend to have a visitor counter [13]. Feminine interfaces on the other hand have blurred gender roles, where tasks are accomplished through mutual cooperation and attention is gained through visual aesthetics. Interfaces with high Uncertainty Avoidance have a simple design with limited choices and a restricted amount of data, and vice versa for low Uncertainty Avoidance interfaces. Finally, users of interfaces with Long-Term Orientation must have patience in order to achieve results and goals, while users of interfaces with Short-Term Orientation have the desire for immediate results and achievements of goals.

3 Arab Countries in Cultural Design Studies

Cultural similarities and differences in web design have been discussed at length in the literature. However, Arab countries have received limited attention in this research area, despite the fact that 19% of the overall Arab population uses the internet [7] and therefore could potentially benefit from this research. Some studies that did opt to include web pages from Arab countries limited their country choices to as few as two countries. For example, in a study that included systematic inspection of design elements that are possibly preferred within a particular cultural group, Barber and

Badre [2] selected websites only from Lebanon and Saudi Arabia, which were initially chosen by Hofstede himself. Their findings indicate that these websites had a high frequency of right-to-left orientation and high frequency of flags in the government genre, relating to Uncertainty Avoidance and Long-Term Orientation dimensions respectively.

Zahir, Dobbing, and Hunter [17] selected national web portals also from two countries, Egypt and Morocco. Their results showed that websites from Egypt had a strong focus on the Egyptian culture, reflecting a high Power Distance characteristic. While websites from Morocco had a good presentation of women's issues and non-Islamic reference, relating to the Masculinity and Power Distance dimensions respectively.

Callahan [3], on the other hand, analyzed a total of 20 interfaces from the group of seven Arab countries included in Hofstede's model in her study of cross-cultural differences in the design of university websites. Although the number of websites from each country was not specified, the results pertaining to the Arab countries overall suggest that most of the design elements on their interfaces match their description on Hofstede's cultural dimensions.

In a study conducted by Marcus and Hamoodi [10], the researchers analyzed Arabic educational websites from Jordan, Egypt, and the United Arab Emirates aiming to determine whether or not the websites reflect Arabic culture. The results of this study show again that most of the design elements on these interfaces correspond to their characteristics on Hofstede's cultural dimensions.

4 Methodology

4.1 Country Selection

It was first necessary to define an "Arabic country", as different definitions will produce different member states falling within this category. As part of an ongoing research that includes all Arabic-speaking countries, a random three from Hofstede's original group of seven were included in this study: Egypt, Lebanon and Saudi Arabia (their home pages are reproduced in Figures 1-3).

4.2 Government Genre

Similar to Barber and Badre [2] and Cyr and Trevor-Smith [4], websites from the government genre were chosen for analysis. Government websites provide a sufficiently large sample size across the countries. In addition, these websites are created as a means of interaction with the locals; therefore they are presumably intended for a particular culture or nation, rather than the worldwide Internet community. Moreover, it is expected that designers who belong to the local culture created these websites, consequently likely reflecting the socio-cultural, technological and economic characteristics of their intended cultures in order to be successful in the services they provide.

The sample frame was based on the lists of government websites provided on the web portals of the countries' governing body. A simple random sampling was conducted to determine the final sample to be included in this study.

4.3 Analysis

The home page is argued to be the most important page of any website [12]; given its attention-grabbing and organizational roles, it is likely to contain many central elements of Web design [16]. Therefore, we applied content analysis method to the Arabic home page of 30 websites of ministries (except when the website was only provided in another language) from the selected three countries, 10 from each.

According to Krippendorff [8], content analysis is a valid method used to describe trends in a communication context, allowing researchers to draw inferences on patterns and differences among similar components of that communication context. The components in this research are the web design elements, described by Barber and Badre [2] as "cultural markers", which have been argued to be prevalent and possibly preferred within a particular cultural group. The analysis focused on the graphical, organizational, and navigational elements that consist of: presence of social models (national, religion, etc.), restriction of information access, logo depiction (traditional vs. modern), presence of animated images, page directionality (vertical vs. horizontal), number of hyperlinks, menus (simple vs. complex), presence of customization (font size, color, etc.), presence of a visitor counter, search engine, site map, and FAQ links. Images of people were analyzed according to the number (single vs. group), gender (male vs. female vs. mix), status (leader vs. citizen vs. mix). The difference of color choices and language options were also recorded.

Statistical analyses were performed using SPSS program based on the specific level of measurement for each variable. Categorical variables (e.g. presence of a search engine) were counted, converted to a percentage, and compared using non-parametric chi-square test. Descriptive statistics were used to describe continuous variables (e.g. number of links). The results then were compared to the description of Arab countries on each of Hofstede's cultural dimensions based on the interpretation in the literature [1, 9, 13].

4.3 Reliability

Two coders, fluent in Arabic and English, were trained in the coding scheme on non sampled websites. The proficiency of the Arabic language proved useful to determine the status of persons in images (official or citizen), especially when these images were associated with news items. The coders then analyzed the home page of each website to count the occurrence or non-occurrence of each of the cultural markers. An overall acceptable inter-coder reliability of 81% was established using Krippendorff's alpha.

5 Results

The content analysis of Arabic government web interfaces from Egypt, Lebanon, and Saudi Arabia suggest that overall there were significant differences in the depiction of cultural markers between the websites of these three countries on the one hand and the characteristics of Arabic-speaking countries on Hofstede's dimensions on the other. The chi square results for categorical variables are shown in Table 1, followed by descriptive statistics of the continuous variables, in addition to variables that are not necessarily associated with a particular dimension.

Table 1. Results of Chi-square test for the design elements

Dimension	Associated design element	%	χ^2	*df*	*p*
Power Distance	Social models	30%	4.8	1	.028
	Restriction to access	13%	16.13	1	.000
	Images of leaders	39%	ns	2	
Collectivism	Customization	23%	8.53	1	.003
	Images of groups	40%	4.70	1	.029
	Images of leaders	39%	ns	2	
Masculinity	Visitor counter	20%	10.80	1	.001
	Images of men	68%	49.77	2	.000
	Animated images	70%	4.80	1	.028
Uncertainty Avoidance	Vertical directionality	80%	10.80	1	.001
	Simple menus	37%	ns	1	
Long-Term Orientation	Search engine	70%	4.80	1	.028
	Site map	53%	ns	1	
	FAQ	23%	8.53	1	.003

Fig. 1. Ministry of Health, Egypt

Fig. 2. Ministry of Health, Lebanon

Fig. 3. Ministry of Health, Saudi Arabia

Additionally, Arabic is the main language in 83% of the websites (20% of which have no secondary language), and is a secondary language in 13% of them.

English is the second most used language with 17% of the websites using it as a main language and 63% using it as a secondary one. French is also used as a secondary language in 27% of the websites, mostly along with English.

As for background colors, 63% of the websites use white, 20% use blue, 17% use other colors (e.g. beige, brown, green). Interestingly, dominant colors are mostly blue with 40%, white with 23%, green with 20%, and 17% for other colors (yellow, grey, brown, ect.). Also the number of links varied greatly from one site to another, ranging from 15 to 240.00 links, with a total number of 2561.00 (M= 85.37, SD= 48.57).

6 Discussion and Conclusion

The preliminary results suggest that Hofstede's model of culture does not fully reflect the design characteristics of Arabic interfaces.

As countries with a high score on Hofstede's Power Distance dimension, we would expect Arab countries to have frequent use of social models, restrictions to access information, images of leaders, and traditional logos. Presence of social models and restriction of information access were less than expected, while the number of images of leaders was not significantly different than those that had mix status or citizens alone. Logo depiction did not have an acceptable agreement between coders, and therefore it was not reported.

As belonging to a collectivist culture in Hofstede's model, Arabic interfaces would be expected to show low customization (i.e. font size, color, etc.), have more frequent images of groups and images of leaders than individuals and "ordinary" citizens. This assumption was confirmed for customization, but not for images of leaders or images of groups.

Arab countries are described as having a relatively masculine culture in Hofstede's model. Therefore, we would expect their interfaces to have frequent use of visitor counters, images of men and animated images. This assumption was confirmed for images of men and the presence of animated images, but not for visitor counter.

Scoring low on Hofstede's Uncertainty Avoidance, we would expect Arab countries to have more frequent horizontal pages, simple menus, and relatively low number of links. This assumption was confirmed for the last two elements.

Although Arab countries do not have a score on Hofstede's fifth, Long- vs. Short-Term dimension, they could be described as long-term oriented. Therefore, it was interesting to find that most websites have search engines and site maps as means to search for information, contrary to what we would expect. But as expected, these websites have few FAQs links.

While the results of this study confirm the results of other studies that included Arab countries [2, 17], in regard to the use of culturally favored colors and depiction of images, they also refute the results of other studies, for example, Callahan [3], in regards to the presence of search engines and page orientation. The differences in the results could be attributed to the difference in country selection or website genre, therefore further research is needed.

This study has several limitations. First, websites from only three countries out of a possible seven that Hofstede included in his model were analyzed, limiting the comparison between countries. Second, the results might be influenced by the type of website chosen for analysis, as noted by Barber and Badre [2]. Third, we conducted a quantitative analysis on the design elements. The research would be more robust and representative when qualitative analysis is included to investigate how people in these countries interpret and respond to the design of their government web interfaces.

The study results and limitations imply the need for further research. Future investigation will focus on the remainder of the countries from the group of seven, as well as other Arab countries excluded from Hofstede's model. In addition, websites from another genre than government will be included in order to yield more meaningful results and to produce valid comparisons across genres. The much wider question remains, of course, as to whether the usability of an Arabic website is enhanced by designing it in accordance with these cultural markers.

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