CROSS-CULTURAL WEB INTERFACE DESIGN
---A COMPARATIVE STUDY OF CHINESE AND AMERICAN CORPORATE
WEB SITES

by
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This study identifies cultural differences upon web interface design of corporate web sites by conducting a content analysis of the web design features generated from Geert Hofstede's cultural dimensions. To achieve this goal, this study develops a series of web design evaluating standards that reflect cultural values.

Sixteen corporate web sites, eight from China and eight from the United states, are selected for the study to represent four main industries: telecommunication, petroleum, computer and banking. Four of Hofstede's cultural dimensions that are used as theoretical basis are: power distance, collectivism vs. individualism, femininity vs. masculinity, and long-term vs. short-term orientation. The results show that cultural influences are deeply inseminated throughout the web interface design of corporate web sites from different cultures. A complete understanding of the cultural differences and an effective implementation of cultural design will be essential for businesses' survival and growth nowadays and henceforward.

Headings:

      Web Interface – Design

      Web Interface – Culture

      Web Interface – China

      World Wide Web

      Cross-cultural study – Web interface

Table of Contents

1. Introduction

The Internet technology has caused fundamental transformation in the way corporations distribute products and services, conduct communication with, and disseminate information to, constituent groups, including customers, partners, and related institutes. People now widely agree that the Internet is a fruitful tool for commercial purposes (Huizingh, 2000). Just in the same way that people agree upon the importance of user interface design of any tangible products, professional researchers and designers advocate that well-designed web user interfaces that upgrade the performance of the web are equally vital for the survival and development of corporations in this cyber age, and henceforward. Self explanatory as it is, user interface design relies much on the user group. The web developer, whether designing a static web site that requires no user-side input, or building up a database driven web site that involves user interactions, always needs to be informed about their audiences' backgrounds, goals, and preferences. Among all the features that a designer needs to understand, cultural influence is one of the key factors for the success of web site design.

1.1. The Significance of Cultural Issues on the Web Interface Design

Some user interface design researchers have stated that web site design for effective performance is a creative and sophisticated process that combines intuition, experience, and careful consideration of numerous technical issues and

investigations (Nielsen, 2000; Sharma and Sharma, 2000; Sklar, 2000; Niererst, 1999). However, culture is still not yet listed as important as it should be. Studies in cultural design are still limited around identifying aesthetic stereotypes such as culturally preferred shapes or colors. As a result, inappropriate metaphors generated by cultural difference still may impede intended communication between the corporation and the targeted audience. Yet, it is also more and more recognized that cultural differences can represent a critical success factor in business (He, 2001). This reminds and stimulates many usability researchers and web designers to incorporate cultural preferences and biases, such as colors, spatial orientation, into web site design, along with the growth of the World Wide Web, in order to create user friendly web sites and improve the web performance.

Culture's importance is discussed in many fields of social studies, including sociology, social and organizational psychology, anthropology, and business and organizations. In the field of web user interface design, culture can be reflected in different forms of representations, certain methods of performing tasks, or even people's practicing patterns.

Take graphical features as an example. On the web, graphical features are increasingly important to support information and interaction between the corporation and the customer. Customers are interested in information, representing style and interaction with web usage depending on the amount of graphical components. In this way, graphical components support users' understanding and determination to purchase products from the web. Graphical components, like color and screen design directions, have different psychological

and social associations in different cultures (DelGaldo and Nielson, 1996). In addition, different users have different concepts of screen usage. Designing screens normally needs to consider that Latin-based screen design starts from the top-left-hand corner, while Chinese language can start from top-right-hand to bottom-left-hand or follow the Latin-based style. As a result web design applications need to be considered in localized settings with globalized information and content.

1.2. The Web Interface Design in China

Managing usability issue in a cultural context is even more significant when the targeted audience is from Asian countries, specifically China. While usability study is now growing and blossoming in countries like the United States and the United Kingdom, such research is still in its infancy in Asian countries like China. The idea of user interface design is news to not only the Chinese web site design discipline, but also those western experts who are trying to introduce western content to their eastern audience.

With approximately one-fifth of the world's population and a fast-growing economy, China needs to be given serious consideration in revising and developing concepts of user interface design. Geert Hofstede (1997), a prominent culture analyst, revised his cultural theory study to account for differences influenced by Confucian philosophy, the backbone of Chinese culture which has been impacting Chinese people's way of life and thinking for over five thousand years. He summarizes Chinese cultural principles as follows:

1. Stable society requires unequal relations.
2. The family is the prototype of all social organizations.
3. Virtuous behavior to others consists in not treating others as one would not like to be treated.
4. Virtue in relation to one's task in life consists of trying to acquire skills and education, working hard, being frugal, being patient, and persevering.

The purpose of this paper is to identify cultural influences upon web interface design by conducting a comparative study between Chinese and American corporate web sites.

2. Literature Review

Culture is defined differently by various disciplines. The conception of culture in this paper is somewhat loose, as described by Robbins and Stylianou (2003), "a set of values that influence societal perceptions, attitudes, preferences and responses". It is used as a means to show how people from certain cultural orientations view and interpret specific images and messages.

2.1. Culture and Web Design

Bourges-Waldegg and Scrivener (1998) distinguish cultural differences with two approaches: culturalization and cultural representation. The culturalization framework suggests that through the use of models with specific dimensions, web designers are able to enhance the design of usable web sites by evaluating differences between cultures. To work with this framework, the designer needs to build different versions of the same application according to the characteristics of the individual cultures. The cultural representation, which is more often used, builds common applications shared by users from different

cultures. In this framework, the basis of cultural differences is considered to reside in the representations used in the applications and the meaning conveyed by these representations.

There is not yet a specific set of rules that identify web design elements for designers and analysts to follow. Among the very few empirical studies that validate and evaluate comprehensive web site content and design feature, Robbins and Stylianou (2003) respectively carry out a study to address the problem of cultural influence in corporate web design. In the study they expand Huizingh's (2000) evaluation model and develop a conceptual model that differentiates web site content from design. By analyzing both the content and design components of 15 corporate web sites out of the 500 largest global corporations published by Fortune, they conclude that web site content is significantly different across national cultures, but only very minor differences are found by national culture regarding web site design. One of the limitations of this study, as recognized by the authors, is that the 4 Chinese corporations in the 500 sample pool are excluded because China is not included in Hofstede's country cluster originally. However, current global business cannot ignore the impact of China in every aspect, and this is also true in the field of user interface design for the World Wide Web.

2.2. Chinese and American Cultures

Many cross-cultural studies between the Chinese and American cultural differences focus on the psychological implications rather than on the practical impacts of culture on product and web design. One exception is Choong and

Salvendy's study on the Computer interfaces for people in mainland China. Choong and Salvendy (1999) investigate the effects of cultural differences on computer performance of Chinese and American users and concentrates on the design of appropriate interfaces for Chinese users. They base their study on the background psychological literature on the cognitive and cultural differences between the Chinese and the American populations. Chinese people present a thematic cognitive style, and tend to classify stimuli on the basis of their interrelationship and thematic relationships. The cognitive style of American people is functional, which means they "have a tendency to classify stimuli on the basis of functions" (Choong & Salvendy, 1999). To investigate these differences, Choong and Salvendy do an experiment involving 40 Chinese from mainland China and 40 Americans. Their study shows that Chinese users perform better with concrete representation and thematic structure available. The research results will benefit those corporations who have international users to address, like populations from China and the United States.

A more recent report on the topic of culture's role in user interface design in China is written by Marcus (2003) after the Fifth Asian-Pacific Computer-Human Interaction (APCHI 2002) conference, which took place in Beijing, China, November 1-4, 2002. Marcus believes that user interface designers need to consider the unique ways that Chinese people approach time, space, logic, communication, and interaction, which may affect user interface design principles and practices. These differences would influence design aspects, such as metaphors, mental models, navigation, interaction, and appearance. At the end of

the article, Marcus points explicitly that Westerners, who are eager to do business with the Chinese, need to embrace a more nuanced understanding of the diversity and extent of Chinese culture, instead of following the one-dimensional picture of the Chinese, which in many cases are American-biased.

2.3. Hofstede's Dimensions of Culture

One of the most often quoted cultural theorists is Geert Hofstede, a Dutch cultural anthropologist.   From 1978 to 1983, he conducted a landmark cultural study of hundreds of IBM employees in 53 countries. He developed four dimensions of culture by analyzing how patterns of acting, feeling and thinking are often ingrained in people by late childhood, and the differences in these cultural patterns displayed in the choice of symbols, rituals and values. Later in the 1990s, Hofstede published another version of this research in the book *Cultures and Organizations: Software of the Mind*, in which he added the fifth cultural dimension. Hofstede's five dimensions of culture include power-distance; collectivism vs. individualism; femininity vs. masculinity; uncertainty avoidance; and long- vs. short-term orientation.

The paper benefits from Marcus's study (2000) on Hofstede's culture theory. Marcus looks at how Hofstede's five cultural dimensions could be represented in web design, proposing that each dimension influences some aspects of web site design. However, he does not provide a close look at the relationship between each of these unique cultural features and concrete design applications. Moreover, because cultural dimensions vary along occupational

domains (Hong, 2000), Marcus's conclusions which are based on the comparison between government web sites or educational web sites cannot be applied to corporate web sites, the target genre of this paper. Therefore, for this paper, culture differences are approached through Hofstede's theory. Based on Hofstede's cultural dimensions, this paper develops a series of design features to reflect the significance of culture differences between Chinese and American corporate web site design.

Four of the five cultural dimensions will be used as the theory foundation: power distance, collectivism vs. individualism, femininity vs. masculinity, and long- vs. short-term orientation. Uncertainty avoidance is left out, because when Hofstede, working with Bond, added long- vs. short-term orientation as the fifth dimension, it cancels out some of the effects of uncertainty avoidance.

Although China is not included in Hofstede's development of the first four dimensions, China certainly falls into the Asian country cluster when Hofstede classified countries into six country clusters based on cultural commonalities and similar histories. So while the USA is in the Anglo group, it is believed that comparison can be made between these two countries based on the differences between the two country clusters. In addition the ranks of Hong Kong, Malaysia, and Singapore in these four dimensions are used as indicators for the potential rank of China. This is because these countries are also in the same Asian cluster with China, and share very close cultural features as mainland China for the major Chinese populations they possess.

The four of Hofstede's dimensions of culture and their implications in corporate web design are explained as follows:

2.3.1. Power Distance

Power distance (PD) refers to how much less powerful members depend on more powerful members of the group. In large power distance countries, like China, the dependence of subordinates on supervisors is considerable. Hofstede claims that large PD countries tend to have centralized political power and exhibit tall hierarchies in organizations with large differences in salary and status. Subordinates are expected to be obedient to supervisors and do as they are told. The statistics show that large PD countries tend to have larger populations, and/or lower gross domestic product (GDP) per capita than small PD countries. In small power distance countries, like the United States, subordinates depend less on supervisors, and there is a strong indication of interdependence relationship. Subordinates and supervisors are closer together and are more interchangeable. The hierarchical structure is flatter, with less difference in salaries and status.

In terms of corporate web site design, power distance may throw influence upon the following design aspects:

- Front page layout: highly structured with fewer categories (large PD) and links vs. less highly structured with more content presented (small PD).
- Front page space designation: relationship-oriented (large PD) vs. functional-oriented (small PD).
- Content political/social/moral implications: highly frequent (large PD) vs. less frequent (small PD).
- Use of slogan: highly frequent (large PD) vs. less frequent (small PD).

- Prominence given to leaders: frequent (large PD) vs. infrequent (small PD).
- Language style: official terminology (large PD) vs. active language (small PD).

2.3.2. Collectivism vs. Individualism

Collectivism deems that people are integrated into strong groups that protect them in exchange for loyalty. At work, collectivist cultures, which is dominant in China, value training, physical conditions, skills, and the intrinsic rewards of mastery. Hofstede found out that such societies and governments place collective social-economic interests over the individual, and profess the ideologies of harmony, consensus, and equality. On the other hand, individualism in a country reflects a person's strong sense of self. Individualistic cultures, represented by the United States in this study, value personal time, freedom, challenge, and extrinsic motivators such as material rewards at work. Their societies and governments place individual social-economic interests over the group, and profess the ideologies of self-actualization, self-realization, self-government, and freedom.

Reflected in corporate web site design, collectivism and individualism may have influence upon the following design aspects:

- Demonstration of group success and achievements: frequent (collectivism) vs. infrequent (individualism).
- Demonstration of individual success or stories: infrequent (collectivism) vs. frequent (individualism).
- Presentation of corporate culture: frequent (collectivism) vs. infrequent (individualism) use.
- Use of "I" and "you" in organizing web content: infrequent (collectivism) vs. frequent (individualism) use.

- Availability of individual access: infrequent (collectivism) vs. frequent (individualism) use of login session to protect users' privacy.

2.3.3. Femininity vs. Masculinity

In Hofstede's cultural dimensions, femininity and masculinity are defined as gender roles, not physical characteristics. He maintains traditional views of gender differences, in which feminine roles are oriented to home, children, people, and tenderness, and masculine roles to assertiveness, competition, and toughness. In terms of work, although different professions are dominated by different genders, high-femininity cultures, like those of China, tend to blur the lines between gender roles, while high-masculinity cultures, like those of the United States, display traditional distinctions. Consequently, femininity cultures put emphasis on values like good relations with supervisors, peers, and subordinates, good living and working environments, and the sense of security in employment, while masculinity cultures focus on goals like earnings, recognition, advancement, and challenges.

Hofstede's dimension of femininity vs. masculinity, when applied in web site design, provides the following clues for designers to ponder:

- Navigation control: loose (femininity) vs. strong (masculinity) navigation control.
- The function of the non-text content: aesthetic/emotional appeal (femininity) vs. for utilitarian purposes (masculinity).

2.3.4. Long-term vs. Short-term Orientation

Shortly after Hofstede first formulated his cultural dimensions, Michael Bond convinced him that a fifth dimension needed to be defined, which is now known as long-term orientation, an important cultural pattern in Asian countries that has been influenced by Chinese Confucian philosophy over thousands of years. After a survey specifically design for Asian countries, Hofstede and Bond concluded that these countries, with the same Confucian philosophy background as China, are oriented to the search for virtuous behavior while western countries, like the United States, are more oriented to the search for truth.

This conclusion, when applied in web design practice, is expected to be shown in the following ways:

- Patience demanding in achieving results and goals: heavy patience demanding (long-term orientation) vs. quick results demanding (short-term orientation).
- Availability of the user education, research, and support: infrequent (long-term orientation) vs. frequent availability (short-term orientation).

3. Methods

The purpose of this study is to investigate the ways cultural differences might affect the user interface design of corporate web sites. Instead of different language versions of the same corporation, only the corporation headquarters' web sites are used for the comparison study between Chinese and American corporations. Two reasons are offered here to support this corporation selection method: 1) it is understandable that a particular culture is better conveyed in its

own language by/to its own people than in another language by/to people from

another nation; 2) some corporations, while developing their web sites to address

overseas audiences, merely translate the text content of the original site, without

making any changes in design, either to achieve a unanimous outlook in different

locations, or simply for design convenience. These facts make the study on the

same corporate web sites with different languages difficult and unpredictable.

Thus, only the corporate headquarters' official web sites are selected in this study.

The Chinese and American corporations included in this study were

selected from the latest company ranking of Fortune Magazine as of October 2003.

This source was used because, having financial and human resources to develop

and maintain fully-featured web sites, these large companies are believed to be in

a more justifiable position to provide leadership in the use of information

technology than other companies from the same countries. This is especially

important in observing the situation in China, where information technology, and

the application of the web are still in its nascent stage.

Chinese corporations in this study were generated from the China 100

(from August 14th, 2003 issue), which actually lists the biggest 62 corporations

with a combination of all industries in China. Correspondingly, the first 62

American corporations of 2003 Fortune 500 (from the April 14th, 2003 issue)

were used as the American corporation pool in this study. In this way,

corporations from both countries were at the same level in terms of their

contribution to their national economy respectively.

A closer look at the different corporate industries also implies the necessity to cluster corporations according to their industries during the study. Differences in web design caused by industries cannot be ignored. In order to reduce such discrepancies, only the industries that are present in both countries in the first 62 groups are adopted. Consequently, four industrial groups were generated; they are telecommunications, petroleum, computer, and banking. For every of these four industrial groups, two representative corporations from each country were chosen for this study.

The result of this industrial grouping shows that, on the one hand, the diversification of industries in the US is more advanced than it is in China, and on the other hand, differences still exist in the development of different industries in each of these countries due to differences in political governance, historical influences, social values, and economic structures. For example, the industry of "iron and steel" actually ranks first in the China 100 list, which means the number of corporations under this category is the greatest on the China's corporation list. Yet, there is no equivalent category in the commensurate American list. The same situation occurs for the industry of "general merchandise" in American corporation list, as no similar category cannot be found in the Chinese corporate list.

In October 2003, 16 largest corporations, 8 from China and 8 from the USA, were selected and studied (Table 1).

Chinese Corporation	American Corporation	Industry
China Unicom	Verizon Communications	Telecommunication
China Mobile	SBC Communications	Telecommunication
PetroChina	Exxon Mobil	Petroleum
Sinopec Zhenhai	ConocoPhillips	Petroleum
Lenovo	Intl. Business Machines	Computer
Great Wall	Microsoft	Computer
Shanghai Pudong Development Bank	Citigroup	Banking
China Minsheng Banking Corporation	Bank of America	Banking

Table 1: Corporation and Industry

Content analysis was conducted to explore the content and design

components of each web site. Based on Hofstede's cultural dimensions, web

design features that reflect cultural influences are listed in Table 2, and 23

variables relating to these design features were further developed.

Dimension	Design Feature
Power Distance (PD)	Front page layout
	Front page space designation
	Content with political/social/moral implications
	Use of slogan
	Prominence given to leaders
	Language style
Collectivism vs. Individualism (CI)	Demonstration of group success and achievements
	Demonstration of individual success or stories
	Presentation of the corporate culture
	Use of "I" and "you"
	Individual access
Femininity vs. Masculinity (FM)	Navigation control
	The function of the Non-text content
Long-term vs. Short-term Orientation (LS)	Patience demanding
	Availability of the education, research, and support

Table 2: Hofstede's Cultural Dimensions and Their Implications on Web Design Features

 4. Data Collection

The presence, absence, and the value of each design variables were recorded. The web sites were viewed by using Internet Explorer 6.0 on a 15.0 XGA (measured diagonally) screen, screen resolution 1024 x 768 pixels, cable connection 100.0 Mbps.

4.1. Power Distance Variables

A.   *Front page layout*

    a) *The number of front page links.* This is done through the common measure of counting whenever the arrow changed to a pointing finger over a hyperlink. Each hyperlink is counted individually, even if it leads to the same web page.

    b) *The number of clicks from the front page to the last page of the web site.* This is a count of the clicks from the front page of the web site to the last page, in a vertical direction. This count is based on the hierarchical structure of the web site presented in the site map, if there is one. The hierarchy of the web pages is identified in a very strictly manner. In addition, the idea of "last page" in this study is simplified to the web page that requires no interactive action from the end user. That is to say, the page that requires user login is not counted.

B.   *Front page space designation*

    a) *Front page space use.* This variable represents the pictorial representation of the main theme of the front page. Is the main space

of the front page used to present categories of the site, news of the

corporation, or simply the corporate images? Although many sites use

more than one function of these three representations, each web site is

categorized into only one of these three groups according to the most

distinguishing feature it represents.

C. *Content implications*

a) *Ratio of news with political/social/moral implications.* Each piece of

news is identified as either with or without implications. This variable

shows the ratio of news with political/social/moral implications to

general corporate news without such implications. It reflects the

ideological values underlying the news. This variable may involve the

subjectivity of the study designer.

D. *Use of slogan*

a) *Presence or absence of the slogan.* The record of the presence or

absence of the corporate slogan is limited to the slogan shown on the

front page of the web site. The slogan may be composed of a few

phrases that summarize the value or the mission of the corporation.

E. *Prominence given to leaders*

a) *The number of leader names presented on the web site.* The

introduction to leaders of the corporation is often found in the

corporation information category of the web site. If the same leader's

name appears more than twice in different places of the web site, it

will only be counted once.

b) *The number of clicks from the front page to the leader's page.* This is a count of the clicks from the front page of the web site to the first page that introduces the leader(s), in a vertical direction.

F. *Language style*

a) *The style of language used in the category of corporate biography.* The language is categorized into two styles, official or active/personal. Each site is only assigned to one style of these two, either official, or active/personal. Again, similar to "content implications", results of this category might be subjective to some extent.

Design Feature	Variable
Front page layout	The number of front page links
	The number of clicks from the front page to the last page of the web site
Front page space designation	Front page space use
Content implications	Ratio of news with political/social/moral implications
Use of slogan	Presence of absence of slogan
Prominence given to leaders	The number of leader names presented on the web site
	The number of clicks from the front page to the first page of leader's introduction
Language style	The style of language used in the category of corporate biography

Table 3: Power Distance Variables

4.2. Collectivism vs. Individualism Variables

A. *Demonstration of group success and achievements*

a) *Presence or absence of group awards.* This records the presence or absence of organization or group awards of the corporation. On the web page, it is usually called "awards" or "honors".

b) *Ratio of group images*. This is the ratio of the number of images that represent the corporation to that of the images of the whole site. This is the result of the percentage of the group images of the web site out of the total number of all images of the site. Because mostly the corporate web sites use a large amount of images on their web sites, the image numbers used here are calculated based on the counting of images of only a certain number of web pages throughout the web sites, instead of a solid counting of every web page of the sites.

B.   *Demonstration of individual success or stories*

a) *Presence or absence of individual awards*. Similar to what is recorded in "group awards", this item shows the presence or absence of individual employees' awards or honors.

b) *Presence or absence of individual statements or stories*. Is there any statement or story told by employees of the corporation?

c) *Ratio of individual images*. This is the ratio of the number of images of any individual other than leaders to that of images of the whole site. Again, the counting of the images is based upon the calculation of a certain number of web pages due to the size of some corporations.

C.   *Presentation of corporate culture*

a) *Presence or absence of the category of "corporate culture"*. Is there a category of "corporate culture", which highlights the values and spirit of the corporation?

D.   *Use of "I" and "you"*

a) *Use of "I" and "you" in services and products categories*. What is more often used in the language of services and products categories, official, negative tones or active tones with a lot of "I" and "you"? Similar to the feature of language style in the above-mentioned power distance group, the measurement of this item may be subjective.

E.   *Individual access*

a) *Presence or absence of login sessions*. This shows if the web site provides users with login sessions so that they can have access to their private information. This includes private sessions for both employees and customers.

Design Feature	Variable
Demonstration of group success and achievements	Presence or absence of group awards
	Ratio of group images
Demonstration of individual success or stories	Presence or absence of individual awards
	Presence or absence of individual statements or stories
	Ratio of individual images
Presentation of corporate culture	Presence or absence of the category of "corporate culture"
Use of "I" and "you"	Use of "I" and "you" in services and products categories
Individual access	Presence or absence or login sessions

Table 4: Collectivism vs. Individualism Variables

4.3. Femininity vs. Masculinity Variables

A.   *Navigation control*

a) *Presence or absence of resource links*. This shows if the web site has the links that will lead to corporations or organizations other than its related sites, like those of its branches.

b) *Presence or absence of search boxes*. This variable indicates if the web site provides search function or not.

B.   *The function of the non-text content*

    a) *The ratio of functional graphics.* This is the percentage of graphics with functions, like linking to another web page, opening an audio or video file, out of the total number of graphics of the web site. To some corporate web sites in this study, these numbers are calculated based on a certain number of web pages, instead of the counting of the whole site.

Design Feature	Variable
Navigation control	Presence or absence of resource links
	Presence or absence of search boxes
The function of the non-text content	The ratio of functional graphics

Table 5: Femininity vs. Masculinity Variables

4.4. Long-term vs. Short-term Orientation Variables

A.   *Patience demanding*

    a) *Front page download time*. The measurement of the corporate front pages download time is recorded at a cable connection with the speed of 100 Mbps. Although cookies are used by most corporate web site, the measurement is done under the same condition, and the results are thus useable in the following comparison.

    b) *Front page largest image size*. This is a simple record of the largest image size on the front page of the web site.

c) *Front page total image size*. This is an accumulative number of all image sizes on the front page.

B. *Availability of education, research, and support*

a) *Presence or absence of web site technical support*. This variable shows if the corporate web site provides the users with technical support for using the web site. It does not include the service or the support of the product of the corporation.

Design Feature	Variable
Patience demanding	Front page download time
	Front page largest image size
	Front page total image size
Availability of education, research, and support	Presence or absence of web site technical support

Table 6: Long-term vs. Short-term Orientation Variables

5. Findings and Discussion

The intention of the study is to examine how cultural backgrounds could influence web interface design performance of both Chinese corporations and American corporations. Based on Hofstede's clusters of countries, China belongs to the cluster of countries with larger power distance, stronger collectivism values, stronger femininity values, and long-term orientation, and American corporations are placed in the cluster of countries that show characteristics of smaller power distance, stronger individualism, stronger masculinity, and short-term orientation.

5.1. Power Distance Influence Results

A. *Front page layout*

a) *The number of front page links (Table 7).* The mean (m=52.75) of the number of front page links for Chinese corporations is smaller than that (m=67.63) for the American corporations. This result shows that Chinese corporations show fewer links on the front page of their web sites than the American corporations do. It is also noted that Chinese corporations often present hyperlinks to other organizations or companies on their front pages, but this is not a common strategy for most American corporations in this study. Chinese corporations, under the influence of larger power distance, tend to have a tighter structure in the organization of information by providing fewer choices on the very top level of web page design. American corporations, on the contrary, present a looser structure style on their front page design by showing more choices to users.

	Mean	**Std. Deviation**
Chinese Corporations	52.75	16.490
American Corporations	67.63	34.616

Table 7: The number of front page links

b) *The number of the clicks from front page to the last page of the website (Table 8).* Chinese corporations have a mean of 4.5 as the number of clicks from the front page to the last page of their web sites, and the American corporations have a mean of 3.75. This number actually shows how many layers there are for the corporate web sites as a whole. Although the number for Chinese corporations is only slightly higher than that for American corporations, it still suggests the influence of power

distance in web page design, especially when the size of the corporative web site is taken into account. For example, the sizes of Lenovo and Great Wall, which rank as the top corporations in computer industry in China, are considerably smaller than those of IBM and Microsoft, which are the leading figures in the computer industry across the world. Bearing this in mind, one is convinced that because of the influences of large power distance, Chinese corporations, caring more about hierarchical structure, organize information into more layers than American corporations. American corporations, under the influence of small power distance, have a flat hierarchy in structuring information, and thus show fewer layers of web pages in their web site design.

	Mean	Std. Deviation
Chinese Corporations	4.50	.926
American Corporations	3.75	.707

Table 8: The number of the clicks from the front page to the last page of the website

B.   *Front page space designation*

a) *Front page space use.* In Table 9, value 0 shows that the front page is mainly used to present the categories of the whole site; value 1 shows that the front page is either used to show the corporate images or to list the corporate news. The result shows that 75 percent of Chinese corporations use the front pages to show either the corporate images or the corporate news, and only 25 percent use their front pages to present categories of the site. Yet, 87.5 percent of American corporations studied dedicate their

front pages for the purpose of categorization, and only 12.5 percent show

the corporate images or news as the main value on the front page. The

designation of front page is also a variable to show the cultural value of

power distance. The category of a web site is like the table of content of a

book. Large power distance countries would enlarge the distance between

the corporation and the customer by adding a cover page for this book,

while small power distance countries are more function-oriented and

would try to catch the attention of the audience with some concrete

information, like the "table of contents". This explains why more Chinese

corporations use the front pages for purposes like corporate images or

news to enhance the appearance of the corporation, and American

corporations are more likely to use the front pages of their web sites for

categories of the content.

	Value	Frequency	Percent
Chinese Corporations	0	2	25
	1	6	75
American Corporations	0	7	87.5
	1	1	12.5

Table 9: Front page space use

C.   *Content implications*

a) *Ratio of news with political/social/moral implications(Table 10).* The

mean (74.75) of the ratio of news with political/social/moral implications

for Chinese corporations is much higher than that (18.50) for the

American corporations. The statistics show that the Chinese corporation is

more likely to show the news of the corporation from a political point of
view, and its connection with the community and society. On the contrary,
American corporations, talking less from a political or moral point of view,
focus on the facts of the corporate development, like the introduction of a
new service, or the progress of a product research. The results of this
variable for the two countries are consistent with their characteristics of
power distance respectively.

	Mean	Std. Deviation
Chinese Corporations	74.75	15.443
American Corporations	18.50	14.501

Table 10: Ratio of news with political/social/moral implications

D.   *Use of slogan*

a) *Presence or absence of slogan(Table 11).* Value 0 in Table 11 stands for
the absence of a slogan on the front page of the corporate web site, while
value 1 stands for the presence of a slogan. A slogan is often used in
organizations that emphasize power distance to highlight the image of the
organization. The result shows that 62.5 percent of Chinese corporations
present slogans on their front pages as an indication of large power
distance, and only 25 percent of American corporations use slogans. The
content of the slogan is another indication of power distance, which cannot
be differentiated from the data collected. With larger power distance, the
content of the slogan, somehow similar to that of the above-mentioned
news, shows more political or social implications, like "the source of
energy, the need of society" from Sinopec Zhenhai Refining and Chemical

Company Limited. Slogans from smaller power distance, like "Make

progress everyday" from Verizon, is more like an every day phrase, with

little political or social significance.

	Value	Frequency	Percent
Chinese Corporations	0	3	37.5
	1	5	62.5
American Corporations	0	6	75
	1	2	25

Table 11: Presence or absence of slogan

E. Prominence given to leaders

a) *The number of leader names presented on the web site(Table 12).*

Presumably, the larger the power distance, the more the prominence given

to leaders. Yet the mean of the number of leaders from Chinese

corporations, 17.38 in Table 12, is actually smaller than the mean from

American corporations, 35.63. This suggests that fewer leaders are

introduced through the corporate web sites in China than in the USA.

However, a closer look at the organizational structures of the two

countries tell us that in China, power is more centralized, and in the USA,

power is more distributed. As a result, even for the corporations of the

same size, more managerial positions are expected to exist in the USA

than in China. Additionally, the standard deviation of this variable for

American corporations is larger than that for Chinese corporations. The

variance occurs in Microsoft's executive managers' pages, where 106

executives are listed as its business leadership team. From the result of

Table 12, it is concluded that a simple look at the number of leader names

on the web site could not tell the influence of power distance.

	Mean	Std. Deviation
Chinese Corporations	17.38	16.080
American Corporations	35.63	40.956

Table 12: The number of leader names presented on the web site

b) *The number of clicks from the front page to the leader's page(Table 13).*

On average, it takes 1.25 clicks from the front page to the leader's page for

Chinese corporations, and 2 clicks for American corporations. Supported

by the statistics of the variable of the front page to the last page clicks,

which show a deeper hierarchical structure of Chinese corporations and a

flatter hierarchical structure of American corporations, this variable

suggests that Chinese corporations show more prominence to leaders by

making the leaders' page more accessible for users than their American

corporations do.

	Mean	Std. Deviation
Chinese Corporations	1.25	.463
American Corporations	2	1.414

Table 13: The number of clicks from the front page to the leader's page

F. Language style

a) *The style of language used in the category of corporate biography(Table*

14). The category of corporate biography is where a corporation talks

directly to the public about itself. It is believed that corporations with

larger power distance would refer themselves by using the third person

tongue to increase their distance from the audience. Corporations with

smaller power distance tend to use more active language, like the

application of the first person tongue. In accordance with this theoretical

presumption, seven out of eight Chinese corporations use very standard

and official language in introducing themselves, and seven out of eight

American corporations do the opposite by applying a more active

language style.

	Value	Frequency	Percent
Chinese Corporations	0	1	12.5
	1	7	87.5
American Corporations	0	7	87.5
	1	1	12.5

Table 14: The style of language used in the category of corporate biography

5.2. Collectivism vs. Individualism Influence Results

A.   Demonstration of group success and achievements

a) *Presence or absence of group awards (Table 15).* In Table 15, value 0

stands for the absence of the information of group awards, and value 1 is

for the presence of group awards information. Four out of the eight

Chinese corporations list the group awards information on their corporate

web sites. This is slightly higher than the result of American corporations.

Although the statistical number is not substantially distinctive, this result

still implies the tendency which matches the hypothesis made upon

collectivism vs. individualism cultural influence. As a collectivism-

oriented country, China emphasizes more on group honors than its

individualist counterpart, the US.

	Value	Frequency	Percent
Chinese Corporations	0	4	50
	1	4	50
American Corporations	0	5	62.5
	1	3	37.5

Table 15: Presence or absence of group awards

b) *Ratio of group images (Table 16)*. The ratio of the number of group

images is another indicator for a corporation's emphasis on collectivist

values. The mean (17.5) of the group images for Chinese corporations is

again higher than that (8.25) of American corporation, which supports that

group honors is more appreciated in a collectivist culture than in an

individual culture.

	Mean	Std. Deviation
Chinese Corporations	17.5	23.869
American Corporations	8.25	6.861

Table 16: Ratio of group images

B.   *Demonstration of individual success or stories*

a) *Presence or absence of individual awards (Table 17)*. Most Chinese

corporations investigated do not list individual employees' awards and

honors on their web sites, while 25% of American corporations choose to

do so. Influenced by collectivist culture, Chinese people believe that

individual achievement is only a part of group achievements, and it is

always a virtue for individuals to stand invisible behind the curtain of the group. Appreciating individual accomplishments, American people, on the other hand, feel more comfortable to talk about individual awards and honors, and are more likely to present them for public review. Keeping this in mind, one could understand the very low presence of individual awards available on Chinese corporate web sites, when compared with the American counterparts.

	Value	Frequency	Percent
Chinese Corporations	0	8	100
	1	0	0
American Corporations	0	6	75
	1	2	25

Table 17: Presence or absence of individual awards

b) *Presence or absence of individual statements or stories (Table 18).* The individual statements counted in this study do not include the corporate top leaders' greeting and introductory statements. The focus is on ordinary employees' stories. Although most corporate web sites do not have a category with the purpose to present individuals' stories that are related to the corporation, some corporations still present employees' statements and images on the side bar of some certain pages, like career information, or corporation information, to reveal the spirit of the corporations from an individual point of view. The result shows that only 12.5% corporations in China present their employees' stories to show the corporate culture from an individual perspective. This is a more common strategy in the US, with

62.5% American corporations care about showing individual statements

on the web sites.

	Value	Frequency	Percent
Chinese	0	7	87.5
Corporations	1	1	12.5
American	0	3	37.5
Corporations	1	5	62.5

Table 18: Presence or absence of individual statements or stories

c) *Ratio of individual images (Table 19)*. Unlike group images or leaders'

images, individual images include pictures of employees in work, or

pictures of targeted customers. The presence of such individual images

shows the corporation's concerns over the ordinary employees and the

customers. While Chinese corporations have a higher ratio of group

images, they certainly present less individual images than American

corporations. This observation, similar to the explanation given to the ratio

of group images, can be illuminated by the different cultural preferences

over collectivism and individualism by people from China and the USA.

	Mean	Std. Deviation
Chinese Corporations	7.63	8.717
American Corporations	28.75	12.080

Table 19: Ratio of individual images

C.   *Presentation of corporate culture*

a) *Presence or absence of the category of "corporate culture" (Table 20)*. It

is expected that collectivist culture would put more values on the

presentation of corporate culture than individualist culture. This is where

the corporation highlights its group values by illustrating the corporate

regulations, recording the corporate activities, and reinstating the

corporate mission statement or even righteousness. Yet, the findings show

that Chinese corporations and American corporations present no

difference in this item. Conclusions could be made as the variable of

"corporate culture" is not an indicator of cultural influence over the web

interface design between the two countries studied. Another possibility is

that the indicators of corporate culture on web pages are not sensitive

enough.

	Value	Frequency	Percent
Chinese Corporations	0	5	62.5
	1	3	37.5
American Corporations	0	5	62.5
	1	3	37.5

Table 20: Presence or absence of the category of "corporate culture"

D. *Use of "I" and "you"*

a) *Use of "I" and "you" in services and products categories (Table 21)*. The

result of calculation shows that only 25% of Chinese corporations address

the customers of their services and products in a more personal way by

using "I" to refer to the corporation, and "you" to refer to the customer. At

the same time, 87.5% of American corporations present this feature. It is

thus concluded that under the influence of collectivist culture, Chinese

corporations use more official and formal language style in introducing

their services and products. American corporations show their concerns

for individual users by addressing them directly when introducing services

and products.

	Value	Frequency	Percent
Chinese Corporations	0	6	75
	1	2	25
American Corporations	0	1	12.5
	1	7	87.5

Table 21: Use of "I" and "you" in services and products categories

E.   *Individual access*

a) *Presence or absence of login sessions (Table 22).* Login sessions,

providing the user with individual space, show the corporations' concerns

for the privacy of their users, including employees and customers. Seven

out of eight American corporations present login functions to their users,

availing them of online private space. However, it can hardly be ignored

that login sessions are more often used in the banking industry than in

other industries. Also, in China, where online commerce is not yet as

mature as it is in the US, login sessions are thus less required for the

design of web sites. These two considerations are beyond the influence of

culture, and may explain the current conditions in Table 22.

	Value	Frequency	Percent
Chinese Corporations	0	5	62.5
	1	3	37.5
American Corporations	0	1	12.5
	1	7	87.5

Table 22: Presence or absence of login sessions

5.3. Femininity vs. Masculinity Influence Results

A. Navigation control

a) *Presence or absence of resource links (Table 23)*. Femininity cultural

countries, including China, would cast less control over web users'

navigation by providing the users with external links which might lead

them away from the corporate site. Masculinity cultural countries, like the

USA, devote more efforts to control users' navigation. Not providing

external links, American corporations manage the users' browsing within

their corporate web sites. According to the study, 7 out of 8 Chinese

corporations and 1 out of 8 American corporations present hyperlinks to

partners' web sites. This result is consistent with the femininity vs.

masculinity cultural implication.

	Value	Frequency	Percent
Chinese Corporations	0	1	12.5
	1	7	87.5
American Corporations	0	7	87.5
	1	1	12.5

Table 23: Presence or absence of resource links

b) *Presence or absence of search boxes (Table 24)*. Search function

empowers users' browsing over the web site. It allows users to locate the

exact information they want by providing the user with an interactive

method of communication. Countries under the influence of femininity

culture, with less intention to facilitate users' navigation over the web site,

are less likely to provide search function on their web sites. Yet, findings

show that both Chinese and American corporations are furnished with the

search function on their sites. It is thus concluded that the variable of search function does not reflect cultural differences between the two countries. Search function is such a basic component of any site that it must be provided in any culture. Nonetheless, the efficiency of the search function is not tested in this study, which might be a variable that noteworthy in measuring the cultural influence.

	Value	Frequency	Percent
Chinese Corporations	0	0	0
	1	8	100
American Corporations	0	0	0
	1	8	100

Table 24: Presence or absence of search boxes

B. *Non-text content function*

a) *The ratio of functional graphics (Table 25).* Femininity-oriented countries, with less desire to show power and control, would be more likely to use graphics for aesthetic reasons than for utilitarian functions; and vise versa for masculinity-oriented countries. According to the study, for Chinese corporations, the mean of graphics with utilitarian functions is 18.38, and it is 43.38 for American corporations. This result supports the expectation that femininity-oriented countries tend to use graphics on their sites for aesthetic reasons than for utilitarian reasons.

	Mean	Std. Deviation
Chinese Corporations	18.38	20.942
American Corporations	43.38	25.961

Table 25: The ratio of functional graphics

5.4. Long-term vs. Short-term Orientation Influence Results

A. Patience demanding

a) *Front page download time (Table 26).* The average time to download the
home page of Chinese corporations is 20 seconds, and the average time for
American corporations is 5.63 seconds. Although it is largely because the
Internet technology is less advantageous in China than in the USA, this
slower pace of communication is also congruous with the long-term
orientation culture that is prevalent in China. Compared with Chinese
corporations, the short-term-oriented American corporations design their
home pages to help people achieve their goals as efficiently as possible.

	Mean	Std. Deviation
Chinese Corporations	20.00	5.182
American Corporations	5.63	1.847

Table 26: Front page download time

b) *Front page largest image size (Table 27).* The size of the images on the
front page is another strategy to control users' downloading time of the
pages. Long-term orientation countries would consider less about the
effect of image size in users' browsing than short-term orientation
countries. As a result, large size images are more often used in long-term
orientation countries. The findings of this study verify this cultural
influence, with the mean of Chinese corporations as 21.63 kilo bytes (KB),
and the mean of American corporations as 13.75 KB.

	Mean	Std. Deviation
Chinese Corporations	21.63	13.405
American Corporations	13.75	5.898

Table 27. Front page largest image size

c) *Front page total image size (Table 28)*. The accumulative number of all image sizes on the corporate home page is a similar variable with the above-mentioned variable of largest image size. For this variable, the mean for Chinese corporations is 99.38 KB, and the mean for American corporations is 57.88 (KB). Once again, Chinese corporations show higher demand for patience from their users by using large amounts of images on their home pages, which requires heavier workload on the user side.

	Mean	Std. Deviation
Chinese Corporations	99.38	52.375
American Corporations	57.88	31.543

Table 28 : Front page total image size

B. *Availability of education, research, and support*

a) *Presence or absence of web site technical support (Table 29)*. Providing technical support for the web site is a way to show the designer's concerns for the user's interaction with the site. Influenced by long-term orientation, the design of Chinese corporations' web sites requires their users to explore by themselves by providing little technical help throughout the navigation. No Chinese corporation studied presents this feature of help to their users. On the other hand, 62.5% American corporations, with the

influence of short-term orientation, care about providing technical support

for their users.

	Value	Frequency	Percent
Chinese Corporations	0	8	100
	1	0	0
American Corporations	0	3	37.5
	1	5	62.5

Table 29: Presence or absence of web site technical support

6. Limitations

Although the corporations selected from the two countries are both from

the Fortune's ranking of each country, the great discrepancy of the development

of economy and World Wide Web technology still exerts influences over both the

design and content features of the studied web sites. These are the factors other

than cultural influences, yet worth noticing in accessing the design of the web

sites.

Many of the variables studied in this paper rely on the presence or absence

of certain features. Though this is a valid first step, stronger conclusions could be

drawn by further studying the nature of these items, and the various ways that

they are implemented. Future studies could be designed to explore certain

variables in an in-depth manner, which is insufficient in this study.

7. Conclusion

The purpose of this paper is to investigate the ways cultural differences

might affect the user interface design of corporate web sites, with focus on China

and the USA. As discussed in the former part of this paper, the implications of

cultural influences of web interface design over different countries have great potential and require special consideration from designers and corporations who are preparing for a global growth of their business.

From the results of the findings of the eight design variables in the power distance section, the effects of cultural differences on corporate web interface design are eminent in terms of the front page layout, the front page space designation, the content implications, the use of slogan, the prominence given to leaders, and the language style. Pursuant to Hofstede's country clusters, China belongs to the countries with large power distance, and the USA is within the group of countries with small power distance. Correspondingly, Chinese corporations, compared with American corporations, tend to increase the distance between the corporation and their web users in the following aspects: the front page layout presents stronger hierarchical order; the space on the front page is more often used to show the corporate image, rather than to list the categories for users' navigation; the news is reported with more political/social/moral implications; the slogan is more often used on the front page to highlight the spirit of the corporation; more prominence is given to corporate leaders, and a more formal language style is adopted when introducing the corporation to the public. One exception among the variables is the number of leader names presented on the web site. Although a simple count of leader names reveals that fewer leaders are presented on Chinese corporation web sites than on American ones, this might be caused by the size of the corporation rather than by the influence of culture.

Yet, this result shows that the number of leaders introduced does not serve as a useful variable to show the cultural influence over the corporate web design.

From the eight design variables in the collectivism vs. individualism section, cultural influences are reflected in the demonstration of group success, the demonstration of individual success or stories, the presentation of corporate culture, the use of "I" and "you", and individual access that requires login. Chinese corporations will present more collectivist characteristics and American corporations will present more individualist characteristics. Accordingly, Chinese corporations are more likely than American corporations to show honors and awards of the group rather than of the individual. More group images are shown on Chinese corporate web sites, and less individual images or stories are told. On the contrary, American corporations give more prominence to individual efforts under the influence of individualist culture. Corporate culture is more often illuminated on Chinese corporate web sites than on American corporate web sites. In addition, Chinese corporations show little preference in using "I" and "you", which project the value of individualism, and American corporations choose to do so most of the time. Concerning individual privacy, American corporations provide login sessions to their users and promise them more access and rights of individual business, but their Chinese counterparts seldom do so. Still, it is important to understand that some of these variables may reflect differences in technology advance in these countries.

The four design variables in the femininity vs. masculinity section realize the cultural influences over the design aspects of navigation control and non-text

content control. Chinese corporations, with the characteristics of femininity culture, exert less control for the users' overall navigation. American corporations, with the characteristics of masculinity culture, show more concerns over the control of users' navigation. In practice, Chinese corporations, compared with American corporations, present more options for users to link to external links, and use graphics more often for aesthetic purposes than for utilitarian purposes. Search box is used frequently in both cultures, as it is a fundamental function of any web site. Thus this feature does not reflect cultural influences as it is hypothesized.

The section of long-term vs. short-term orientation contains four design variables that are used to reflect cultural differences in terms of patience demands and availability of education and support. Long-term orientation cultures required more patience from the user throughout the navigation, while short-term orientation considers the speed of the user's side and always tries to reduce the obstacles throughout the user's navigation. As a result, Chinese corporate web sites, with larger image size, often require longer downloading time than American corporate web sites. In addition, they provide little technical support to help users throughout their navigation, while their American counterparts are more likely to do so.

It is noticeable that China is now part of the World Trade Organization (WTO) and will emerge as an untapped market for many Western businesses. To face the potential of the growth of the Chinese market on the health of U.S. businesses, and the world as a whole, it is essential for both parties, China and the

rest of the world, to understand and incorporate each other at the cultural level. This study shows that Hofstede's typology of culture is still valid for current corporate web interface design. His five dimensions of culture could thus be used as one of the standard cultural theories in web interface design for most information professionals. Furthermore, regardless of national origin, cultural differences have always been something to overcome by most businesses in this technology-driven global economy.

8. Appendix A

Hofstede's Dimensions of Culture

	PDI		IDV		MAS		LTO	
	rank	score	rank	score	rank	score	rank	score
Arab Countries	7	80	26/27	38	23	53		
Argentina	35/36	49	22/23	46	20/21	56		
Australia	41	36	2	90	16	61	15	31
Austria	53	11	18	55	2	79		
Bangladesh							11	40
Belgium	20	65	8	75	22	54		
Brazil	14	69	26/27	38	27	49	6	65
Canada	39	39	4/5	80	24	52	20	23
Chile	24/25	63	38	23	46	28		
China							1	118
Columbia	17	67	49	13	11/12	64		
Costa Rica	42/44	35	46	15	48/49	21		
Denmark	51	18	9	74	50	16		
East Africa	21/23	64	33/35	27	39	41		
Equador	8/9	78	52	8	13/14	63		
Finland	46	33	17	63	47	26		
France	15/16	68	10/11	71	35/36	43		
Germany FR	42/44	35	15	67	9/10	66	14	31
Great Britain	42/44	35	3	89	9/10	66	18	25
Greece	27/28	60	30	35	19/19	57		
Guatemala	2/3	95	53	6	43	37		
Hong Kong	15/16	68	37	25	18/19	57	2	96
India	10/11	77	21	48	20/21	56	7	61
Indonesia	8/9	78	47/48	14	30/31	46		
Iran	29/30	58	24	41	35/36	43		
Ireland (Republic	49	28	12	70	7/8	68		

of)								
Israel	52	13	19	54	29	47		
Italy	34	50	7	76	4/5	70		
Jamaica	37	45	25	39	7/8	68		
Japan	33	54	22/23	46	1	95	4	80
Malaysia	1	104	36	26	25/26	50		
Mexico	5/6	81	32	30	6	69		
Netherlands	40	38	4/5	80	51	14	10	44
New Zealand	50	22	6	79	17	58	16	30
Nigeria							22	16
Norway	47/48	31	13	69	52	8		
Pakistan	32	55	47/48	14	25/26	50	23	0
Panama	2/3	95	51	11	34	44		
Peru	21/23	64	45	16	37/38	42		
Philippines	4	94	31	32	11/12	64	21	19
Poland							13	32
Portugal	24/25	63	33/35	27	45	31		
Salvador	18/19	66	42	19	40	40		
Singapore	13	74	39/41	20	28	48	9	48
South Africa	35/36	49	16	65	13/14	63		
South Korea	27/28	60	43	18	41	39	5	75
Spain	31	57	20	51	37/38	42		
Sweden	47/48	31	10/11	71	53	5	12	33
Switzerland	45	34	14	68	4/5	70		
Taiwan	29/30	58	44	17	32/33	45	3	87
Thailand	21/23	64	39/41	20	44	34	8	56
Turkey	18/19	66	28	37	32/33	45		
Uruguay	26	61	29	36	42	38		
USA	38	40	1	91	15	62	17	29
Venezuela	5/6	81	50	12	3	73		
West Africa	10/11	77	39/41	20	30/31	46		
Yugoslavia	12	76	33/35	27	48/49	21		
Zimbabwe							19	25

Legend:
PD: Power distance index
IDV: Individualism index
MAS: Masculinity index
UAI: Uncertainty avoidance index
LTO: Long-term orientation index

9. Appendix B

List of Chinese Corporations' Rank and Industry from the Fortune

Rank	Corporation	Industry
1	China Petroleum & Chemical	Energy
2	PetroChina	Energy
3	China Mobile	Telecommunications
4	Baoshan Iron & Steel	Metals
5	Legend Holdings	Computers
6	China Unicom	Telecommunications
7	Sinopec Zhenhai Refining & Chemical	Petroleum Refining
8	Sinopec Shanghai Petrochemical	Petroleum Refining
9	China Resources Enterprise	Beverages
10	CITIC Pacific	Wholesaling
11	Sinopec Yangzi Petrochemical	Petroleum Refining
12	China Southern Arilines	Airlines
13	Jilin Chemical Industrial	Chemicals
14	Huaneng Power International Holdings	Energy
15	Beijing Shougang	Metals, Electronics
16	Minmetals Townlord Technology	Trading
17	China Eastern Airlines	Airlines
18	Sichuan Changhong Electric	Energy
19	An'gang New Steel	Metals
20	Sinopec Kantons Holdings	Petrochemicals
21	TCL International Holdings	Electronics, Electrical Equipment
22	Jinzhou Petrochemical	Petroleum Refining
23	Konka Group	Electronics, Electrical Equipment
24	Yizheng Chemical Fibre	Chemicals
25	China International Marine Containers Group	Shipbuilding (containers)
26	Guangdong Midea Holding	Household Appliances
27	Ma'anshan Iron & Steel	Metals
28	Sinopec Beijing Yanhua Petrochemical	Chemicals
29	Shanghai Construction	Engineering, Construction
30	Eastern Communications	Telecommunications
31	Panzhihua New Steel & Vanadium	Metals
32	Beijing Urban Construction Investment & Development	Engineering, Construction

33	Qilu Petrochemical	Petroleum Refining
34	Bengang Steel Plates	Metals
35	Tangshan Iron & Steel	Metals
36	Wuhan Steel Processing	Metals
37	Shandong International Power Development	Energy
38	Chongqing Chang'an Automobile	Motor Vehicles
39	China Overseas Land & Investment	Engineering, Construction
40	Zhejiang Zhongda Group	Textiles, Garments
41	Harbin Pharmaceutical Group	Pharmaceuticals
42	Great Wall Technology	Computers
43	Gree Electrical Appliances of Zhuhai	Electronics, Electrical Equipment
44	Brilliance China Automotive Holdings	

(Due to access restriction at the time the Appendix B was composed based on the data obtained from the Fortune web site, Chinese corporations after rank 44 were no longer available.)

10. Appendix C

List of American Corporations' Rank and Industry from the Fortune

Rank	Corporation	Industry
1	Wal-Mart Stores	General Merchandisers
2	General Motors	Motor Vehicles & Parts
3	Exxon Mobil	Petroleum Refining
4	Ford Motor	Motor Vehicles & Parts
5	General Electric	Diversified Financials
6	Citigroup	Commercial Banks
7	Chevron Texaco	Petroleum Refining
8	Intl. Business Machines	Computers, Office Equipment
9	American Intl. Group	Insurance: P & C (stock)
10	Verizon Communications	Telecommunications
11	Altria Group	Tobacco
12	ConocoPhillips	Petroleum Refining
13	Home Depot	Specialty Retailers
14	Hewlett-Packard	Computers, Office Equipment
15	Boeing	Aerospace and Defense
16	Fannie Mae	Diversified Financials
17	Merck	Pharmaceuticals
18	Kroger	Food & Drug Stores
19	Cardinal Health	Wholesalers: Health Care
20	McKesson	Wholesalers: Health Care
21	State Farm Insurance Cos	Insurance: P & C (mutual)
22	AT&T	Telecommunications
23	Bank of America Corp.	Commercial Banks
24	AmerisourceBergen	Wholesalers: Health Care
25	Target	General Merchandisers
26	J.P.Morgan Chase & Co.	Commercial Banks
27	SBC Communications	Telecommunications
28	Berkshire Hathaway	Insurance: P & C (stock)
29	AOL Time Warner	Entertainment
30	Sears Roebuck	General Merchandisers
31	Procter & Gamble	Household and Personal Products
32	Freddie Mac	Diversified Financials
33	Costco Wholesale	Specialty Retailers
34	Johnson & Johnson	Pharmaceuticals
35	Albertson's	Food & Drug Stores
36	Dell Computer	Computers, Office Equipment
37	Pfizer	Pharmaceuticals
38	MetLife	Insurance: Life, Health (stock)
39	Kmart Holding	General Merchandisers
40	Morgan Stanley	Securities

41	Safeway	Food & Drug Stores
42	J.C.Penney	General Merchandisers
43	United Parcel Service	Mail, Package, Freight Delivery
44	Allstate	Insurance: P & C (stock)
45	Walgreen	Food & Drug Stores
46	Wells Fargo	Commercial Banks
47	Microsoft	Computer Software
48	Merrill Lynch	Securities
49	United Technologies	Aerospace and Defense
50	ConAgra Foods	Consumer Food Products
51	Dow Chemical	Chemicals
52	Marathon Oil	Petroleum Refining
53	Delphi	Motor Vehicles & Parts
54	Sprint	Telecommunications
55	Valero Energy	Petroleum Refining
56	Lockheed Martin	Aerospace and Defense
57	Prudential Financial	Insurance: Life, Health (stock)
58	Intel	Semiconductors and Other Electronic Components
59	Motorola	Network and Other Communications Equipment
60	Lowe's	Specialty Retailers
61	Walt Disney	Entertainment
62	PepsiCo	Consumer Food Products
63	UnitedHealth Group	Health Care
64	International Paper	Forest & Paper Products
65	New York Life Insurance	Insurance: Life, Health (mutual)

11. Appendix D

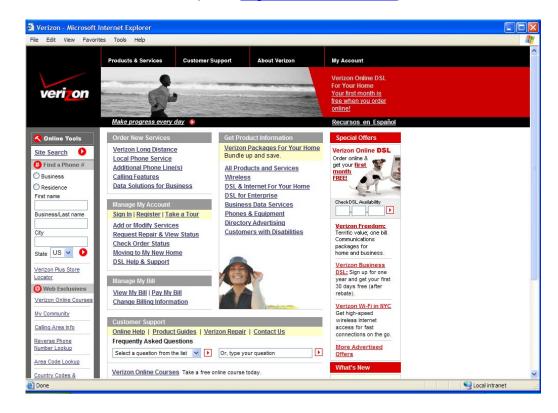Screen Shots for the Sixteen Corporate Web Sites Investigated

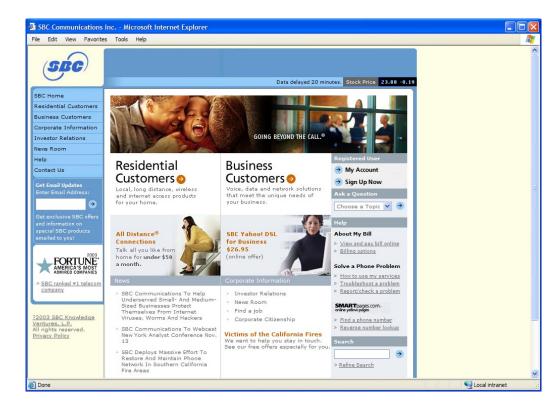China Unicom (URL: http://www.chinaunicom.com.cn)

China Mobile (URL: http://www.chinamobile.com)

Verizon Communications (URL: http://www.verizon.com)
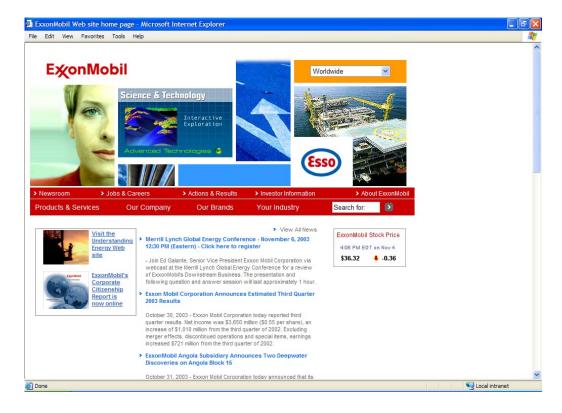
SBC Communications (URL: http://www.sbc.com)

PetroChina Company Limited (URL: http://www.petrolchina.com.cn)

Sinopec Zhenhai Refining and Chemical Company Limited (URL:
http://www.zrcc.com.cn)

Exxon Mobil (URL: http://www.exxonmobil.com)

ConocoPhillips (URL: http://www.conocophillips.com)

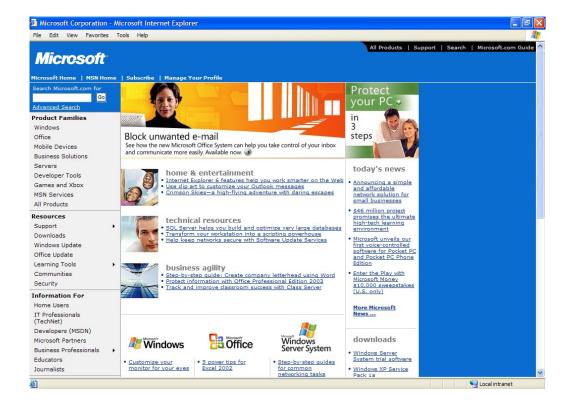Lenovo (URL: http://www.lenovo.com)

Great Wall (URL: http://www.greatwall.com.cn)

IBM (URL: http://www.ibm.com)

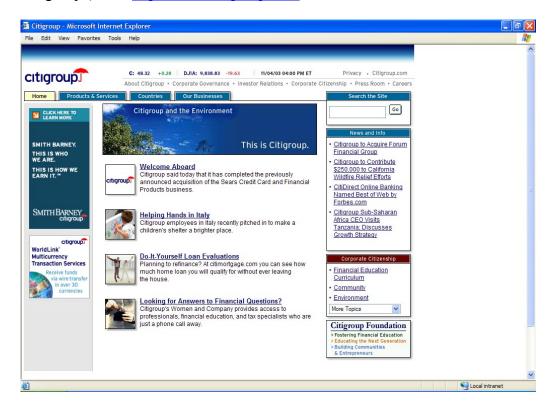Microsoft Corporation (URL: http://www.microsoft.com)

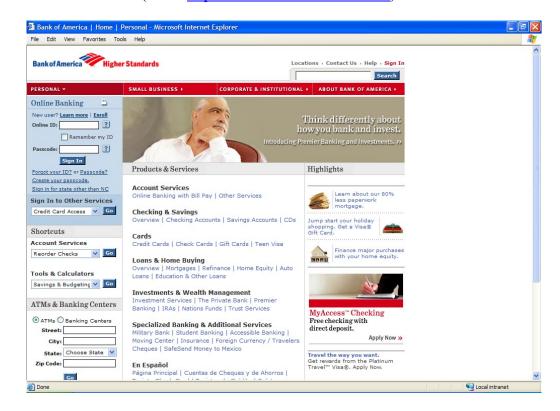Shanghai Pudong Development Bank (URL: http://www.spdb.com.cn)

China Minsheng Banking Corp., LTD. (URL: http://www.cmbc.com.cn)

Citigroup (URL: http://www.citigroup.com)

Bank of America (URL: http://www.bankofamerica.com)

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