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Impact of Culture on Information Systems Design and Use: A Focus on E-Business

31.1 Introduction

For many years, the impact of culture on information systems (IS) design and use has been recognized. Based on cross-cultural research, Ein-Dor et al. (1993) assess that IS are influenced by socio-psychological, demographic, and economic factors. The various factors are integrated into a research framework in which the most important finding is that culture has the potential to impact technical and procedural elements of IS greatly. Accordingly, there are numerous authors who suggest that a viable agenda for research links prior literature on international business and IS (Deans and Ricks, 1993; Niederman et al., 2012; Sagi et al., 2004).

A recent article by Niederman et al. (2012) is useful for assessing key topics in global information management. Based on a decade of research published in the Journal of Global Information Management, the authors designate 11 categories or topics that evolve from their investigation. These topics include: (1) adoption and diffusion of technology; (2) cultural variations; (3) e-commerce; (4) e-government; (5) information technology (IT) in developing countries; (6) IT in multinational firms to facilitate global operations and decision-making; (7) knowledge management; (8) managerial and worker actions, beliefs, and values; (9) national infrastructure; (10) offshoring of IS tasks; and (11) IS support of virtual...

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teams involving multiple cultures.* While these topics are not exhaustive, they do represent a snapshot of the field as evidenced by research published in a journal exclusively focused on global information management. Niederman et al. further note that there are overlapping concerns of international business and IS and that the relationship between international business thinking and global information management is complex. Each of these 11 topics is expansive and inclusion of them all within the scope of this chapter is not possible. However, extracting from these themes, the following pages are focused on areas designated by Niederman et al. (2012) as most significant and where there is greatest representation of research. These areas include e-commerce (or e-business as the terminology used in this chapter) and culture.

Studies of e-business consider characteristics of consumer use of IS functions and website offerings, user differences across cultures, as well as the impact of website design on e-business use. More specifically, this chapter will emphasize website design as the medium of communication in e-business. For several years, researchers have examined the effectiveness of website design related to culture, and the subsequent impact on user trust and e-loyalty in e-business (Belanche et al., 2012; Cyr, 2008a; Flávian et al., 2006; Sia et al., 2009; Smith et al., 2011). These investigations are a reasonable proxy for the impact of culture on IS design and use more generally. Therefore, this chapter aims to contribute to understanding website design elements, which facilitate e-business success in diverse cultural settings. Since a primary goal of e-business vendors is to solicit trust of online users, this topic is likewise discussed.

The chapter begins with a brief overview of e-business and national culture. This is followed by a discussion and research findings about culture and website design. More specifically, we focus on how elements of information design, navigation design, and visual design are influenced by culture. Since trust is central to e-business, this topic also receives attention in a cross-cultural context. In addition to the focus on research, the chapter covers the impact of culture and website design on practice. The chapter concludes with suggestions for future research challenges and new directions for research.

### 31.2 The Global E-Business Phenomenon

The rapid increase of Internet users globally is staggering. Equally impressive is the surge in the number of people shopping or searching for product information online. As of December 31, 2011, Internet users are over 2.2 billion strong, which represents 528.1% growth since 2000 (Internet World Stats, 2011). Of these Internet users, the majority reside in Asia (44.8%), followed by Europe (22.1%), North America (12.0%), Latin America/Caribbean (10.4%), Africa (6.2%), the Middle East (3.4%), and Oceania/Australia (1.1%). Remarkable statistics are the increase in penetration and growth in certain regions. For instance, in Africa the growth of Internet users is 2988% and in the Middle East growth is 2244% in the period from 2000 to 2011. The relative number of Internet users in North America is declining as the number of users in other geographical locations grows.

In 2008, over 875 million consumers had shopped online, up 40% from 2006. Among users with Internet access utilized for shopping, the highest percentage of online shoppers is found in South Korea (99%), United Kingdom (97%), Germany (97%), Japan (97%), and the United States (94%). The most popular and purchased items are: books (41%), clothing/accessories/shoes (36%), videos/DVDs/games (24%), airline tickets (24%), and electronic equipment (23%) (Multilingual Search, 2008). Based on Internet Retailer’s 2011 Top 500 Guide, one trend is evident—web-only merchants took business away from the rest of the market in 2010. Combined revenue for 87 merchants indicated that annual web sales increased 32.9% to $46.53 billion in 2010 from $35 billion in 2009. In comparison, according to the National Retail Federation, total retail sales grew year over year about 3% to $2.4 trillion in 2010 from $2.33 trillion in 2009 (Internet Retailer, 2011).

Finally, it was reported earlier that the largest segment of Internet users reside in Asia. With respect to global e-business, China is by far the world’s largest online market. A September 2011 study of online

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* For an elaboration of each of these topics, as well as observed relationships between them, please see Niederman et al. (2012).
buyers conducted by PricewaterhouseCoopers determined that 86% of China’s nearly 200 million online shoppers consider themselves as experts in online shopping. This is compared to 72% of online shoppers in the United States and 70% in the United Kingdom. Chinese shoppers make 8.4 purchases online per month, compared to 5.2 purchases in the United States, or 2.4 in France and the Netherlands (Multilingual Search, 2012). There is no question that e-business is a growing global phenomenon, representing unique cultural requirements.

31.3 What Is Culture?

Culture has implications for Internet usage and affects e-commerce trust (Gefen and Heart, 2006; Jarvenpaa et al., 1999), B2C attitudes (Tan et al., 2007), website development (Junglas and Watson, 2004; Sun, 2001), information and communication technology adoption (Erumban and Jong, 2006), and Internet marketing (Tian and Emery, 2002). There are differences in online communication strategies for target markets between Japan, Spain, and the United States (Okayazaki and Rivas, 2002). Further, differences exist between cultures concerning website acceptance and preferences for design features (Evers and Day, 1997; Vyncke and Brengman, 2010). Specific to the IS field, there have been calls for research that integrates IS and national culture (Ford et al., 2003; Gefen and Heart, 2006). In the past several years, this call has been heeded by numerous researchers who have examined culture related to website characteristics. For a comprehensive listing of studies in which culture and e-commerce research are investigated, please see Vyncke and Brengman (2010).

Numerous definitions of culture exist, as do multiple levels of culture (Karahanna et al., 2005; McCoy et al., 2005). Within a given national culture, there are individual, team, or organizational differences—but it is expected there will be a dominant set of shared cultural values, attributes, beliefs, and behaviors (Erumban and Jong, 2006; Matsumoto, 1994). Culture is denoted as “a system of values and norms that are shared among a group of people and that when taken together constitute a design for living” (Doney et al., 1998, p. 67). While a single definition of culture is impossible, most frequently researchers have used nation state as a loose categorization for national culture (Doney et al., 1998).

For more than 30 years, researchers have relied on Hofstede’s (1980) work to make comparisons based on country affiliation. Hofstede’s dimensions of individualism–collectivism, power distance, uncertainty avoidance, or masculinity–femininity have been frequently used in previous research in IS, and more specifically in e-commerce (Vyncke and Brengman, 2010).* Although there have been questions regarding the validity of using Hofstede’s findings, results of his work are supported quantitatively and qualitatively by numerous studies in various disciplines (Sondergaard, 1990; Straub, 1994). Researchers often use Hofstede’s classifications to study social psychological phenomena (Dawar et al., 1996; Gefen and Heart, 2006; Yamagishi and Yamagishi, 1994), computer self-efficacy (Srite et al., 2008), and specifically cross-cultural differences in an e-business context (Cyr et al., 2009a; Jarvenpaa et al., 1999; Simon, 2001).

In addition to Hofstede, other cultural work related to website design relies on Hall’s (1976, 1990) two dimensions of culture for context and time (Smith et al., 2013 Vyncke and Brengman, 2010). Regarding context, Hall contends that meaning is formed based on how information is perceived, and that the form and function of information varies between cultures. Certain high context cultures like Japan rely on implicit information embedded in a context of social cues such as body language, eye movement, silence, or other nuances. Alternately, in low context cultures such as Canada, there is reliance on explicit forms of communication as found in text or speech. In addition, Hall categorizes cultures based on how members of that culture manage and perceive time. In monochronic cultures like Canada, time is seen as linear and in fixed segments that can be quantified and measured. Members of monochronic

* It expected most readers are familiar with Hofstede’s categorizations so they will not be elaborated here. However, for a thorough review and comprehensive discussion of cultural theories (including Hofstede’s work), as well as culture related to IT, the reader is referred to Corbitt et al. (2004).
societies tend to focus on a single task within a specified period of time and work on it until completion. In polychronic societies, time is viewed as continuous and unstructured, and the completion of the task is more important than the schedule of achieving it. Latin countries are examples of polychronic cultures when time is flexible.

In addition to an examination of users who differ by country, a useful but less utilized approach is to investigate differences and similarities between countries based on Clustering Theory (Hartigan, 1975). According to Clustering Theory, prediction occurs in two ways. First, if a group (country) is classified into a given cluster (country cluster), then information about behaviors or values of other members of that cluster would serve as predictors of expected behavior of the classified group. Second, measures (such as website design elements) that demonstrate a cultural affinity would be predictive of other members of another given group as long as they belong to the same cluster. For example, user perceptions of website design in Canada would be aligned to the United States since users are within the same cultural cluster. This approach is consistent with cultural researchers (i.e., Ronen and Shenkar, 1985) who adhere to a “culture cluster” model.

An alternate perspective concerning IT use does not focus on the impact of culture, but rather that IT and knowledge management systems may have a suppression effect (Mason, 2003). In this case, technology has a homogenizing effect on national preferences, including IT design and use. However, based on the majority of work related to website design in e-business, culture does matter (Cyr and Trevor-Smith, 2004; Smith et al., 2011). As an additional caveat, while research has mostly focused on culture and IT, an emerging and interesting avenue of consideration is how socio-cultural perspectives have a role to play in how users think about and utilize technology. More specifically, Cyr et al. (2009b) examined how socio-cultural values of masculinity and femininity were expressed not only across different cultural groups but also between men and women. The findings of this study will be elaborated in a later section of this chapter.

In sum, culture is pervasive and influences how users perceive ITs. Culture has an impact on the design and use of technology, and in this chapter, the spotlight is on website design. In the following sections, key elements of website design in an e-business context are elaborated, together with the impact of culture on the design–use relationship.

### 31.4 Culture and Website Design

Online consumers are attracted and engaged by effective website design (Agarwal and Venkatesh, 2002; Cyr, 2008a; Fogg and Tseng, 1999; Fogg et al., 2002; Hoffman et al., 1999; Nielsen, 2001). According to Gommans et al. (2001, p. 51), “A website has to be designed for a targeted customer segment … Local adaptation should be based on a complete understanding of a customer group’s culture.” The merging of culture and usability is known as “culturability”—when cultural elements in website design are expected to affect the way a user interacts with the site directly (Barber and Badre, 2001). When websites are culturally appropriate, or “localized,” then users are more likely to visit them, spend time on the site, and to revisit them in the future (Barber and Badre, 2001; Evers and Day, 1997). Localization is the process of adapting a product or service to a particular language, culture, and desired local “look and feel.” In localizing a product, in addition to language translation, details such as currency, color sensitivities, product or service names, images, gender roles, and geographic examples are considered.

Many corporations with international operations operate multiple country websites, and many of these websites are designed to exhibit localized characteristics. For example, in April 2012, Coca-Cola operated 157 websites for different countries. This is an increase of 32 websites from June 2009 (as reported in Vyncke and Brengman, 2010). Related to the earlier discussion of Internet usage and e-business, Coca-Cola segments its markets into six geographical regions with multiple websites in each: North America (4), Latin America (22), Europe (35), Eurasia (32), Africa (52), and Asia Pacific (12). Recall that some of the highest growth of Internet use was in Africa, with 2988% increase from 2000 to 2011.
It is interesting to note that Coca-Cola has 52 websites for Africa. In the North American market, two websites exist for the United States (English and Spanish) and two more for Canada (French and English). For the American sites, besides language, there are multiple other differences including use of color, design features such as animation, navigation, and type of information provided. These design differences, therefore, localize the website and make the site more appealing to local users.

Further, based on research investigations, different user preferences are found when design characteristics are considered across cultures (Cyr et al., 2009a; del Galdo and Nielsen, 1996; Marcus and Gould, 2000). In a study that systematically compared domestic and Chinese websites for 40 American-based companies, significant differences in cultural characteristics were found for all major categories tested (Singh et al., 2003). Cyr and Trevor-Smith (2004) examined design elements using 30 municipal websites in each of Germany, Japan, and the United States. Use of symbols and graphics, color preferences, site features (links, maps, search functions, and page layout), language, and content were examined, and significant differences were uncovered in each design category. In other research in which color (Cyr et al., 2010) or human images (Cyr et al., 2009a) were specifically investigated, cultural differences were likewise noted across culturally diverse groups.

Vyncke and Brengman (2010) aimed to determine if “culturally congruent” websites are more effective than websites when culture is not taken into account. A culturally congruent website is one that is localized (as defined earlier) and therefore matches the norms, values, and expectations of the user. Cultural congruency is measured on a variety of dimensions as identified by Singh and his colleagues (Singh and Baack, 2004; Singh and Boughton, 2005) based on the degree to which a website was localized. Websites range from standardized, when there is no customization across country locations, to highly localized. In the Vyncke and Brengman study, website effectiveness was determined based on whether or not users perceive a website to be useful, easy to use, entertaining, and facilitating positive attitudes and behaviors that result in users wanting to return to the website in the future. In total, 27 research studies published in 16 different journals are evaluated for cultural congruency related to effectiveness. This investigation provides strong empirical support for the positive impact of cultural congruency on performance measures.

### 31.5 A Suggested Taxonomy of Design Characteristics

Overall, design features have been broad and diffusely defined. However, in the realm of user experience design, Garrett (2003) suggests a number of viable design categorizations including information design, visual design, and navigation design. These categories encompass much of the research conducted in the website design area. They are used and experimentally validated by Cyr and her colleagues over several years from 2004 to 2012. It is expected that information design, visual design, and navigation design provide a useful framework for considering websites generally as well as culturally embedded websites in e-business. These categories are elaborated in the subsequent sections.

**Information design** refers to website elements that convey accurate or inaccurate information about products or services to a user. “Customers dissatisfied with web site information contents will leave the site without making a purchase” (McKinney et al., 2002, p. 308). Information is considered an important prerequisite to trust (Flavián et al., 2006; Yoon, 2002). Furthermore, there are differences in the type and amount of information that is considered appropriate across cultures. In North America, substantial amounts of product information are considered desirable, while in other cultures, the same level of information would be considered inappropriate as outlined in the subsequent sections (Cyr, 2002, p. 172).

On the [customer] support side, there’s a lot of pride in some European countries. In France they have a long history of what they’re doing, and status comes from the knowledge and expertise acquired. So it’s very important to only tell customers information about products which they assume it’s reasonable not to have … otherwise, it’s like trying to tell them how to do their job.
Research comparing user preferences for perceived access and presentation of product information in Canada, the United States, Germany, and Japan uncovered few significant differences between the United States, Canada, and Germany but significant differences \((p < 0.01)\) between these countries and highly collectivist Japan (Cyr et al., 2005). Based on qualitative comments from the study, there appears a desire on the part of Canadians, Americans, and Germans for utility—at least as far as obtaining site information is concerned. As one Canadian user elaborates:

For a first glance I like the first ten bullet points, the ten most important things. But if I’m looking for detail information I want it to be there. For example, the sizes and dimensions or something like that (Ibid, p. 41).

Elements of **Visual design** deal with balance, emotional appeal, aesthetics, and uniformity of the website overall graphical look. This includes colors, photographs, shapes, or font type (Garrett, 2003). Users from collectivist cultures such as China have a strong preference for visuals, whereas users from more individualistic cultures like Germany prefer a logical and structured page layout (Szymanski and Hise, 2000). As an example, in a study by Cyr et al. (2005), which includes Japanese participants and their perception of various website elements, these users noted they preferred pictures, bright colors, and animation. This sentiment is captured by a Japanese user who notes: “I say … use more pictures, more drawings to appeal to Japanese people … Japanese people like the emotional approach” (Ibid, p. XX). Alternately, an American respondent indicates: “… Banners drive me crazy, they are very distracting actually, when I got deeper into the site, there was a flashy thing over here, it is very distracting” (Ibid, p. 41). Color is a common differentiator by culture and connotes different meaning (Barber and Badre, 2001; Singh et al., 2003). Red means happiness in China but danger in the United States.

**Navigation design** refers to the navigational scheme used to help or hinder users as they access different sections of a website (DeWulf et al., 2006; Garrett, 2003). “No matter how thorough the information content of a site is, a customer who has difficulty in searching and getting the needed information is likely to leave the site” (McKinney et al., 2002, p. 308). User preferences for the form of navigational scheme are expected to vary by culture (Marcus and Gould, 2000). Germans who are moderately high on uncertainty avoidance “feel anxiety about uncertain or unknown matters” (Marcus and Gould, 2000, p. 39), and therefore prefer “navigation schemes intended to prevent users from becoming lost” (Ibid, p. 41). Simon (2001) found that individualistic Europeans and North Americans prefer navigation that enhances movement and makes the site simpler to use. Alternately, Asian/Latin and South Americans (generally collectivists) desire navigation aids to change the appearance of the site without particular concern for movement.

It is known that a website design effective in information design, visual design, and navigation design can support website trust (Cyr, 2008a,b). Further, the comparative degree to which these elements are important to users and engender trust varies across cultures, as further outlined in the subsequent sections.

### 31.6 Website Trust and Culture

Whether or not a website is trustworthy is an important consideration for potential online buyers. Unlike vendor–shopper relationships, as established in traditional retail settings, the primary communication interface between the user and the vendor is an IT artifact—the website. As such, trust is generally more difficult to establish. A lack of trust is one of the most frequently cited reasons for consumers not purchasing from Internet vendors (Grabner-Krauter and Kaluscha, 2003).

Corritore et al. (2001) provide a definition of online trust that includes cognitive and emotional elements. Hence, trust encompasses “an attitude of confident expectation in an online situation or risk that one’s vulnerabilities will not be exploited” (Ibid, p. 740). Website trust implies consumer confidence in a website and “willingness to rely on the seller and take actions in circumstances where such action makes the consumer vulnerable to the seller” (Jarvenpaa et al., 1999, p. 4). Establishing consumer trust in the
website is fundamental to online loyalty, which includes user intentions to revisit an online vendor or to buy from it in the future (Cyr, 2008b; Flavián et al., 2006; Gefen, 2000; Yoon, 2002).*

Trust is a highly researched topic in e-business. Antecedents to website trust vary and include website design characteristics (Cyr, 2008b; Cyr et al., 2009a; Ou and Sia, 2010). Other factors that engender trust are social presence (Cyr et al., 2007; Gefen et al., 2003; Hassanein et al., 2009); perceived vendor reputation (Jarvenpaa et al., 1999; Koufaris, 2002); clear and trustworthy privacy policies (Reichheld and Scheftel, 2000); online transaction security (Palmer et al., 2000); and information privacy (Hoffman and Novak, 1996), among others.

Cultural differences prevail related to user propensity to trust. For instance, individualists are more optimistic than collectivists concerning benevolence from strangers (Inglehart et al., 1998; Yamagishi and Yamagishi, 1994). Further, Kim and Son (1998) measured levels of distrust between highly individualist Americans and highly collectivist Koreans and find that 59% of Americans trust members of a different ethnic group in their society, and 57% trust people from a different country. For Koreans, the average responses are 23% and 18%, respectively. According to Yamagishi and Yamagishi (1994), exchange relationships outside a cultural group only occur when there are substantial institutional safeguards such as strong cultural norms or legal sanctions.

Prior research on website trust and culture compared Internet trust in collectivist and individualist cultures (Jarvenpaa et al., 1999). The researchers expect that consumers from individualist cultures would exhibit higher trust levels in an Internet store than consumers from collectivist cultures. Contrary to this hypothesis, no strong cultural effects are found for trust. Alternately, Simon (2001) finds that for information provided on American and European websites, Asians are most trusting (83% positive), while Europeans (46% positive) and North Americans (42% positive) exhibit substantially lower levels of trust toward the websites.

In related research, Cyr et al. (2005) conducts a study to investigate whether or not local websites engender higher levels of trust for web users than a foreign website of the same vendor (Samsung in this case). With reference to earlier work by Yamagishi and Yamagishi (1994) and others, it is expected that users from individualistic cultures such as Canada or the United States would be least likely to trust the local website, and most likely to trust the foreign website than moderately individualistic German users and collectivist Japanese users. When comparing the level of trust between countries for the local website, almost no differences are reported between the Canadians, Americans, and Germans. However, there are large differences between the Japanese with Americans, Canadians, or Germans. Contrary to expectations, Japanese respondents trust their local website least, while Germans trust their local site most. Similar results are found for users viewing the foreign version of the website.

Closely related to trust and information design is how legitimacy of the vendor, products, or services is conveyed to website visitors. According to Chen and Dhillon (2003), “Since transactions on the Internet occur without personal contact, consumers are generally concerned with legitimacy of the vendor and authenticity of products or services” (p. 1). In a study of website users in the United States, Canada, Germany, and Japan, all country groups score highly regarding the need to trust an Internet store with a well-known reputation, and regarding concern for the legitimacy of the online sales contact. As expected, Japanese are most concerned with online risk and security when buying on the Internet (Cyr, 2011). Canadians note they are aware of security problems when using the Internet, but feel the benefits outweigh the risks. As one Canadian describes,

You realize that some of the concerns the market has, or some of the perception that people have with security are unfounded ... The likelihood that someone is going to intercept the transmission between your computer and a website, and decipher it, is very low. (Ibid)

* A thorough review of trust in offline and online settings is not feasible within the scope of this chapter. However, the reader may wish to refer to Rousseau et al. (1998) for a critique of offline trust and Gefen et al. (2003) for a summary of online trust. Also of interest may be how trust differs from distrust in website design (Ou and Sia, 2010).
In research by Cyr (2008a,b), information design, visual design, and navigation design are modeled to determine if a statistical relationship exists between these design elements and trust. A total of 571 participants located in Canada, Germany, or China completed an experimental task and online survey ($N = 230$ in Canada; $118$ in Germany; and $223$ in China). Results of the investigation indicate that navigation design results in trust for Canada and China, visual design results in trust for China only, and information design results in trust for Canada only. It is clear there are distinct design proclivities between the countries in this study. Also of interest is that the three design characteristics explain trust better in Canada and China than in Germany. In the case of Germany, it appears that other characteristics not captured in this study also contribute to online trust. This may include the company name and reputation, or perceived security of information.

Hence, while it was already established that affinity to trust varies between cultures, studies that focus on website design characteristics indicate that design elements have the capability to elicit user trust—and that differing design elements are more important in certain cultures than in others.

### 31.7 Emotion, Website Design, and Culture

Online shopping is recognized to encompass both utilitarian and hedonic components (Childers et al., 2001; Kim et al., 2007; Lim and Cyr, 2009, 2010; Sun and Zhang, 2006; Tractinsky, 2004). Utilitarian-focused shopping is aimed to achieve predetermined and cognitively oriented goals. In terms of website design, effective information design or navigation design assists the online shopper to achieve such goals. On both a theoretical and a practical level, utilitarian outcomes of online shopping are expected to result in perceived usefulness or effectiveness as extensively investigated in IS using the technology acceptance model (TAM) (Davis, 1989).

Alternately, much less researched are hedonic website elements used to create an experience for the online consumer which is positive, enjoyable, and that provides emotive and sensory pleasure (Bruner and Kumar, 2003; Cyr et al., 2006; Kim et al., 2007; van der Heijden, 2003). Recently, researchers examine how vividness (i.e., the richness and in media and information presented to users) influences user emotional responses in e-commerce (Sheng and Jiginapelly, 2012). In other work, website “socialness” leads to enjoyment and influenced user intentions to use online products (Wakefield et al., 2011). Finally, the effective use of images or colors on a website can contribute to emotional appeal for users (Garrett, 2003; Rosen and Purinton, 2004).

Further, in the context of hedonic consumer interactions, researchers investigate perceived social presence as an important antecedent to online consumer enjoyment (Cyr et al., 2007; Hassanein and Head, 2007). Social presence implies a psychological connection with the user who perceives the website as “warm,” personal, sociable, thus creating a feeling of human contact (Yoo and Alavi, 2001). Hassanein and Head (2007) demonstrate that emotive text and pictures of humans result in higher levels of perceived social presence for websites. As such, social presence straddles the areas of information design and visual design. In addition to social presence resulting in online enjoyment, it has implications for website trust (Cyr et al., 2007; Gefen and Straub, 2003; Hassanein and Head, 2007), website involvement (Kumar and Benbasat, 2002; Witmer et al., 2005), and utilitarian outcomes such as perceived usefulness or effectiveness (Hassanein and Head, 2004, 2006, 2007).

While the foray to investigate hedonic elements of website design is relatively less studied than utilitarian design elements, the amount of research that examines these topics from a cultural perspective is more scarce. Only a few studies have been conducted in which hedonic website design features are systematically modeled across diverse cultures. More recently, research in this area is beginning to emerge. For instance, Tsai et al. (2008) examine emotion and visual information uncertainty for websites using a Taiwanese sample with differing levels of uncertainty avoidance (one of Hofstede’s cultural dimensions). Using a three country sample (Canada, Germany, and China), Cyr (2008) discovered that visual design resulted in satisfaction for users in all three countries and trust in China only.
Hassanein et al. (2009) aimed to determine if perceived social presence is culture specific or universal in online shopping settings. These researchers find that for Chinese and Canadian users' social presence led to similar levels of usefulness and enjoyment, but trust only for Canadians. Cyr and her colleagues conducted two separate research investigations with Canadian, German, and Japanese users regarding their reaction to visual design website elements. In one study, survey data indicate that human images universally result in image appeal and perceived social presence; while interviews and eye-tracking data suggested participants from different cultures experience the design images differently (Cyr et al., 2009a). In the second study, website color appeal is found to be a significant determinant of website trust and satisfaction, with differences across cultures (Cyr et al., 2010). Collectively, these research findings highlight unique perceptions and outcomes of users in different countries based on different cultural orientations.

The widely used TAM, which represents utilitarian outcomes for usefulness, ease of use, and behavioral intention (to use the technology) has also received attention in a cultural context (i.e., McCoy et al., 2005; Rose and Straub, 1998; Straub et al., 1997). Although not specific to design elements in an e-business setting, a landmark study by McCoy et al. (2005) examines the viability of TAM with almost 4000 students representing 25 countries. Results of the investigation reveal that TAM is not universal, and in particular does not apply for individuals who are low on uncertainty avoidance, high on power distance, high on masculinity, and high on collectivism.

Further, in a cross-cultural examination of online shopping behavior in Norway, Germany, and the United States (Smith et al., 2013), patterns for cognitive (i.e., utilitarian) and affective (i.e., hedonic) involvement with a website are examined using a TAM framework across the cultures. The key finding is that the TAM model does not apply for Norway and Germany, although it does for the United States where it was developed. Additional findings reveal that as expected, cognitive involvement is an antecedent to perceived usefulness and perceived ease of use in all three countries. However, for affective involvement, there is a relationship to behavioral intention for the U.S. and Norwegian samples, but not for Germans.

In one additional study, Cyr et al. (2009b) uses TAM to examine gender and socio-cultural differences in samples located in Canada and the Netherlands. Canada scores highly on Hofstede’s masculinity dimension (i.e., a focus on material success and achievement), while the Netherlands scores very high on the femininity dimension (i.e., a focus on relationships and cooperation). In the study, website design elements are used to create online social presence, which was then modeled to perceived usefulness and behavioral intention (operationalized as e-loyalty). Of particular interest is whether masculinity and femininity impact social presence, perceived ease of use, and trust. Masculinity was further hypothesized to influence perceived usefulness. The results show that while biological sex affects only perceived ease of use, the effects of femininity extend also to trust, and those of masculinity also to trust and social presence. Therefore, masculinity and femininity are relevant predictors in the research model and suggest a need to reexamine the relationship between IS constructs, on the one hand, and biological sex and masculinity or femininity, on the other. Of interest, nationality has a direct effect on masculinity, while femininity is influenced by an interaction of nationality and biological sex. This study further emphasizes the subtle relationships that exist concerning IS design and use across cultures.

### 31.8 Additional Applications for IS Design and Use

This chapter has been focused on the interplay of culture and IS with a focus on e-business. However, as indicated in the Introduction, there are numerous other related areas in which the lessons learned regarding e-business are also applicable. More specifically, e-business is a technology supported by design characteristics in the realm of information design, visual design, and navigation design. These design elements are likewise relevant for e-government, virtual teams, online corporate training programs, management of IS, or e-health, among other areas.
As one example, for e-government, the same technologies that assist to build trust and loyalty among users are useful as in e-business. Dynamic websites are required that are culturally appropriate, and which engage the user. The main difference for e-government websites is the expectations of the users who view information in the public domain, and who have differing requirements from e-business users. In one study in which trust is evaluated in the e-government tax system of Singapore (Lim et al., 2012), one respondent indicates:

There is excellent service at the e-file helpline. Also, there are user-friendly fields with help buttons. The entire set up in e-filing is meant to be easy for taxpayers. The system has user-friendly navigation, simple interface, easy for anyone to get tax filing done without adding more grief to the already undesirable task. (Taxpayer)

When design elements meet user expectations and facilitate the completion of online tasks, then trust results. Although the study by Lim et al. does not examine cultural elements, the appropriate use of symbols, colors, etc. for the e-government website in the Singaporean context will contribute to user satisfaction and loyalty. The same can be said for the other topics mentioned above. Further elaboration beyond e-business of design use and applications appears in the sections on practice in the subsequent text.

### 31.9 Impact on Practice

Website localization carries a substantial cost to companies, particularly those companies which operate in multiple locations (e.g., in 2012 Coca-Cola operated in 157 countries). However, based on much of the research presented in this chapter, effective localization of web content and design features to specific country users is necessary and has the potential to further engender user trust. Despite this finding, many international companies fail to localize their websites.

While in an ideal world, companies will localize their websites for each country or cultural group, it is known that certain countries cluster together regarding user perceptions of website design. For example, users within North American or Latin American clusters are very similar (Cyr, 2013). Adaptation of website design in these clusters may only require minimal modifications. Further, in Canada while language localization (French and English) is essential, other forms of website adaptation are less necessary. It is noteworthy that “cluster localization” serves the purpose of providing some degree of cultural adaptation to user groups, but with a substantial cost savings to online vendors over deep localization procedures.

The importance of creating websites in the local language of the user is obvious, and perceived usability is increased when a website is originally conceived in the native language of the users. Even though translation may be of an excellent quality, there is still a level of cultural distance, which impacts a user’s evaluation of a website (Nantel and Glaser, 2008). Hence quality of the language is important, along with culturally embedded metaphors of the target group. Subsequently, managers for e-business sites will ideally test the usability of their sites for various international locations with respect to language and redesign them as necessary.

In terms of information design, information quality should be high, with online product information complete, detailed, and trustworthy. Information design is especially important to some users (e.g., Canadians), and it is statistically related to trust. This is a beacon to online vendors to pay special attention to effective presentation of information on the website. Type and amount of information varies by country and should also be tailored to particular users. For example, the majority of users note they prefer few product details when first entering a website, and these details should be easily accessible. Detailed information can be embedded at the next level of the website (Cyr et al., 2005). Generally speaking, users in lower context cultural locations especially desire clarity of information and larger amounts of it.
Visual design preferences likewise vary by culture. For instance, Cyr (2008) find visual design to be especially important to Chinese users. Among this group, high-quality visual design, in turn, resulted in website trust. This was not the case for Canadians and Germans who were included in the same investigation. As such, website designers should pay particular attention to the colors, images, shapes, and overall graphical look of websites for high context, collectivist users who prefer a more “emotional approach.” More specifically, brighter colors such as red are preferred, along with animation.

Still in the realm of visual design, based on survey data, users universally prefer websites with images including facial features over human images without facial features, or no human images. Human images result in image appeal and perceived social presence, eventually resulting in website trust (Cyr et al., 2009a). In this same study, interview data reveals different categorizations as to how images are perceived. This includes (1) aesthetics—pleasantness of attractiveness of the website; (2) symbolism—the implied meaning of design elements (i.e., that an image of a man and a little girl are a representation of father and daughter); (3) affective property—emotion eliciting qualities; and (4) functional property—website structure as organized or distracting. Of interest, perceptions of images vary by culture between Canada, Germany, and Japan. For example, in the condition when images include facial features, for Canada these are perceived as aesthetic and affective; for Germany as function, affective, and symbolic; and for Japan as aesthetic and affective. While images are expected to be perceived differently across cultures, this work suggests a fine-grained analysis of differences and that images must be carefully chosen to be localized to user preferences. An additional finding from the work by Cyr and her colleagues is that partial human images (i.e., a torso only) generally appear unnatural and unexpected to users and therefore should be avoided.

Color appeal has the potential for emotional impact leading to website trust and satisfaction, and subsequently to online loyalty (Cyr et al., 2010). In this investigation, Canadians have a stronger preference for a grey color scheme for an electronics e-business website compared to Japanese and Germans. Germans prefer a blue color scheme for the same website. Similar to the subtleties that occur when using variations of images for website design, when examining colors across cultures user preferences emerged from interview data. For example, the color blue is universally one of the most popular and trusted colors. The cultural differences are still quite significant: for Canadians, this color elicits a wide range of attributes including being perceived as aesthetic, affective, functional, harmonious, and appropriate. For Germans, blue is perceived as functional, affective, and appropriate. For Japanese, it is affective and functional. In sum, from a practical perspective, website designers need to pay attention to color for specific cultural groups—which in turn results in loyalty wherein users revisit the website in the future.

The third design element that is discussed in this chapter is navigation design. While elements of navigation vary, consistency of page layout and quick access to navigational features are universally desirable. Navigation design is highly related to trust in some countries (e.g., for Canadians and Chinese), which suggests that users from these countries expect websites that are clear and transparent (Cyr, 2008a). Navigation itself has cultural nuances. For instance, Canadians expect utilitarian websites that enhance movement and are easy to use. Generally speaking, cultures high in uncertainty avoidance will prefer clear and detailed platforms for how to navigate a website.

Expanding beyond e-business, it would make sense that information design, visual design, and navigation design be tailored to other areas of website design in various cultural contexts. This may include websites used by virtual teams, e-learning-training sites as used for constituents from diverse cultures, or for cross subsidiary IT management committees. For instance, trust is important for virtual team performance (Edwards and Sridhar, 2005) and for distributed teams (Dinev et al., 2006). Based on the material in this chapter, it is proposed that such trust can be developed through effectively designed and localized websites.

As website design becomes more sophisticated, and with emphasis on hedonic elements and how to develop warm and sociable websites, design features for enhancement of social presence in website design become increasingly of interest. As already noted, social presence relies primarily on human images and emotive text—and as such includes elements of both visual design and information design.
Since social presence typically results in enjoyment, trust (Cyr et al., 2007; Hassanein and Head, 2007), involvement (Kumar and Benbasat, 2002; Witmer et al., 2005), perceived usefulness, and effectiveness (Hassanein and Head, 2004, 2006, 2007), then website designers will do well to incorporate images and emotive text as an important element of design—both within and across cultures. However, usability testing will need to be conducted to determine exactly the best method for how this will occur.

The addition of social presence elements is receiving attention in e-health and shows promise to ensure that users remain on health websites or revisit them in the future. Crutzen et al. (2012) experimentally test the addition of social presence elements on a hepatitis website. While social presence elements are of interest to users, there is no significant difference between website viewing when social presence elements are present versus absent. It appears that for e-health websites, information design is paramount, and that users first require trustworthy information; visual design elements are secondary. However, as the authors point out, personalization is an important strategy for e-health websites. As such, communication is individualized for a user, with the expectation that this will result in a more positive experience (Hawkins et al., 2008). In a similar way, social presence elements on e-health websites may require tailoring or personalization—a technique which is commonly used and found to be effective for the dissemination of information on intervention websites (Krebs et al., 2010). Across cultures, differences are likewise found related to masculine and feminine value orientations in website design, and these differences deserve attention. For instance, in higher masculinity cultures, interface design elements are focused on traditional gender/family/age distinctions; work tasks, roles, and mastery; navigation oriented to exploration and control; attention gained through games and competitions; and graphics, sound, and animation used for utilitarian purposes. Feminine cultures emphasize blurring of gender roles; mutual cooperation, exchange, and support rather than mastery and winning; and attention gained through poetry, visual aesthetics, and appeals to unifying values (Zahedi et al., 2006).

Applying the masculinity–femininity concept to international users, multinational companies that market to a variety of countries might do well to align the values of the designers to the users for whom they are designing. That is, rather than have a team of North American web designers localize websites for all country constituents, designers with values of either masculinity or femininity may be matched to the overarching cultural values present within a country. For North America, more masculine-oriented designers would be appropriate, while in feminine cultures such as the Netherlands, designers with feminine-oriented value systems would be employed.

In sum, there are numerous ways in which websites can be adapted to accommodate the preferences of users in different cultures or country locations. Based on the preceding, in addition to more obvious modifications such as language translation, there are numerous subtleties that exist related to information design, visual design, and navigation design, among other design features. While there is a cost attached for companies who localize websites, I propose that this is a necessary component of doing international online business if online shoppers are to trust the website and be loyal to the vendor in the future. In addition, the same lessons for website design in e-business find application in other areas of IS use and design such as e-government, e-health, virtual teams, or other settings.

### 31.10 Research Issues

While there have been several rigorous studies in which the impact of website design as an IT medium has been examined in e-business across cultures, there is considerable scope for future research in alignment with practical considerations as outlined in the previous section.

One such research area is to move beyond cultural groups as the defining characteristic for the study of website localization. Although there is merit in using Hofstede (1980) or other cultural theorists to determine broad cultural categorizations, an alternative point of view is to utilize a wider variety of country characteristics as they impact user perceived value of websites for e-business. For instance, in a huge study involving 8886 consumers from 23 countries and 30 websites, Steenkamp and Geyskens (2006) considered country characteristics such as “rule of law” and the regulatory system, national
identity, and individualism as influencing users’ perceived value in website design. They found that the effects of privacy/security protection (which would be related to trust) on perceived value is stronger for users in countries with weak regulatory systems. Further, users in countries high on national identity find it of particular importance that there is cultural congruity between themselves and the website—and therefore that website localization occurs. It would be of interest to investigate this further as it applies in e-government. Finally, users from more individualistic countries find pleasure or hedonic outcomes to be essential, along with privacy/security protection, and customization of website design compared to users in collectivist countries.

In this vein, in addition to Hofstede’s dimension of uncertainty avoidance, Cyr (2013) uses clustering theory (i.e., wherein countries with similar values and beliefs are clustered together) to determine preferences for website design across cultures.* As already noted, this resulted in some remarkable similarities between certain country groupings such as for North America or Latin America. In this same investigation, country indicators such as Internet connectivity and infrastructure, the digital and legal environment, and consumer and business electronic adoption were used to discuss user reactions to an e-business website. In future research, it is suggested that such additional parameters be used more frequently related to website design and use. Such clustering might be used for the adoption and diffusion of various IS technologies such as adoption of large-scale applications (e.g., ERP systems and Intranet facilities) or in more specific adaptations of training procedures or software development for certain cultural groups. In each case, cultural localization can occur, but for similar cultural clusters rather than on a country specific basis.

The collection of individual-level data is an additional alternative to the use of established cultural categorizations for the study of IT use, and website design more particularly. Collection of individually based or “espoused” user data has been advocated by scholars (i.e., McCoy et al., 2005; Srite and Karahanna, 2006), and has significant advantages to determine culturally specific user values. For example, in Canada there are not only significant value differences for French- or English-speaking users but also for numerous other cultural groups. To elaborate, in Vancouver on the West coast of Canada, there is a predominant Chinese community—and even within this “cultural” group, it is expected there are widely varying cultural values related to whether a user is Chinese born in China or indigenous Chinese born in Canada. Collecting data in this way leads researchers into the area of learning more about socio-cultural value systems, in which more specific values are accessed compared to those represented in established global cultural groupings. As research into cultural values and IT use matures, such fine grained comparisons will be useful—if not imperative. The results of such investigations will be useful for better understanding IS employee values and attitudes, and how IS managers can best facilitate successful implementations and strategies based on cultural proclivities. As one example, it is known that in different countries, MIS project managers perceive projects and risks differently (Choi and Choi, 2003; Peterson and Kim, 2003). Additional research on risk based on socio-cultural values will potentially provide more focused and relevant information than relying on country-based cultural groupings.

Research on the topic of IS design and use, including website design in e-business has typically relied on surveys with single or multiple item scales. However, as measurement techniques expand, there is opportunity to delve into new methods that more deeply and comprehensively attend to what users are experiencing. More specifically, neurophysiological techniques such as functional magnetic resonance imaging (fMRI) have been used for testing reactions to product packaging (Reimann et al., 2010), and there is merit to pursue these alternative methodologies as they inform website design communities. To this end, human images in website design (Cyr et al., 2009a) as well as user reactions to different colors on websites (Cyr et al., 2010) have been measured using eye-tracking equipment to determine exactly where and for how long users look at elements of design. Coupled with interviews to determine why users look where they do, these methods offer a systematic analysis of website elements.

* The results of the GLOBE project appear in a series of papers in the Journal of World Business by House et al. (2002).
Most recently, a paper published in the top IS journal, *MIS Quarterly*, by Dimoka et al. (2012) charts a research agenda for the use of neurophysiological tools in IS research. The use of methodologies such as eye-tracking and fMRI are part of an evolving research agenda and are well applicable to study IS design and the cognitive and affective outcomes for users related to their reactions to website design principles. In this regard, Djamalabi (2011) examine online viewing and aesthetic preferences using an eye-tracking device, while Sheng and Jiganapelly (2012) explore website atmospherics. These methodologies offer precise insights into why users respond as they do—which in turn serves to develop or elaborate design theory.

With respect to the topics as outlined in this chapter, the realm of emotion and hedonic responses by users to various design features is generally under-researched and thus presents opportunities for additional study. As previously indicated, one particular area of future research concerns the application of personalization through social presence elements in e-health. Further study could also be devoted to social presence in website design across cultures, where to date these appears to be only a very few investigations on this topic (i.e., Cyr et al., 2009b; Hassanein et al., 2009). Finally, the impact of design aesthetics in mobile commerce is a contemporary topic worthy of future investigations. Visual design aesthetics significantly impact perceived usefulness, ease of use, and enjoyment of mobile services (Cyr et al., 2006), although how mobile designs are perceived by diverse cultural users is mostly unknown. With the high usage of mobile devices, it would be interesting to know how cultural users perceive various design characteristics—on both utilitarian and hedonic dimensions.

### 31.11 Summary

The impact of culture on IS design and use is pervasive and very broad in scope. In this chapter, emphasis has been on website design features in e-business, and in particular information design, visual design, and navigation design. These all have potential to influence user trust toward a website, and all have a varied impact related to culture of the user. From a practical perspective, the impact of website localization (and the attainment of cultural congruity) has the potential to turn web browsers into online purchasers, and the implications for vendor profits are substantial as a result. According to Reichheld and Schefter (2000), an increase in customer retention rates by only 5% can increase profits by 25%–95%. Therefore, the development of loyal customer behavior is a valued goal for managers, marketers, and strategists. Further, from a research perspective, there are numerous topics that merit investigation, and there are novel and interesting methodologies that enable investigators to gain new and deeper insights into how cultural variables impact IS design and use.

### Keywords

National culture, information systems design, e-business, website design, localization, information design, visual design, navigation design, and website trust.

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Impact of Culture on Information Systems Design and Use


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