

Cross-Cultural Strategies for Web Design

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Abstract—People from different cultures favor web pages characterized by the values of their culture and, therefore, tend to prefer different characteristics of a website according to their cultural values in terms of navigation, security, product information, customer service, shopping and design tools. For a company aiming to globalize its market it is useful to implement country specific cultural interfaces and different web sites for countries with different cultures. This paper, following the conclusions proposed by two models of Hall and Hofstede, and the studies of Marcus and Gould, defines, through an empirical analysis, the guidelines of web design for both the Scandinavian countries and Malaysia.

Keywords— Cultural dimensions, cultural markers, Hofstede, web design, web marketing.

I. INTRODUCTION

THE effects of globalization - in the form of labour and capital mobility, international trade, global information and communication technologies, networks' competition [1], and platform standardization [2] -, combined with the speed of change, impel organizations and people to stay up-to-date with current knowledge, cultures and technologies [3]. In particular, ICTs offer enterprises an unprecedented opportunity to improve their technical efficiency and their attitude to provide quality services [4]-[5]. In today's economy, the capacity of companies to create value relies on their ability to continuously innovate, to exploit new technologies and to take full advantage in creating networks [6]-[7].

Following this lead, this study deals with the problem of globalization, company internationalization, cross-cultural marketing and company outcomes. The research starts from the findings of two models of cultural analysis: the model of Hall [8], which classifies the culture of a country relying on the study of its communicative context, and the model of Hofstede [9], which analyzes the national cultures through the definition and measurement of five dimensions. By applying the model of Marcus and Gould [10], which transposes the cultural dimensions of Hofstede and Hall in web design

characteristics, the connection between the Hofstede and Hall's models and web design is outlined. Indeed, the research of Marcus and Gould allows the identification of the elements that can vary within web sites depending on national culture (cultural markers). In particular, these authors propose an analysis of cultural markers of web sites according to the values of the seven dimensions of both Hofstede and Hall.

Following this lead, our research is carried out by studying a sample of websites in order to highlight, from the analysis of their cultural markers, the correspondence between the latter and the cultural dimensions on which they are based. The objective of this research is to verify the current validity of the results of Hofstede and Hall, and to provide design specifications for web multicultural design. The sample of websites is selected using: the Alexa scale, which ranks the most important sites of each country; the Google search engine for each country under analysis; the customer portfolio of web design companies, specialized in e-commerce and e-business site design.

II. LITERATURE REVIEW

A. Hofstere cultural dimensions

Several researches [10]-[11], starting from Hostede's work [9]-[12]-[13]-[14]-[15], study cultural differences in Web site design. According to Hofstede, national cultures vary along five dimensions: Power Distance (PD), Individualism versus Collectivism (IDV), Femininity versus Masculinity (MAS), Uncertainty Avoidance (UAI), and Long versus Short-term Orientation (LTO). Hofstede's dimensions are characterized as follows:

- Power Distance Index (PDI): it represents the level of social acceptance of power asymmetry. A country with a high PDI is characterized by hierarchical, authoritarian leadership and by a great acceptance of social inequalities. Conversely, a country with low PDI is characterized by social equality, autonomy, and collaborative leadership;
- Uncertainty Avoidance Index (UAI): measures the degree to which people avoid uncertain situations. Counties with a high UAI try to minimize risks through the use of technology, legal standards and control systems; on the contrary, those with low UAI are more tolerant of different opinions and are characterized by a higher risk propensity and by adaptation to changes.
- Individualism (IDV): individualistic societies value personal achievement and self care and care of nuclear family; on the contrary, collectivistic societies value social group achievement and offer protection in exchange for group loyalty.
- Masculinity (MAS): cultures with a high masculinity

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index are characterized by distinction between gender roles, whereas cultures with a low masculinity index tend to minimize gender differences. In masculine cultures challenges and social achievement play an important role, while in feminine ones the most important values are quality of life, environmental care, security and attention to others.

- Long-Term Orientation (LTO): cultures with a high LTO are oriented towards future rewards and are characterized by perseverance and thrift. Short-Term Orientation cultures are oriented towards the past and present and are based on respect for tradition and on satisfying social obligations [14].

Hofstede's theory of cultural dimensions faced several criticisms over the years, about both the methodology used and the reliability of the data [16]-[17]-[18]-[19]-[20]-[21]-[22]. Nevertheless these criticisms and the limitations of Hofstede's theory, it has however been applied in Human-Computer Interaction (HCI) researches in order to analyze web sites design in different cultures. With regards to such cultural adaptation, several cultural markers had been proposed by Marcus and Gould [10]: web site value promotion (images, sounds and videos), web site structure (data organization, menu and layout), web site navigation (easiness or difficulty to navigate); interaction towards user involvement (animations and toolbars), web site appearance (images, colors and graphics).

B. Hall cultural typologies

Hall [8] assumes that culture and communication are indivisible concepts that can influence each other. Standards and rules of language are learned in childhood, therefore people are generally unaware of how culture influences their behaviors and the way they communicate. The term 'context' is used by Hall to define this cultural background that surrounds an event. Two types of cultures can be identified according to linguistic communication: High Context and Low Context. In High Context cultures the meaning of the message is mainly in the context of communication; communication is not direct and the context is, therefore, more important than words. In Low Context cultures communication is more explicit and direct; most of the message information can be found in the words, while the meanings are less dependent on the context.

The cultures of the world can be classified on a scale ranging from high to low contextualization: Japanese, Chinese, Eastern countries, Koreans, African-Americans and people of the Mediterranean are considered High Context cultures, while Germans, Scandinavians and North Americans are considered Low-Context.

The cultural model proposed by Hall, based on the importance of language as the most tangible manifestations of a culture, allows the analysis of relations and intercultural communication. Moreover, it is characterized by high flexibility and can be easily adapted to the context under consideration, even though it is not based on empirical data as Hofstede's one.

III. CULTURAL IMPLICATIONS IN WEB DESIGN

Through the studies of Hofstede and Hall it is possible to analyze different cultures according to their different attitudes about work, family, social and political situations. These different attitudes should be taken into consideration even in web design, as they play a significant role in the usability of web sites. Users with different cultural context have different preferences and perceptions of web sites, especially those focusing on e-commerce.

A multicultural interface, or the ability to adapt the characteristics of a web site according to different cultures, is an effective form of communication. Indeed, a website cultural adaptation allows companies to address web communication by considering the distinctive factors of different ethnic backgrounds.

Several studies examine culture influences on the web design and outline cultural markers that represent the web site characteristics directly influenced by different cultures [10]-[23]-[24]-[25]-[26].

In order to highlight the implications of the models of Hofstede and Hall in web design Marcus and Gould [10] are chosen among the others. The cultural markers, namely the characteristics of a website from which to deduce the influence of culture on web design, proposed by Marcus and Gould are:

- Promotion of the values: culture values can be found in the web images, sounds and video.
- Structure: the way of organizing data, menus and layout of a website.
- Navigation: indicates the features regarding the easiness or complexity of navigating through a website.
- Interaction: indicates the level of involvement of the users in interacting with a website.
- Appearance: the choices inherent the image, the colors and graphics of a web site.

Table I, reported below, show the cultural markers, according to the cultural models of Hofstede and Hall, proposed by Marcus and Gould.

IV. ANALYSIS OF THE TWO CULTURES

A. Malaysia

For the Malaysia the values of Hofstede's indicators are the following: PDI: 104, IDV: 26, MAS: 50, UAI: 36. The index of long-term orientation (LTO) has not been calculated by Hofstede. Therefore, we esteem this value considering the ethnic groups that live in Malaysia (10% Chinese, 40% Indian, 50% Malay); by applying a weighted average of the numerical values of LTO indexes for China and India, Malaysia has an index of long-term orientation equal to 89. The dimension of masculinity has a neutral value (50) relative to the scale of Hofstede. As regards the Hall's model, Malaysia has been classified a High Context culture.

In this analysis, 40 Malaysian commercial websites and their characteristics of layout, color, images, animations and language are analyzed.

TABLE I

WEB DESIGN IMPLICATIONS FOR CULTURAL MARKERS DEPENDING ON THE SIZE OF THE MODELS OF HOFSTEDE AND HALL (MARCUS AND GOULD, 2000)

	Value promotion	Structure	Navigation	Interaction	Appearance
Collectivism	<i>Relationship-oriented</i>	<i>Role-oriented</i>	<i>Group-oriented</i>	<i>Limited</i>	<i>Images of groups</i>
Individualism	<i>Action-oriented</i>	<i>Task-oriented</i>	<i>Customizable</i>	<i>Active-oriented</i>	<i>Dynamic speech</i>
Low Power Distance	<i>Public spaces</i>	<i>No relevancy ranking</i>	<i>Open access</i>	<i>Supportive error messages</i>	<i>Informal speech</i>
High Power Distance	<i>Institutions</i>	<i>Relevancy ranking</i>	<i>Restricted access</i>	<i>Severe error messages</i>	<i>Images of leaders</i>
Femininity	<i>Family-oriented</i>	<i>relationship-oriented</i>	<i>Multiple choices</i>	<i>Function-oriented</i>	<i>"Feminine" colors</i>
Masculinity	<i>Sport-oriented</i>	<i>Goal-oriented</i>	<i>Limited choices</i>	<i>Individual-oriented</i>	<i>"Masculine" colors, shapes, sounds</i>
Long-Term Orientation	<i>Stable family</i>	<i>Social coherence</i>	<i>Contemplation-oriented</i>	<i>Face-to-face communication</i>	<i>Pictures of groups inviting participation</i>
Short-Term Orientation	<i>Change roles, jobs, objects</i>	<i>Liberty</i>	<i>Quick-results</i>	<i>Anonymous messages tolerated</i>	<i>Concentration on showing task or product</i>
Uncertainty Tolerance	<i>Abstraction</i>	<i>Tolerance for ambiguousness</i>	<i>Varying</i>	<i>General</i>	<i>Ambiguous</i>
Uncertainty Avoidance	<i>Familiar</i>	<i>Clear articulation</i>	<i>Simple</i>	<i>Precise</i>	<i>Simple, clear</i>
Low Context	<i>Values of individualistic societies</i>	<i>Simple</i>	<i>Goal-oriented</i>	<i>Lower use of animation</i>	<i>Image of product</i>
High Context	<i>Collectivist</i>	<i>Process-oriented</i>	<i>Interaction-oriented</i>	<i>High animation</i>	<i>Lifestyle of individuals</i>

The commercial websites address their communication to the three ethnic groups equally. The official Malaysian language is Bahasa, but the most commonly used among the three different ethnic groups is English because Malaysia has been a colony of Britain for many years. Indeed, the default language is English in 95% of the web sites and the Bahasa in only the remaining 5%.

The structure of the commercial websites appears to be complex and, according to their cultural markers, heterogeneous within the sample.

In Table I the intersection between the cultural dimensions of Hofstede and Hall and the cultural markers of Marcus and Gould provide companies with website implications. For example, for a country tolerant to uncertainty (low UAI) and with a High Context culture, such as Malaysia, the website structure should be complex, process-oriented, and aimed to create a relationship with the user. The theoretical model proposed by Marcus and Gould (Table I) is empirically supported by the quantitative analysis we performed for our study of Malaysian websites. Indeed, our findings are the following:

- in 70% of websites the menus are complex and in 30% simple;
- in 50% of websites the menu is single and horizontally positioned at the top page; in 42% of websites there are horizontal menus at the top page combined with vertical ones, and in the remaining 8% there are a combination of a vertical or horizontal menus at the bottom;
- 75% of websites have a vertical scrolling, demonstrating the oriental culture in which scrolling is considered as "animation" of the page. Vertical scrolling of the page, as well as animations, increase user involvement and exploratory approach towards the website.

These results show that the Malaysian web design focus on involving the user through complex menus with many available paths and the presence of scrolling.

The company logo is present in 95% of the websites and its location is in the upper left corner in 78% of cases.

The analysis of the presence of the search bar has been introduced to evaluate the theorization of Marcus and Gould according to which the search bar is a key element of uncertainty adverse countries. In our analysis the search bar is present in 75% of Malaysian websites and it is located in the upper right in 53% of cases.

The Top Title is present in 42% of commercial websites and in the 80% of government websites. The difference between the two website typology is for highlighting logos and national flags representing the national identity.

The use of colors is very widespread in the Malaysian websites. As regards the background, it is mainly white in the 60% of the websites, while in the remaining 40% is enriched by shades of other colors. The colors of the menus are mainly blue, green, red and black. Indeed, for Malaysia the green color represents the concept of growth and peace, while the use of red is due to the influence of Chinese culture. A color widely used, especially in the title, is blue because, on the one hand, it contrasts with the background of the web pages and, on the other hand, it is preferred to black because in the Eastern tradition the latter is linked to the concept of death. The color of the main text is black and in the 40% of cases the blue or red are used to highlight the key concepts of the web page.

The images of group and of buildings are the most commonly used. This demonstrates the dimensions of Hofstede, IDV and PDI, which ranks Malaysia as collectivistic and with a high power distance.

The images related to masculinity and femininity are almost similar, in accordance with the index of Hofstede MAS, which is equal to 50.

The Malaysian websites frequently use animations to catch consumer attention, as the Malay culture is both tolerant to uncertainty and High Context. The 75% of the analyzed

TABLE II
HOFSTEDE'S CULTURAL INDICATORS FOR SCANDINAVIAN COUNTRIES

Scandinavian Countries	PDI	IDV	MAS	UAI	LTO
Finland	33	63	26	59	
Sweden	31	71	5	29	33
Norway	31	69	8	50	20
Denmark	18	74	16	23	

websites contain one or more moving images. The videos are not widely used, but the coefficient of texts in motion is equal to 7% per web page; the sound is present in the 12.5% of the sites analyzed. The high context and tolerant to uncertainty Malaysian culture is expressed through the use of animations, moving text and bright colors (Table I).

B. Scandinavian Countries

The five dimensions of Hofstede for the Scandinavian countries have values very similar to each other except for the UAI (Table II). The Scandinavian countries, therefore, are characterized by a high power distance, by an individualistic culture, by a low index of masculinity and by a short term orientation. In addition, the model of Hall classifies the Scandinavian countries as a Low Context culture.

In our study 25 commercial websites have been analyzed for each Scandinavian country, for a total of 100 websites. As well as for the Malaysian websites, we assessed their characteristics such as layout, color, images, animations and language.

Each country under study (Denmark, Finland, Norway, Sweden) uses its national language as the default language. In the 33% of websites English is used in addition to the default language.

According to Marcus and Gould, it is possible to observe that a Low Context and short term oriented culture, such as the Scandinavian one, require that the website structure is simple and characterized by quick navigation. The theoretical model proposed by Marcus and Gould (Table I) is empirically supported by the quantitative analysis we performed for our study of Scandinavian websites. Indeed, our findings are the following:

- the 85% of the analyzed websites has a simple menu, while only the 15% has a complex one.
- the 94% of the websites has single menus in the homepage: in the 79% it is located at the top of the homepage, while in the 11% is placed vertically on the left. Only in the 6% of the websites two menus are present on the homepage, showing the preference of the Scandinavian users to interact with a simple site.
- the 96% of websites analyzed do not have the scrollbar and the websites are limited in space, not exploiting the vertical dimension. These values show that users prefer interactions as simple and quick as possible while browsing.
- In the 33% of the analyzed websites search bars were not found, while in the remaining 77%, the 59% has the search bar in the top right of the homepage.

The color used for the background is white in the 80% of the analyzed websites. This value is so high because a white background puts strong emphasis on the body of the text and on all the other components of the web page.

The colors most frequently used for the title are black and blue, respectively with 28% and 25%. The most commonly used color for the body of the text is black, present in 88% of cases.

The three categories of images used in most websites are respectively those regarding products (36%), femininity (28%) and individualism (15%). The most widespread images are of women (45%) and individual images (24%), rather than men (9%) and groups (6%). These results clearly reflect the cultural characteristics of the Scandinavian countries, i.e. high femininity and a tendency to individualism.

Video animations and sounds are present only in the 3% of websites, confirming that Low Context cultures with a low value of LTO, such as the Scandinavian ones, prefer a simple and direct interaction with the websites.

V. COMPARATIVE ANALYSIS OF THE TWO CULTURES

In this section we compare the results obtained by Malaysian websites with the Scandinavian ones. These two countries appear to be culturally different, according to Hofstede's values (figure 1). The main cultural differences between the two countries regard the power distance (104-28), individualism (26-70), masculinity (50-13) and a long-term orientation (60-25). Moreover, another difference between these two cultures is that Malaysia is an High Context culture and Scandinavian countries are Low Context one [8].

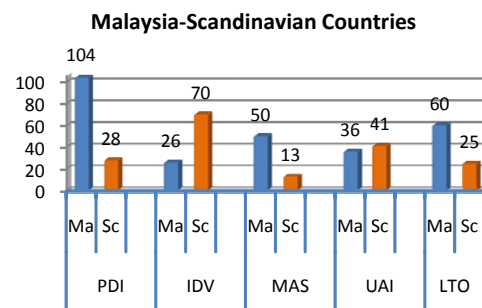


Fig. 1 Comparison between Malaysia and Scandinavian Countries according to Hofstede's dimensions

By comparing the results obtained from the analysis of the websites, we can observe how different cultural markers can fit culture and, therefore, the characteristics of the websites: value promotion, structure, navigation, interaction and product appearance [10].

In comparing the characteristics of Malaysian and Scandinavian websites, value promotion and product appearance have been investigated through images and colors; structure and navigation through the layout; interaction through video animations and sounds. In the following the results of the comparison of the two cultures through cultural markers are presented.

The main differences between Scandinavian and Malaysian layout are about the complexity and uniqueness of the menu and the presence of a scroll bar. Scandinavian websites have in the 94% single menus and in the 85% simple menus. The vertical scroll bar is only in the 38% of websites and it is very short.

The uniqueness and simplicity of the menu, along with the page size of Scandinavian websites, confirm the influence of culture on cultural markers of web design. Indeed, Low Context and short-term oriented countries, such as Scandinavian ones, are characterized by direct and short interactions while browsing, therefore websites are designed accordingly. On the contrary, High Context and long-term oriented countries, such as Malaysia, are characterized by an exploratory approach during navigation, targeted to interact and search for fun on the website and, therefore, websites are designed accordingly.

The results of the comparison between images of Malaysian and Scandinavian websites clearly reflect the Hofstede's dimensions. The Scandinavian countries have an individual, feminine and low power distance culture. Malaysia, on the contrary, has a collectivist, more masculine and high power

distance culture.

The Malaysian culture is long term oriented and High Context. Accordingly, it prefers animations, bright colors, originality and interaction with the web pages.

The Scandinavian culture is short term oriented and Low Context. Accordingly it prefers simple and minimal interactions with the websites, clear and explicit messages and few animations.

VI. CONCLUSION

This study allows to define the guidelines for the design of websites according to cultural models characterizing the target countries when a company is involved in a process of business internationalization.

According to the analysis carried out on Malaysia and Scandinavian countries and to Hofstede's characteristics, it is possible to outline some general guidelines for web design in a multicultural perspective. In particular, the cultures of the world can be classified, according to Hall, from high to low contextualization; in this perspective, the Japanese, the Chinese, the Koreans, the Eastern countries, Africans, South Americans and the Mediterranean people belong to the High

TABLE III
SUMMARY OF THE CULTURAL ASPECTS OF THE WEB DESIGN COVERED BY THE STUDY

	Value promotion	Structure	Navigation	Interaction	Appearance
Collectivism	<i>Values representing union and relationship</i>	<i>Role-oriented</i>	<i>Group-oriented: not customizable paths</i>	<i>Limited</i>	<i>Images of groups</i>
Individualism	<i>Action-oriented and success-oriented values</i>	<i>Task-oriented</i>	<i>Customizable and individual paths</i>	<i>Action and exploration oriented</i>	<i>Images of groups or products, market-oriented topics</i>
Low Power Distance	<i>Institutions and places representative of the concept of equality: public spaces and areas</i>	<i>No logical hierarchical structure for data</i>	<i>Free access to many pages and paths</i>	<i>Messages and guides in a tone of voice indicative of support and help</i>	<i>Images of people and daily activities; popular music, informal speeches</i>
High Power Distance	<i>Institutions and buildings representing a strong hierarchy</i>	<i>Data structure in hierarchical order</i>	<i>Restricted access</i>	<i>Messages and guides in a severe and authoritative tone of voice</i>	<i>Images of leaders and the nation, official logos and hymns</i>
Femininity	<i>Family-oriented, quality-oriented authenticity and genuinity</i>	<i>relationship-oriented</i>	<i>Multiple choices</i>	<i>Practical and cooperative</i>	<i>"Feminine" color, shapes and sounds</i>
Masculinity	<i>"Masculine" values: success-oriented and sport-oriented</i>	<i>Goal-oriented</i>	<i>Limited choices</i>	<i>Individual-oriented</i>	<i>"Masculine" colors, shapes and sounds</i>
Long-Term Orientation	<i>Values oriented to perseverance and parsimony</i>	<i>Complex data structure and menus</i>	<i>Tolerance for long procedures or path, contemplation-oriented</i>	<i>Preference to interact, with dynamic sites inviting participation</i>	<i>Highlight product features designed to build customer loyalty</i>
Short-Term Orientation	<i>Achievements of objectives in the shortest time</i>	<i>Simple and intuitive data structure</i>	<i>Need for quick results</i>	<i>Direct and distant communication is considered more efficient</i>	<i>Minimal and essential sounds, images and languages</i>
Uncertainty Tolerance	<i>Novelty, unusual references, abstraction that sends indirect messages</i>	<i>Tolerance for a complex ambiguous layout, without a defined logic</i>	<i>Many options and paths available, complex navigation</i>	<i>Extensive use of animation</i>	<i>Not well defined or difficult to recognize</i>
Uncertainty Avoidance	<i>Family situations</i>	<i>Clearly structured layout, simple menus</i>	<i>Simple and intuitive</i>	<i>Few animations</i>	<i>Simple and clear</i>
Low Context	<i>Images promote values of an individualistic society</i>	<i>Simple and essential data and layout, minimalist style</i>	<i>Simple and direct navigation and search for information</i>	<i>Lower use of animations, mainly used to highlight text effects</i>	<i>Direct references to the product</i>
High Context	<i>Images promote values of a collectivist society</i>	<i>Many menus, sidebars and links that promote an exploratory approach</i>	<i>Opening new browser windows for each new page</i>	<i>High use of animations, bright colors, scrollbars</i>	<i>Many cultural references even without the representation of the product</i>

Context cultures, while Germans, Scandinavians, Anglo-Saxons and North Americans people are considered Low Context. Consequently, the results for the Scandinavian countries can be generalized for each low-context country, and the results obtained for Malaysia can be generalized for all high-context countries.

In addition, from the Hofstede's five cultural dimensions (PDI, IDV, MAS, UAI, LTO) and the study by Marcus and Gould [10] on cultural markers (value promotion, structure, navigation, interaction, appearance), we propose Table III, which represents the guidelines of web design in a multicultural perspective, according to the empirical evidences of our analysis. This table allows, for each country that has a certain value of the dimensions of Hofstede and that can be classified as low or high-context, to draw the implications of web design.

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