

# **Investigating the Design of Arabic Web Interfaces Using Hofstede's Cultural Dimensions: a Case Study of Government Web Portals**

**Abstract:** This study examines the design characteristics of Web interfaces from Arab countries using Hofstede's cultural dimensions. Organizational and graphical elements on a sample of 15 home pages of government Web portals are examined using content analysis. Element frequency scores were correlated with Hofstede's dimensions and interpreted based on Marcus and Gould's (2000) study. The results suggest that Hofstede's model of culture does not fully reflect the design characteristics of Arabic interfaces.

**Résumé :** Cette étude examine les caractéristiques d'interfaces web de pays arabes au moyen des dimensions culturelles de Hofstede. Les éléments organisationnels et graphiques d'un échantillon de 15 pages d'accueil de portails gouvernementaux sont étudiés dans le cadre d'une analyse de contenu. Les scores de fréquence des éléments sont mis en corrélation avec les dimensions de Hofstede et interprétés en fonction de l'étude de Marcus et Gould (2000). Les résultats suggèrent que le modèle culturel de Hofstede ne reflète pas pleinement les caractéristiques des interfaces en arabe.

## **1. Introduction**

As culture is argued to be one of the attributes affecting the usability of interfaces (Shneiderman and Plaisant 2010, 28-29), many researchers have investigated cultural presence on the Web to determine if and how culture affects site design and usability, and how different cultures represent themselves on the Web. 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. Culturization of interfaces does have its detractors, however, who emphasize the difficulty of determining the user base from a cultural perspective of any particular interface, as well as the danger of stereotyping cultures. And the fact that any one individual can simultaneously be a member of multiple cultural groupings. The bulk of the research in this domain has employed the theory of the anthropologist, Geert Hofstede, as the basis of comparison across cultures (Komlodi 2005). Hofstede himself conducted his research among IBM employees around the world using attitude questionnaire surveys, but more recently his theory has been applied to interface design.

Through the examination of data that were gathered from 50 countries and 3 regions of the world between 1967 and 1982, Hofstede formulated five dimensions by which he argued all cultures could be evaluated (Hofstede 2001). These dimensions are: Power Distance, Individualism/Collectivism, Uncertainty Avoidance, Masculinity/Femininity, and Long/Short-term Orientation. Power Distance describes the perception of equality and inequality, and the distribution of power between members of a culture. Individualism/Collectivism ranks cultures based on the individual or collectivistic orientations of their members. Masculinity/Femininity refers to gender roles, not physical characteristics, within cultures. Uncertainty Avoidance describes the extent to which the

members of a culture feel threatened by unknown situations. Finally, Long-/Short-term Orientation describes future versus historical (past) orientations of the culture.

One of Hofstede's three regions comprised seven Arabic-speaking countries. Hofstede originally had intended to analyze individually the cultures of these countries, but destruction of his data forced him to make the assumption that individual cultural differences would not be found (as well to assume that these seven countries were representative of all Arabic countries) and therefore to derive cultural measures from this generalized set. Subsequently, Hofstede's dimensions have been used to evaluate the extent to which interfaces, and especially websites, represent the cultural values of the interfaces' primary user communities (Marcus and Gould 2000).

Based on Marcus and Gould's (2000) interpretation of Hofstede's dimensions on interfaces, websites with a high Power Distance would have high access to information with tall hierarchies and a strong focus on expertise and authority, and vice versa for low Power Distance. Interfaces with high Collectivism maximize users' motivation based on group achievement, and prominence is given to leaders who portray tradition and history. Interfaces with Individualism would depict the opposite of Collectivism. Masculinity on interfaces can be reflected through traditional gender and age distinctions between users. , Navigation is oriented to exploration and control, and graphics and animation are used for utilitarian purposes. Feminine interfaces on the other hand have blurred gender roles, where tasks are accomplished through mutual cooperation and attention is gained through visual aesthetics. Additionally, interfaces with high Uncertainty Avoidance have a simple design with limited choices and a restricted amount of data, with the opposite in the case of low Uncertainty Avoidance interfaces. Finally, Long-term Orientation can be reflected in practical values and relationships as a source of information, where users must have patience in order to achieve results and goals. On the other hand, the content of interfaces with a Short-term Orientation focuses on certainty of beliefs and rules as a source of information. Users of these interfaces have the desire for immediate results and achievements of goals.

This paper reports on a study that examined the design characteristics of selected government Web portals from 15 Arab countries and compared them to the characteristics associated with Arab countries on four of the five dimensions in Hofstede's model of culture (the Arab countries were not assigned a score by Hofstede on his fifth dimension). Its primary purpose, as part of a larger study, is to develop a website assessment index that can be used to compare government websites from these countries.

This study focused on government Web portals for two reasons. First, they are primarily intended for a particular culture or nation, rather than the worldwide Internet community. Second, indigenous portals catering to the needs of distinct cultural groups can be expected to have as one design goal the reflection of the socio-cultural, technological and economic characteristics of their intended cultures in order to be successful in the services they provide (Zahir, Dobing and Hunter 2003).

## **2. Methodology**

It was first necessary to define an "Arabic country", as different definitions will produce different member states falling within this category. In this study five possible Arab countries (Comoros, Djibouti, Mauritania, Somalia, and Sudan) were excluded because Arabic is not the sole official language. The United Arab Emirates were excluded

because the government website was under construction at the time of the study. The final selection comprises 15 countries: Algeria, Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, Syria, Tunisia, and Yemen. Using the terms “government” and “portal” associated with countries’ names in Arabic, a Google search was conducted to identify the sample Arabic government portals, one for each country.

The unit of analysis is the Arabic homepage of each of the selected websites, because it serves as the “front door” to the entire website or sub-site and also provides consistency across the sample since all units are therefore limited to a single page (Sun 2001), and also because it is likely to contain many central element of Web design (Weare and Lin 2000).

The analysis of the Web portal designs focused on several organizational and graphical elements: page layout, symmetry, menus and links, pictures, presence of search engines and site maps, and colors. Described as “cultural markers by Barber and Badre (1998), these elements are most prevalent and possibly preferred within a particular cultural group. The description and frequencies of occurrence of these design elements are counted and then converted to Hofstede’s dimensions based on a methodology developed by, amongst others, Marcus and Gould (2000).

Before the actual analysis took place on the selected websites, two coders were trained on non-sampled websites to identify any ambiguity in the analysis process. An intercoder reliability of 88% was established using Holsti’ reliability formula.

### 3. Results

The sites were analyzed for Web page symmetry (verses asymmetry), images of authority figures (verses images of citizens), architectural images (verses images of people), logos, page layout (vertical vs. horizontal), number of hyperlinks, menus, group and gender images and animation. The results are shown in Table 1.

Element	%	<i>df</i>	$\chi^2$	<i>p</i>
Symmetry	27%	1	5.4	<i>p</i> <.05
Images of authority figures	65%	1	3.27	<i>p</i> >.05
Images of groups	54%	1	0.24	<i>p</i> >.05
Gender in images	76% (men)	2	30.87	<i>p</i> <.05
Animated images	33%	1	1.67	<i>p</i> >.05
Architectural images	22%	1	7.41	<i>p</i> <.05
Horizontal page layout	13%	1	8.07	<i>p</i> <.05
Simple menus	87%	1	8.07	<i>p</i> <.05

Table 1: The results of Chi-square test for design elements

Additionally, all the sampled websites used logos, and all represent traditional emblems of the countries in question. White is the most used color for background (60% of the websites) While blue and green were mainly used as dominant colors throughout the sample. Also the number of links varied greatly from one site to another, ranging from 22 to 127 links, with a total number of 892 (M=59.47, SD=26). As to modality of images and its indication of the MAS index, we could not run a test because intercoder reliability was not established.

#### **4. Discussion**

The content analysis of Arabic government Web portals suggests that Hofstede's model of culture does not fully reflect the design characteristics of Arabic interfaces. This indicates that it should be used with caution when employed as a means to investigate variations in design between interfaces.

As countries with a high score on Hofstede's Power Distance dimension, we would expect Arab countries to have more frequent symmetrical pages, images of leaders, images of buildings, and traditional logos. This assumption was partially confirmed. Scoring low on Hofstede's Uncertainty Avoidance, we would expect Arab countries to have more frequent horizontal pages and relatively low number of links. This assumption was partially confirmed. As a collectivist culture in Hofstede's model and based on the interpretation of Marcus and Gould (2000), Arabic interfaces would be expected to show more frequent images of groups and images of leaders than individuals and "ordinary" citizens. This assumption was fully confirmed. Arab countries are described as having a relatively masculine culture in Hofstede's model. Therefore, we would expect their interfaces to have more frequent images of men and animated images. This assumption was also partially confirmed.

Although Arab countries do not have a score on Hofstede's fifth, Long- vs. Short-term dimension, it was interesting to find that 73% of the total websites have a search engine and 67% have a site map as means to search for information. This is contrary to what we would expect from countries that could be described as having a long-term orientation.

While the results of this study confirm the results of other studies that included Arab countries (e.g. Barber and Badre 1998) in regard to the use of culturally favored colors and images of people, they also refute the results of other studies (e.g. Callahan 2007) in regards to the presence of search engines and page orientation.

The lack of significant results for some elements could be attributed to the small sample size or intercoder reliability. Therefore, increasing the sample size of websites from Arab countries in future studies could yield more meaningful results. It would also allow for comparison between individual Arab countries (rather the group as a whole) and whether some or all better match Hofstede's scores. Another limitation could be the coding scheme which needs to be improved to include more design elements for future content analysis studies of government websites.

This small study has only attempted to evaluate a sample of Arabic government websites using the dimensions established by Hofstede and as applied to interface design in order to explore whether the website interfaces conform to his cultural markers. 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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