

# Cultural Barriers of Human–Computer Interaction

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## INTRODUCTION

Information and Communication Technology (ICT) researchers and practitioners are well aware of the cultural challenges brought on by a global market (Smith, 2004; Smith, Dunckley, French, Minocha, & Chang, 2004). However, there are many unresolved problems concerning the extent to which culture influences ICT usability. Businesses use ICT in the form of databases to house customer information, Web sites enabling customers to place orders, information systems for management or suppliers, training systems, and as products sold to customers. Internet growth enables businesses to expand their customer base to international markets. Thus, businesses benefit from the explosion of Internet usage but may be challenged by how to best meet the needs of their multi-cultural customers, suppliers, and employees. There is a need to develop a model of cultural barriers to human-computer interaction (HCI). With all of the technology in use today, along with the different cultures that interact with ICT, it is important to identify a model of ICT and the HCI barriers produced by it to better help designers of ICT avoid these technology pitfalls. Figure 1 displays how the incorporation of technology, people, and culture into businesses must be carefully positioned together to optimize the success of all involved.

This article examines cultural barriers to HCI and outlines a model to help designers of ICT avoid these barriers so as to enhance a company's ability to conduct

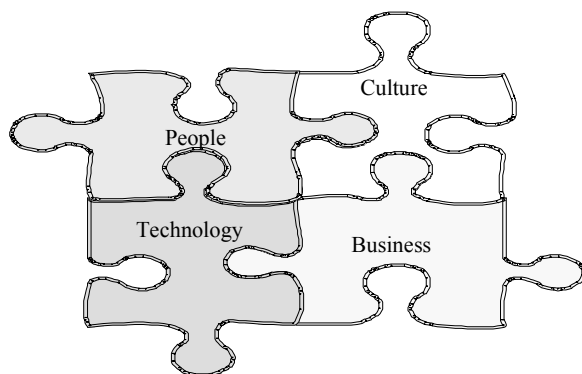
business internally and with international businesses and customers. The article addresses topics of interest to ICT practitioners and researchers alike. Current services available to businesses that support effective international HCI are discussed. Current research and future research opportunities in the field of international HCI in ICT are also examined.

## BACKGROUND

It is important to define HCI as the study of human behavior in interacting with any computer-based device such as a Web page, information system, or other technology. Through the study of HCI, researchers optimize interactions between the human and technology through better design of the ICT. Traditional ways of conducting business seldom exist in a society experiencing growth in the Internet, globalization of trade, and digital integration internal and external to a company. The role of ICT including e-commerce and information systems has become more complex as businesses continue expansions into global markets (Laudon & Laudon, 2004). With businesses having multi-cultural customers, suppliers, and employers, there are demands for businesses to utilize ICT that adequately meets the needs of cultural groups that interact with the technology. This section discusses how international HCI is an important aspect of ICT. In fact, there are businesses that specialize only in servicing other businesses in providing multi-cultural aspects to ICT. Furthermore, current research in the field of HCI is addressed to uncover cultural barriers to HCI that potentially produce ineffective ICT for specific user communities.

Today, HCI is in the spotlight as companies outsource software development or Web sites, operate e-commerce businesses, and extend their services to international customers. The globalization of business has pushed industry into finding ways to incorporate international HCI. Usability is a topic under the umbrella of HCI that is important to design into any ICT, especially systems utilized by a multitude of international users. Zwick and Dholakia (2004) suggest that adoption of any ICT brings about multiple issues to consider regarding social, politi-

*Figure 1. Core components for international businesses*



cal, economic, and cultural implications. ICT such as Web sites are generally adopted to solve a business need, but this article also suggests that with the introduction of technology, businesses may inherit new challenges before achieving full resolution of their business need. With the globalization of businesses, cultural barriers must be identified and corrected in ICT-enabling companies to continue relationships with different cultural groups within their customers, employees, and suppliers.

There are ICT practitioners dedicated to servicing businesses to support effective international HCI. Current services available to support multi-cultural HCI business needs consist of companies that provide written translations, verbal interpretations, multilingual desktop publishing, audiovisuals, Web site localization, globalization consulting, language services, global branding support, content development, end-user experience designs, translation of business correspondence, international user research, usability testing, etc. Aplomb Translations (2004) is an example of a company that specializes in providing multi-cultural language services. Aplomb focuses on audio and video transcription, subtitling, voice-overs, and Web site translation. Another company, ABC Translations (2004), focuses on services such as Web site and software localization. Web site localization assists a company with services such as providing multilingual online marketing strategies to globalization-friendly sites. Software localization uses in-country specialists to create localized versions of software applications to serve specific cultural user communities. Crosscultural (2004) provides global online marketing, helping companies expand their Internet presence into different cultural communities. The expansion into global markets creates open doors for practitioners and researchers providing services and solutions that help businesses to better meet the demands of multi-cultural customers, suppliers, and employees through effective international HCI in ICT.

Research has been performed in the field of HCI and the subtopic of international HCI has increasing popularity with the globalization of business. Cultural barriers to verbal communication between individuals from even different English-speaking countries can be difficult (Norman, 1999). Barriers to international HCI are therefore concerned with not only language but also other factors as well. Heldal, Sjøvold, and Heldal (2004) suggest that a user's perception of a Web site will vary from culture to culture and is influenced by every aspect of a site, even beyond content and language. This experiment focused on evaluating Web sites using subjects from Norway and South-Europe. Aspects of a site such as site organization, frustration and innovation were rated differently by the Norwegian participants than the South-European partici-

pants. These findings suggest that differences in perceptions or impressions of a site can be related more to culture than the actual design of a site. An experiment conducted by Siala, O'Keefe, and Hone (2004) indicates that individual religious backgrounds may also affect online trust towards electronic commerce. They found that people and communities of people sharing common values and personality traits from different cultural groups can build in-group trust (Siala et al., 2004). The study compared individual responses based on their religious affiliation (Christian, Muslim, etc.), gender, and ethnicity. The study measured the extent to which religion and possibly in-group trust affects a participant's buying habits and inclinations to buy online from within a religious group. Findings indicate that religious backgrounds did make a difference as some participants appeared to be more consumer religio-centric. Trust and attitude in a Web-based retailer varies within cultural groups and increases the importance of businesses identifying with different cultural groups where trust and attitude affect buyer behavior (Siala et al., 2004). Another study by Cannon and Perrault (1999) suggests that satisfaction is important in relationship marketing, which is also linked to communicating proper and distinctive impressions. There are also interrelated aspects of these cultural barriers, as Heldal et al. (2004) suggest that poor usability of a site may give a customer a bad impression of the company and its products. These studies serve to demonstrate that international HCI is important in the design of effective ICT.

The term "usability" refers the capacity of software to easily and quickly perform the tasks that users seek (Dumas & Redish, 1999). Nielson (1993) further classifies usability as either practical or social acceptability. For the purposes of this article practical acceptability examines the usefulness of the ICT being able to carry out needed user functions. For example, if a person from England uses the search feature on an American Web site to find the term "organisation," the site should accommodate the language of the user even if it is not in the language of the designer of the site (i.e., Americans spell the term using a "z" instead of a "s" as in "organization"). Social acceptability refers to whether the technology is considered ethical within the purpose of the technology. This area is obviously complex and important since different cultures may have different impressions of ethics. Companies obviously should be interested in the effect of how pleasant a customer's online shopping experience is on sales. Furthermore, it is important that employees have very usable ICT systems because employees using difficult systems may spend longer performing set tasks and this could also impact morale and subsequently productivity.

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