Cultural Differences across Governmental Website Design

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ABSTRACT
In this paper, we study the relevance of Hall and Hofstede's works to the web design beyond traditional domain areas like e-commerce, and advertising. Existing theories explain how design may be affected by cultural differences, and we explore how those differences can be seen in the government website design across Brazil, Russia, India, China, and US. We describe our findings confirming that differences exist, more so between China and US than the rest, and point out where cultural theories fail to explain the results, in particular for Brazil, Russia and India and finally, focus more on the differences between China and US.

Author Keywords
Culture; website design; design.

ACM Classification Keywords
H.5.2 [Information Interfaces And Presentation]: User Interfaces - Interaction styles;

General Terms
Human Factors; Design; Measurement.

INTRODUCTION

In 2001, Jim O'Neil, the chairman of Goldman Sachs, coined the acronym "BRIC". Expanded as "Brazil, Russia, India, and China" [13], the term is used to group four of the world's largest and fastest growing economies. By the year 2012, the world's population is expected to crest the 7 billion mark [16]. Almost 45% of these people are projected to live in BRIC countries [9]. As these countries continue to technologically develop, their presence and influence on the Internet will continue to grow.

Currently, the Internet is a decidedly western system. While, over 50% of the World Wide Web is written in English, only 27% of Internet users speak English as a first language [6]. These users, come from diverse geographic, ethnic, and cultural backgrounds and undoubtedly, expect different things and interact with the web in different ways. Many theories suggest that people behave differently in different situations due to their established cultural identity. Hofstede's "Software of the Mind" theory [8] and Halls' theory [7] discuss the implications of cultural backgrounds.

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In this paper we explore how these cultural differences affect the visual and informational design of the websites. More specifically, we are interested in how the design of the websites by the Governments of different cultures appears different.

This cross-cultural analysis of websites is in the form of a visual structural comparison of a single genre of websites. In other words, we compare different webpages of a single genre: Government websites and look if there are distinctive differences that correspond to the culture of the origin country. These comparisons involve multiple entities like the colors, the information flow, the navigational structure, and other elements described later.

This paper evaluates the validity of some of the established cultural theories as a source of explanation of how these cultural differences are reflected in the Government's designers' perspectives of the website designs of publicly accessible websites, hosted by the Governments. Hence, the contribution of this work is to discuss the variance of content layout, navigational structure, and use of multimedia elements across Governmental websites of five countries: Brazil, Russia, India, China, and US.

STUDY OF CULTURE IN WEB DESIGN

There has been some work in the direction of cross- cultural website visual layout comparison. For example Zhang et al. [17] puts forward design principles of Chinese websites by focusing on the following three graphic design language characteristics: systematic relationship equilibrium and symmetry; line is grace and curve is force; and unification of form change and stability. Cyr et al. [5] focused on color treatments across three culturally distinct viewer groups for their impact on user trust, satisfaction, and e-loyalty. To gather data, a rich multi-method approach was used including eye tracking, a survey, and interviews.

Marcus and Alexander [11] derived five cultural dimensions and design components based on questionnaires. Overall, they gave an understanding of the relationships linking the amount of white space, color, layout and imagery for specific countries when designing websites. In an article by Cook & Finlayson [3], the authors speak about the fact that different types of websites (e.g. news, social networks, business, etc.) should have different design principles after factoring in culture. Kim and Kuljis [10] focused on an investigation of web site design differences between two very different cultures (South Korea and United Kingdom). This article also looked at how the "collectivist" nature of the Korean society was reflected on their web bulletin boards.

Barber and Badre [1] devised a set of "cultural markers" in web design that can be used to describe the difference in design. Building on this, Zhao [18] conducted a comparative analysis of websites originating in China and United States. The measures took two categories, "design measures" and "content measures". The content measures evaluated things such as personalization (e.g. use of words such as 'I', 'my', 'you' and 'your"), organizational history, and organizational achievements. The design measures evaluated things such as low- and high-context communication (e.g. how direct or explicit the communication methods were). Overall, these articles and others like it provide a solid framework to build a relevant and robust evaluation method.

Following on the possibility of personalization is the ability to change and choose specific language as the mode of communication between the website owner or designer and the viewers. Besides the choice of the languages available in a website, quality is also an important factor for the language translation from the originally intended to the localized version for the users. Robbins and Stylianou [14] found that the Latin American websites studied by them offered a translation into at least one international language, while a much lower number from the websites studied from US/Canada offered a translation into another language.

The layout of the webpage elements like banners, menu placement, or search functions has been shown to vary according to the cultures. Marcus and Gould [12] have shown that organization and location of the pictorial information on a webpage can be related to the direction of the written script of the readers. Further, Sun [15] has found that low-context cultures like Germany prefer a structured and a logical layout, much like France as shown by Barber and Badre [1], which prefers a centered layout.

The Hall's dimensions can be further used to show the richness of communication media chosen by different cultures to exchange information online. High context cultures can be expected to prefer multiple, personal or richer modes of communication like face-to-face or online video, audio chat or telephone. On the other hand, low context cultures can be expected to use lesser personal mode of communication like e-mails. Robbins and Stylianou [14] have found significant difference between the Nordic countries (lower-context) and Japanese (higher-context) in choice of e-mail as the preferred mode of communication. Nordic countries were shown to have a higher preference (100%) for e-mails than Japan (80%).

Bernard [2] has shown that a clear and facilitated path to information using navigational aids or navigational structure is important for users to not get lost on the websites. This ties well with Hofstede's dimension of uncertainty avoidance, as evidenced by Marcus and Gould [12]. According to him, users from a high uncertainty avoidance culture would be unable to accept and deal with the unstructured, and unfamiliar information, norms, and rules. Thus, they would require a structured navigational layout, with navigational aides, of the websites. Conversely, low uncertainty avoidance cultures will be lesser affected by the lack of navigational structures and aides.

Marcus and Gould [12] have found that materialistic culture designers are more likely to use graphics and multimedia. This may be connected with Hofstede's dimension of masculinity as described by Cyr [4]. According to her, the more masculine societies would prefer more multimedia while lesser masculine societies would prefer lesser multimedia elements like videos, sound, or animation.

METHOD

We chose to study BRIC countries (Brazil, Russia, India, and China) and compare them with US because of their growing economic clout, and subsequently the increasing use of Internet across these countries at a rate higher than the rest of the world. It is, hence, imperative to understand the implications of design decisions made by the Government, and how they perceive their websites should look for the consumption by not just the users in those countries but also the expat population.

There are multiple reasons for choosing Government websites: Firstly, governments are empowered and may have the necessary financial freedom to create and maintain the websites. Secondly, government websites reflect a single genre of website designs which aim at information dissemination to the citizens of the respective countries. Thirdly, while it cannot be said with complete surety, it is highly likely that the government websites will not be outsourced for creation to external countries/cultures due to the sensitive nature of the information and for internal information control and security.

Next we created a coding scheme to extract relevant information from the raw data sources. The coding scheme is based on the one described by Cyr et al [17] and extended with other variables like number of pictures, and use of currency symbols. For easier data handling, the 45 metrics were classified into 8 categories: Language, Layout, Symbols, Content Structure, Navigation, Links, Multimedia and Color. Three Websites from three countries: Germany, Canada, and Japan were used as the training coding set by the 2 coders. The inter coder reliability, Chronbach's Alpha was found to be high (0.93). Next we looked for a set of 10 websites from each country belonging to the same departments/ministries of the government to hold the validity in the data set. The categories are Main portal, President's page, Supreme Court's page, Congress/Senate/ Parliament/Upper House, Treasury/Finance, Department of State/Foreign Affairs, Military, Commerce, Tourism, and Education. Of all the multiple departments held by the governments, only a few had a functional website. Thus, we chose these common 10 departments, which had a webpage and could be compared with each other. The results of coding these five countries (50 webpages) are shared next.

RESULTS AND DISCUSSION

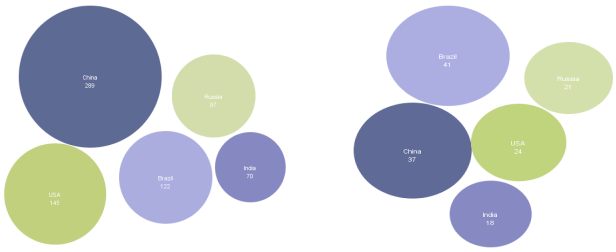


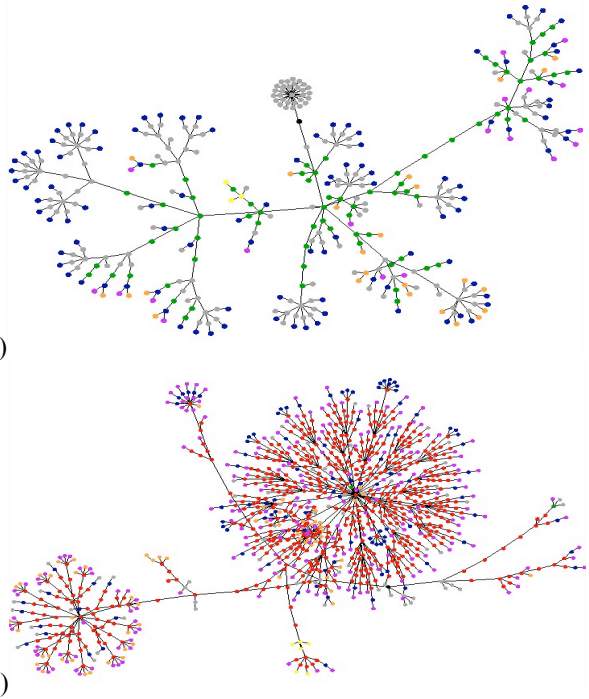
Figure 1 Count of Images (left) and Links (right)

As shown in Fig 1, China leads in the number of images used across the web pages. The higher context cultures depend upon the verbal and non-verbal cues to communicate effectively, represented by higher number of non-textual elements like images. China is categorized as high context culture, and the Fig1 (left) agrees with it. US on the other hand is categorized as low context culture, also evident from Fig 1 (left) with lower number of images. However, while Brazil, Russia, and India are higher-context cultures, the number of images the Government in these countries uses to communicate with its citizens is much lower to agree with this classification, unlike the results from Zhao [18]. Same holds for the number of internal links on a page seems to be far higher in China and Brazil vs. Russia, USA, and India. This could be because of growing westernization of the cultures, and reflecting in the design.

While Brazil, Russia, and India do not completely fit the suggested classification, China provides the strongest differences, most notably against USA. Brazil and Russia have English translations of their websites translated using Google and reflect the original layout, agreeing with Robbins and Stylianou [14]. China has websites reflecting the US website structure for their English versions, significantly different from the Chinese version, as shown in Fig 2. We believe that this is an important evidence to show how one culture (Chinese) finds it imperative to change its look to control the perception by others. On the other hand, it might be possible that the English webpage is newer and is hence designed using newer technologies. However, both the websites show the usage of exactly the same technologies: HTML, CSS, AJAX, and FLASH.

Figure 2 Comparing China's Chinese and English websites

The amount of uncertainty avoidance explains the difference in the number of nested tables and links in Chinese websites as compared to USA. In Figure 3, it is evident from the information architecture map of the main Government website of US & China, that US website prefers a different navigational structure than Chinese websites from the sparse Blue-dots representing links on a page, no tables represented by red-colored dots, scarcer images represented by pink dots. While this ties well with Bernard [2] and Marcus and Gould [12], does this reflect the Chinese Government's wish to communicate with its citizens using a relatively complicated and highly uncertain navigational structure as opposed to a simpler one in US?



a)

b)

Figure 3 Navigational Structure and Linkage between US (a) and China (b), links being Blue, Tables being Red, Images being Pink, and <Div> tags being Green

In high context cultures, higher bandwidth is needed to communicate. One can see this difference in the quantity and nature of information on the main portal of the Chinese and US Government, As shown in Figure 4, it is evident that US websites are shorter in length and give more specific textual information, compared to a longer length of links, providing a much lower context.

Figure 4 Comparison of left-rotated main portal of USA (left) vs. China (right) in terms of amount of text, and nature of text

CONCLUSION

In this paper we have shown how Hall and Hofstede's work can be used to compare website designs across governmental websites across multiple cultures and explain the differences, like information architecture and multiple language versions, that exist between them and found the strongest differences between Chinese and US government websites as compared to the other countries. Also, some other differences like use of images, and links have not found a suitable explanation in the previous research and needs further probing.

LIMITATIONS AND FUTURE WORK

We gathered our data from a restricted data set of 10 Government websites per country. So, one must be cautious when generalizing beyond the same. Also, the data has been collected only from the websites. This means that we cannot be completely sure about the culture and value system of the designers – while it is highly likely that the cultures and values should be compatible due to security issues. To counter this, we would like to do user studies with designers from China and USA and derive from interviews how the website designs might vary. Finally, we restricted our work to find explanation in Hall and Hofstede's works, ignoring to draw on the greater body of research to base our claims in explaining the differences, which we would like to pursue in future.

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