

Cultural Interface Design Advisor Tool: Research Methodology and Practical Development Efforts

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Abstract. Within the cultural user interface design research and development project we address the need in culturally appropriate user interface design that is brought up by globalization. Globalization is affecting most computer-mediated communication and, in particular, user interface design for the Internet applications. To address this need, we are building a cultural “look and feel” advisor tool that is based on the research study utilizing cultural analysis of a large number of websites for a particular locale. This paper addresses the research methodology we employed in manual evaluation of specific cultural markers on a large set of country-specific websites and reports on several important aspects of transferring our research results into the practical implementation of the cultural design advisor tool.

Keywords: Cultural preferences, color theory, cultural user interface, usability.

1 Introduction

Cultural appropriateness of user interface design directly impacts on the user’s perception of credibility, trustworthiness and user acceptance of websites. “Global businesses are losing market share worth as much as \$1.6 billion per year, or \$4.7 billion over three years, by failing to localize product information” (Forrester Consulting, 2008). Our background research shows that there is a lack of software development tools to support culturally sensitive user interface design. Availability of such tools will aid in broadening global business opportunities for small and medium size business enterprises (SME)s and help governments to inclusively provide electronic services to all segments of population including ethnic communities and recent immigrants.

In our research project we address the need in culturally appropriate user interface design that is brought up by globalization and is affecting most computer-mediated communication and, in particular, user interface design for the Internet, including e-business, eHealth and web-based advanced training and collaboration applications.

In our background research, in the onset of the project, we discovered that, in spite of the wealth of information available regarding the issues related to design of international user interfaces, it is not easy for Web designers and developers to acquire a deep cross-cultural understanding of user interface design. There is a number of existing cultural models and theories, which can be used to develop a set of broad cross-cultural

guidelines, similar to ones developed by Marcus and Gould [6]. However, this approach results in a mostly theoretical model of cross-cultural design, while the practical website development approach requires effective prototyping.

In our research we utilize a new approach to cultural user interface development. We are building a cultural “look and feel” prototyping tool that is based on the broad-based research study utilizing semi-automated analysis of a large number of websites for a particular locale. This tool is envisioned as an advisor tool that can aid software development teams in the quick production of the first draft of the cultural “look and feel” design. Data collection for the study was conducted using both automated and manual approach. The methodology and results of our automated data collection that involved around 36, 000 websites for 36 countries were described in detail in [4]. This paper addresses the research methodology we employed in manual evaluation of specific cultural markers on a large set of country-specific websites and reports on several important aspects of transferring our research results into the practical implementation of the cultural design advisor tool.



2 Manual Evaluation: Methodology

We conducted two research studies to investigate color and imagery selection and design trends on websites from around the globe. We studied the usage of specific cultural markers for website design using both automated cultural web mining tools and visual observations by human observers. The first study was completed in 2007 and utilized automated evaluation tools, such as a Cultural Web Spider tool (CWS) and color analysis and visualization tools [4]. The visual cultural markers we investigated in this study were colors, font usage, number of images, and layout of the webpage. Clearly, not all cultural markers could be automatically collected. By their nature, some cultural markers, especially those related to images, such as icons, flags, symbols, pictures related to geography, shape and architecture require involvement of human evaluators. This was accomplished in the design of the second study. The second study (currently in progress) utilizes novel evaluation methodology and a survey tool to further research design trends observed on a large number of website from different countries such as use of images, graphics, typography, as well as color.

2.1 Data Collection Methodology

For this research study, we chose the following design elements that would be analyzed by human evaluators: typography, graphics and layout, in combination with color. A survey tool was developed using these elements in general, as well as any relevant sub-category of each of the elements, adding up to twenty five different variables to be observed by human evaluators for each website (represented in Table 1). A sample of 100 out of 1000 websites, specific to a particular country, was examined in close detail by at least two human evaluators using this cultural visual design survey tool. Any indication of reoccurring trends was recorded. The trends observed were confirmed by researchers’ observations on the rest (around 900) of websites for a specific country. Based on the results of this evaluation work, some general and country-specific recommendations for culturally appropriate design were developed. These recommendations, along with research results from the first study and the results of the literature review, form a part of the content within the cultural design advisor tool.

Table 1. Survey tool categories

Colors	International 
	Country specific colors 
Typography	Type of fonts
	Colored fonts
Graphics	Number
	Types
Layout	Banners
	Menu location
	Use of white space
	Justification
	Number of columns
Culture	Holfstede's dimensions

2.2 Examination of Color Usage in Web Design

Color usage in web design was examined using country-specific color swatches identified by researchers based on the results from our initial web color usage study [6] and the application of the color theory [3]. In particular, the country-specific color preferences for a particular country were identified by removing the color hues that belonged to the “international” color palette (depicted in Figure 2) from data on total color usage obtained in our research study for a particular country, as shown in Figure 2 for Brazil.

white	
light gray	
gray	
dark gray	
black	
shaded blue	
dark blue	
medium blue	
light blue	
light yellow	

Fig. 1. “International” color palette

To obtain country-preferred color combinations, two top ranked country-specific colors were selected from the resulting color usage pie chart (Figure 3) and combined with their opposing or neighboring colors on the color wheel. The resulting choice of color preferences for a particular country was cross-referenced with the results of the ethnographic studies conducted by Cabarga [1]. Two color palettes (international and country-specific) were defined for each country and used by researchers in our manual evaluation to survey color usage in web design to a deeper level. It is important to note, that, as we found through our visual observations, in some countries designers are using blue color predominantly in their domestic design palette (e.g. UK, Australia), this is why we incorporated shades of blue within the country - specific color palette for these countries.

2.3 Examination of Other Visual Cultural Markers

Of equal importance to the design of culturally appropriate web sites is the use of imagery in combination with layout. In our research, imagery included graphics, photographs of people or things, cartoons, maps, graphs, even banners that display

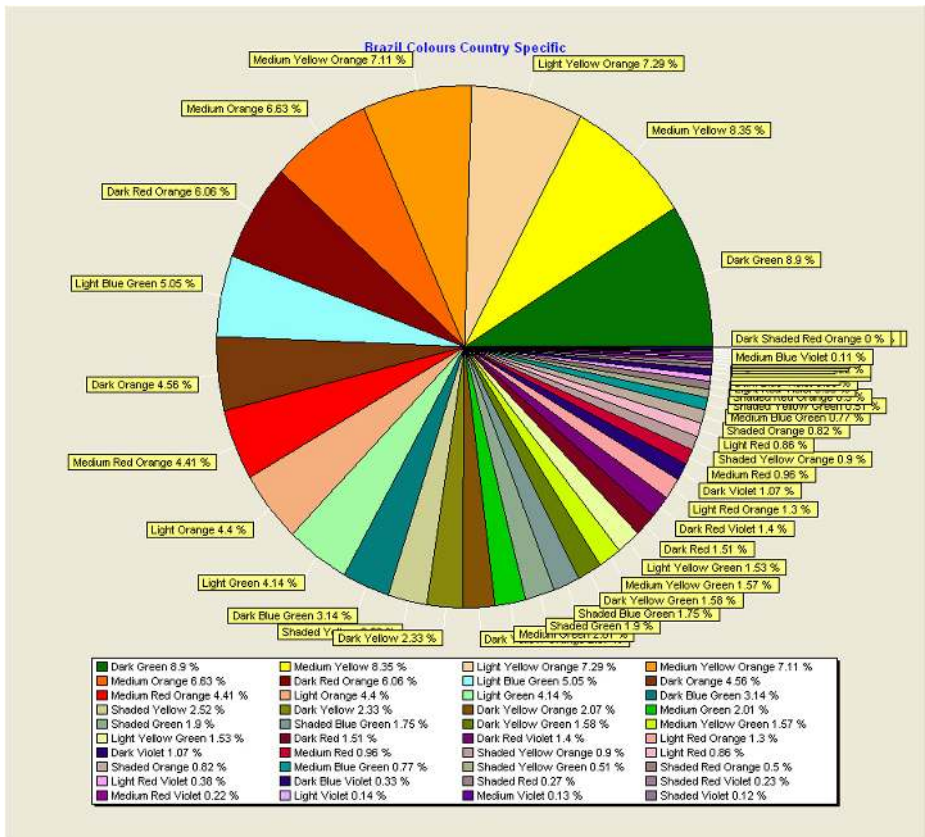


Fig. 2. Brazil country-specific colors pie chart

stylized fonts. In our survey tool we identified certain country-specific imagery preferences that can be attributed to cultural dimensions or attributes specific to the country. Within the imagery, we were looking for preferences in using images of people, people's close-ups, or images of "things" (e.g. buildings, landscapes, equipment, etc.).

In our manual evaluation process through visual observations of a representative set out of 900-1000 website per country, we also recorded visual design features based on Hofstede's cultural factor model [2], in particular on cultural factors such as Power distance; Uncertainty avoidance; and Masculinity vs. Femininity as reflected in the visual interface design. As per research done by Marcus [5], we measured power distance by site's focus on logos/seals or focus on people. When evaluating tendency towards femininity/masculinity dimension in visual design, we were looking for women's editions of popular websites. To estimate tendency to uncertainty avoidance factor, we were looking for navigation and the amount of links on the menu.

Predominant typography features on web pages for a particular country were examined as well. In particular, we paid attention to the usage of elaborate heading fonts, and recorded the usage of color in typography.

3 Implementation of Findings within the Advisor Tool

We are designing an advisor tool that could be used by Web developers and SMEs to aid in their production of the first draft of the cultural "look and feel" design for a particular locale. We want it to be used by the companies to help them in collaboration with clients in defining appropriate user interface and in balancing client preferences for product interface design with culturally appropriate design features. We believe that our tool would be especially useful for SMEs that want to develop software applications for international markets, but frequently do not have in-house internationalization/localization expertise or the budget to hire a professional localization company. This focus on SMEs defines the features of the tool.

Our advisor tool contains a step-by-step design guide, a set of cultural templates, as well as useful information on local culture, and results of our studies, including our findings on usage of color, imagery, fonts, and other observations. We envision that the tool could be used in the following fashion by potential users.

3.1 Usage of the Advisor Tool by Non-expert Designers

We see the advisor tool being used by non-expert designers (e.g. novice website developers or SMEs) in the following fashion. The designer can choose a region or a particular country directly from the menu. After this, the designer will follow the step-by-step design process, starting from the choice of design style, followed by the choice of color palette and typography. At the end of the process the designer will have a choice of a ready-to-go, culturally appropriate web template for a particular country, which is based on the choices made. The user can also skip the design process altogether and go directly to the set of templates prepared for a country and choose from them. These templates are created by a designer/researcher within the team and are deeply inspired by the results of the manual evaluation. Within the tool,

there is also plenty of supplementary information on our research findings for the country and on research results from others, this information can aid greatly in the decision process.

3.2 Usage of the Advisor Tool by Experienced Web Designers

We believe the advisor tool could be also useful for expert designers who are not familiar with cultural user preferences for a particular country. This especially relates to the choice of culturally appropriate color palettes. Since all our research results, including information on country specific color usage and preferred color palettes is incorporated within the tool, experienced designers will have all valuable data in their hands to support design decisions, including statistical results on color usage per country (Figure 2), average number of images per page, preference towards colored fonts, usage of white (empty) space, justification, menu placing preferences, image preferences.

4 Conclusions

The cultural interface design study investigates the usage of specific cultural markers for website design in a number of countries, in order to incorporate the results into a cultural interface design advisor tool. In particular, along with other visual markers, such as fonts, layout, number of images, we investigated usage of color for website design in different countries and developed recommendations for country-specific color palettes which are culturally appropriate. In our research, we utilized automated web data mining tools and complemented results with a manual evaluation of a representative number of the website per country. This methodology allowed us to: confirm results of automated evaluation; complement automated cultural data mining results with observations of researchers, and to develop a set of cultural web templates that are inspired by country-specific web design preferences.

An additional outcome of this research study is that we developed a suite of tools and research methodologies that could be used by researchers for conducting ethnographic and cultural studies on the Internet, by marketing and advertising companies to identify cultural trends for advertising and marketing purposes, and by web designers to design culturally appropriate web user interfaces.

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