Cross-Cultural Technology Design

Creating Culture-Sensitive Technology for Local Users

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Preface

It is striking for American adults to realize that the same mobile text messaging technology used in the States primarily by teenagers for social grooming and fun chat is also used by a Chinese bride-to-be to send wedding invitations to friends of her age, by a migrant Filipino nanny to "mother" her children half a world away with dozens of daily text messages, by an amateur Japanese writer to compose and publish *keitai* (cell phone) novels followed by thousands of readers online, by a Malaysian Islamic court as a legitimate announcement of divorce, and by doctors in South Africa to monitor and prescribe medications to HIV/AIDS patients.

It is also hard to find another technology like mobile text messaging that has engendered such diverse uses across the globe, been portrayed by so many faces in different locales, and formed such myriad articulations and identities. Unlike email, pagers, instant messaging, and blogging, which seem to have similar uses across cultures, mobile text messaging technology can be defined dramatically differently in diverse cultural contexts in terms of public vs. private, formal vs. casual, orality vs. literacy, and social vs. technical.

The phenomenon of mobile text messaging use represents one of many demanding challenges that cross-cultural technology design has faced in this increasingly globalized world with a rising participatory

culture. Nowadays, cross-cultural design has become a standard prac-
tice and a daily test in many Information Technology (IT) companies
as follows.

First, a large number of today's IT products are consumer-oriented.
Compared to the applications and technologies used to manage com-
puting tasks and coordinate business processes for large organizations
(e.g., enterprise information systems), these products are expected to fit
into the fabric of an individual user's everyday life. While the local uses
of IT enterprise products might share similarities in work flows and
organizational structures across cultures, the local uses of IT consumer
products take on numerous cultural and social meanings in different
cultural contexts.

Second, individual users are the heroes of this era of participatory
culture, as profiled as "the person of the year" by *Time* magazine in
2006. They are not passive users but active designers who shape, rede-
sign, and localize an available technology to fit into their local contexts.
The dynamic user efforts of incorporating a technology into one's life
are called *user localization* in this book, which differs from *developer
localization*—the localization work that occurs at the developer's site
to which we commonly refer. These endeavors of *user localization* con-
tinue from *developer localization* and often determine the market success
or failure of an IT product. The practice of ending the development
and production cycle at the moment of shipping is forever gone.

Third, while localizing an IT product to different local cultures
is already difficult, the fact that a user would use a technology accord-
ing to his or her lifestyle raises intriguing questions for cross-cultural
design: How can a technology be designed as both usable and mean-
ingful to culturally diverse users? How can a technology both reach
diverse cultural groups and touch individual users? How can we strike
a balance between local cultural ethos and individual subjectivity in
a design? How could such a design appeal to a local context without
stereotyping the local culture in an essentialist fashion?

All of these challenges urge researchers and practitioners to
develop an effective approach to design appropriately localized prod-
ucts that meet the cultural expectations of local users, support their
complex activities in concrete contexts, empower their agency, and
mediate their identities. In this book, I present the design philosophy

and model of Culturally Localized User Experience (CLUE), which integrates action and meaning through the cyclical design process in order to make a technology both usable and meaningful to local users, as an attempt to address the challenges and answer the questions above. Regarding local culture as the dynamic nexus of contextual interactions, the CLUE approach incorporates key concepts and methods from activity theory, British cultural studies, and genre theory, and argues that a technology created for a Culturally Localized User Experience mediates not only instrumental practices but social meanings as well. This approach places concrete use activities on center stage, which is often missing in current cross-cultural design literature and practice.

To illustrate, enrich, and fully develop the CLUE approach, I present a comparative study of mobile text messaging use in American and Chinese contexts, which investigates a technology that is poorly localized at the developer's site but is then rescued by users' localization efforts. The study was conducted at an interesting moment, when text messaging reached a point of being widely adopted by a larger population of users in many places of the world, and when the technology became a seamless part of the lives of many users, who used it in different ways according to their lifestyles. Forty-one frequent users from the U.S. and China participated in the study, five of whom are profiled as individual cases of user localization in this book.

The global traffic of mobile messaging is expected to reach 8.7 trillion messages in 2015, rising from 5 trillion in 2010 (Informa Telecoms & Media, 2011). After text messaging has been part of many people's lives, it is illuminating to study concrete use activities at sites of technology-in-use and listen to individual voices of local users behind the numbers and patterns, trend charts, and interview quotes that are commonly found in mobile messaging research, not to mention the similarities in modes of use between then and now (see Chapter 4). This book is an effort to fill that gap, offering ways for researchers and practitioners to think about how to reach culturally diverse users in this *glocalization* age and help local users to consummate Culturally Localized User Experiences of an emerging technology like mobile messaging. At the same time, these vivid user stories demonstrate how an emerging technology was adopted, used, consumed, and localized in a global context; how an object of instrumentality traversed through social circulation,

obtaining and altering meanings, sustaining and eradicating practices, and constituting and destabilizing the structure; and how user needs arose, were cultivated, evolved, and/or disappeared.

By examining and comparing the *user localization* of mobile text messaging in two distinctly different cultural contexts, I search for ways to improve the *developer localization* and advocate a cyclical, open-ended design process that connects design and use, starting the dialogue between designers and users and helping the cross-cultural design community to better meet the demanding challenges of satisfying local cultural expectations in this participatory culture.

Cultural diversity in this book refers to the fact that we live in a multicultural global society; a variety of local users for a global technology form *culturally diverse* users. This applies to design situations of localizing a technology for assorted local cultures and those of designing a technology for collaborative use between users from different cultures at the same time.

Intended Audience

I am writing this scholarly book for people who work in the fields of human–computer interaction (HCI), technical and professional communication, user experience design, translation and localization, cross-cultural communication, information design, information studies, information systems, social computing, computer supported collaborative work (CSCW), writing and literacy studies, industrial design, science and technology studies, mobile communication, and Internet studies, to name a few; for people who share a passion for and an interest in making technologies that serve the needs of and give meaning to the lives of culturally diverse users; and for people who believe that designing a more culturally sensitive technology creates a better future for this global village. In the book I generally refer to this cohort of people as the cross-cultural design community.

For readers with a primary interest in cross-cultural issues, I would like to highlight the pervasive technological impact and illustrate the dynamic articulations of technology and culture in our contemporary situation. For readers with a background in technology design, I would like to emphasize technology design as a cultural practice rooted in the

local and show its complicacy. For critical communication scholars and technologists, I would like to stress the emancipating power of design as the primary activity of human beings, which, deeply interwoven with the technology use decisions we make daily, will help us build a better technological order and design a better life and future in this technological culture.

While the book is mainly targeted at an academic audience, I hope thoughtful practitioners who are interested in the challenges caused by multicultural or cultural issues will also find the discussion useful.

The Structure of the Book

The book is divided into three parts: theoretical grounding, case histories, and scholarly implications. The first four chapters develop conceptual foundations for the framework of Culturally Localized User Experience. Chapter 1 looks at the subject of local culture, and Chapters 2 and 3 study the subject of user experience. For both subjects, I survey the current status of the studied topic, trace the conceptual movement for a broader vision of the notion, and develop and advance my view in the end. In Chapter 1 I establish a dialogic view of culture that connects action and meaning and describes local culture as the dynamic nexus of contextual interactions for requirements gathering in cross-cultural design practices. Chapters 2 and 3 develop a holistic vision of user experience that integrates action and meaning in cross-cultural design: Chapter 2 particularly looks at *why* to have a holistic vision, and Chapter 3 investigates the *how* and *what* in constructing this holistic vision by weaving intellectual traditions of activity theory, British cultural studies, and genre theory. The seven defining features of CLUE are outlined at the end of Chapter 3. Chapter 4 introduces the case of the book, the cross-cultural study of mobile messaging use, and discusses how CLUE worked as a framework for cross-cultural user experience research in this case study.

Individual case studies are brought forth to contextualize theoretical development. While reading all five cases as a whole provides a more complete vision of Culturally Localized User Experience, readers could pick up any of them and group them as they like to complement the reading of the theories and implications.

I begin with two cases that elucidate how action and meaning are interwoven in local uses, with a focus on the dialogic interactions of technology affordances. Chapter 5 looks at how American business professional Sophie used mobile text messaging for emotional support in various work settings in order to juggle work, family life, and friendship. The "artful integration" process was accomplished through her successful negotiation between instrumental and social affordances. Chapter 6 examines Chinese teacher Lili's messaging use in her daily social network. The meaning of the technology conveyed from its social affordance was so important to her that she would ignore the poor usability of the technology. This chapter also introduces a complex picture of various cultural influences during technology use.

Chapters 7 and 8 continue exploring the complexities of local culture beyond the models of cultural dimensions. Chapter 7 studies American graduate student Brian's texting use for coordinating with friends and examines how a precedent genre (instant messaging) shaped the local use of a new technology (text messaging) and the perception of the writing practices engendered (i.e., text messages as conversations) in the American context. Chapter 8 regards Chinese graduate student Mei's late-night message exchanges as a new form of fan innovation and a literacy practice. In comparison to Brian's orality practice, this chapter discusses how different cultural preferences lead to different use and genre patterns of text messaging and contribute to different meanings. Therefore, these two chapters illuminate the complicacy of a dual mediation process influenced by complex local cultural factors.

Chapter 9 traces the messaging use of American college student Emma for three years. It looks at meaning construction and identity work in cross-cultural design in a postmodern era and discusses how multiple identities were constructed in numerous layers of cultural contexts through a process of becoming, where the user was constantly looking for a technology to fit her lifestyle.

Broader implications of the empirical study are explored in the last two chapters. Chapter 10 further develops the framework of CLUE with a consolidated discussion of use cases and investigates how Culturally Localized User Experience is accomplished through user localization at the users' sites. Chapter 11 suggests future directions for the research

and practice of cross-cultural technology design in a glocalization age. Centering on a dialogical approach, it analyzes what the cross-cultural design community could learn from the user localization efforts to design for, invoke, nurture, encourage, support, and sustain Culturally Localized User Experience for emerging technologies.

One of my goals in writing this book is to advocate an activity approach that places concrete user activities on the center stage of design in order to enrich the cultural dimensions approach that has dominated cross-cultural technology design research and practices. A taxonomic view of culture has its own value, but I do not agree on the simplistic tabulation of complex cultural situations in terms of cultural variables or the narrow and literal translation of cultural dimensions into interface features. For me, the cultural dimensions approach is a useful method, but we need a more rigorous design methodology to apply this tool effectively and avoid stereotyping local culture, which is what I have attempted to do in this book.

I remember taking an international business communication course shortly after I arrived in the U.S. In one class we "role-played" a business meeting where I was asked to play "myself," a Confucian Asian woman who would keep silent and only nod at meetings. While I do not speak a lot at meetings, I immediately saw how invalid that widely accepted image and cultural stereotype was: I had an urge to speak during the role-played "meeting," and I still vividly remember that strong urge. That realization has pushed me to voice my opinions about popular cross-cultural design myths over the years, and what follows is one of the utterances. . . .

PART I

GROUNDING

I

Approaching Culture in Cross-Cultural Technology Design

A Chinese college student was learning to use the Chinese version of Windows 3.2—the first graphical user interface (GUI) she had ever encountered—on her new computer. With the help of the translated *The Complete Idiot's Guide to Windows,* she made fast progress. However, every time she opened and moved a file, she was a bit puzzled as to why she needed to click a small yellow rectangular icon on the desktop. She was told that the yellow rectangle was *wen jian jia* (a Chinese translation of file folder), and its function was to organize files. But what is a file folder? Why did she need to organize her files? She had no idea. As someone who was unfamiliar with American office culture, she had never used a file folder before nor had any experience with filing documents—Chinese culture was not as obsessed with paper trails as American culture, at least not at this time in the 1990s. In rare situations, she used a Chinese file pocket, which looked like an American heavy-duty manila mailing envelope, to store her writing papers. Of course, she did not know that the yellow rectangle represented a horizontal tabbed manila folder, a mundane artifact in the American office environment, until she came to the United States for graduate study a few years later. She experienced that "Wow!" moment when she matched the yellow rectangle on her desktop interface with a real manila folder. But for a long time after her arrival, she still put all her computer files under one large folder with a one-level flat structure, just as she had in China—technically a same-sized Chinese file pocket cannot be placed inside another one, whereas a same-sized manila folder can be. It was after she became more familiar with the filing activity of American office culture that she learned to create various folders and subfolders to get her files organized hierarchically.

That student was me. And I was not alone as a confused local user for that file folder icon. I found later that users from some European countries experienced similar confusion (A. Marcus, 1996). In those countries, documents were stored vertically in a cardboard box-like container with a small finger hole located on the side panel of the box. Those users would prefer to see the vertical container's face with the finger hole as the icon for file collection.

The example above is one of many that show how complex and challenging it can be to design for users from another culture. Cross-cultural technology design is not just about translating a dialogue box or localizing an icon—a process of transferring meaning. A visual interface is built on the discursive practices and cultural values it represents (see Selfe & Selfe, 1994). For some local users who are unfamiliar with an activity embodied in design, such as organizing documents in this case, how could they understand what an icon represents? How could they enjoy the functionality of a program and appreciate the affordance of a technology? Therefore, how could the designed technology meet the cultural expectations of local users, support their complex activities in concrete contexts, and empower their agency and mediate their identities in a contemporary situation?

In this book I will investigate the interactions and relationships between action and meaning in cross-cultural technology design. I argue that a design philosophy and model that attends to both action and meaning through the cyclical design process will help the cross-cultural design community to create a technology both usable and meaningful to local users, and I call this integrated approach Culturally Localized User Experience (CLUE). I hope it will bring timely clues and inspirations to this rapidly developing community and serve as a conceptual foundation and resource at a time when so many challenges await.

The central argument of this book is that we need to integrate action and meaning in cross-cultural technology design to augment the everyday lives of local users. This opening chapter explores the unintegrated situation of cross-cultural technology design from the angle of culture, the core of cross-cultural design. My goal is to establish a dialogic view of culture that connects action and meaning in cross-cultural design practices. I first assess the status of culture in cross-cultural design practices, discuss how narrow representations of local

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culture result in poor user experience of localized technologies, and review the movement of capturing local culture from the surface to its core with case studies of three approaches commonly adopted in cross-cultural design. This discussion is further contextualized in a contemporary situation, where I examine the complex interactions between culture, technology, and design and develop a position for technology design that attends to both instrumentality and social circulation. Building on that, I outline a dialogic vision of culture as a semantic space that bridges implementation and interpretation in the end.

The Problem of Culture in Cross-Cultural Design Practices

Culture is a heavily contested term with myriad connotations from different fields such as communication, psychology, sociology, anthropology, science and technology studies, and information systems. It can be used either in a singular form, when we want to regard culture as one constituting entity and highlight its characteristics as a whole; or in a plural form, when we want to emphasize different varieties of culture. Before further developing a dialogic view of culture later in this chapter, I briefly preview my take on culture here. Informed by research in anthropology and ethnomethodology, I regard culture as the meanings, behaviors, and practices that groups of people develop and share over time as well as the tangible manifestations of a way of life, such as artifacts, values, and states of consciousness (Geertz, 1973). In this sense, local culture includes broad sociocultural factors from national/ethnic culture (e.g., collectivism vs. individualism, universalist vs. particularist orientations) and from subgroup culture (e.g., age group, gender, and organizational affiliation), individual factors (e.g., personal background, values, and interests), ways of life, daily activities, and interpretations of these.

Because of the complexities of the notion of culture itself and its multi-voiced connotations from different fields, accounting for local culture is not easy in cross-cultural design: Even though culture takes a central role in a cross-cultural design process, it remains one of the major problems constantly hurting design practices.

The good news is that the essential role of culture has been claimed, proven, and validated in an extensive amount of research literature and real-world cases of market failures where companies did not carefully consider local cultural issues (e.g., DeVoss, Jasken, & Hayden, 2002; Hofstede & Hofstede, 2005; Hoft, 1995; Taylor, 1992; Victor, 1992). As a matter of fact, we see the pervasive term "culture" frequently appearing in cross-cultural design literature. One could expect to encounter the word "culture" in almost every piece of literature, and usually more than once. For example, the importance of culture is well recognized in the set of three official definitions of cross-cultural design provided by the former Localization Industry Standards Association (LISA), an international nonprofit organization founded in 1990 to develop industry standards for IT localization:[1]

> Globalization... refers to all of the business decisions and activities required to make an organization truly international in scope and outlook. Globalization is the transformation of business and processes to support customers around the world, in whatever language, country, or culture they require. (LISA, 2007, p. 1)

> Internationalization is the process of enabling a product at a technical level for localization. (p. 17)

> Localization is the process of modifying products or services to account for differences in distinct markets. (p. 11)

For a product/service to go global, the process of globalization[2] usually consists of two parts, *internationalization* and *localization*. The first step is "isolating and extracting all cultural context from a product" (Taylor, 1992, p. 34); the second step is "infusing a specific cultural context into a previously internationalized product" (ibid). According to LISA, localization covers four main categories: linguistic issues (linguistic adaptation for genres such as user interface, online help, user documentation, and marketing and product collateral materials); physical issues (physical modification); business and cultural issues (the presentation of information, such as local currencies, formats of name, number, time, etc., icons, graphics, and colors); and technical issues (redesigning and re-engineering a technological product to accommodate issues such as double byte characters). Put simply, the localization industry believes

cross-cultural design practice should either remove culture-related modules (e.g., in internationalization) or add them (e.g., in localization) at some point along the design cycle, and culture plays an important role in the processes of both reduction and addition.

In some ways, the concept of culture actually creates more opportunities for the field of IT localization. At an online conference on localization and translation training in 2003, researchers suggested that localization does not have to be limited to the adapting process when translation is involved. It can be "a process of adapting anything to a target locale" (Clark, Drugan, Hartley, & Wu, 2003) or "an interdisciplinary process of adapting an information technology (IT) product to the needs or expectations of a specific target audience" (Drouin, 2003) as long as there is a distinctive culture and locale there; for example, technology design for senior citizens or young children can be regarded as localization.

The bad news is that regardless of the consensus about the importance of culture in cross-cultural design, the application of culture work remains within a narrow scope and on a surface level (Sun, 2002b). Practitioners spend most of their energy on a technological product's form, such as what colors would not work for an audience in a specific country and what page layout would be preferred by some ethnic cultures. As I have argued elsewhere (Sun, 2006), professionals design for operational convenience, without careful consideration of how to support meaningful activity in a local context for social affordance.

To better explain this, let us turn to a popular analogy, the iceberg metaphor, which has been used widely in intercultural communication to describe the complexity of culture. Hoft (1995) proposes that issues of translation, punctuation, color, page layout, and aesthetic appeal are just the tip of the iceberg, and this visible section above the water is only 10 percent of the whole. In contrast, its huge submerged body, invisible to designers and manufacturers, accounts for the other 90 percent of the iceberg and consists of unspoken and unconscious rules (e.g., common knowledge and values shared within a culture). This huge underwater iceberg—the broader cultural context where technological products are situated, designed, produced, distributed, and consumed—needs to be well attended to by designers. The shortsightedness of looking at only the tip of the iceberg results in a product-oriented localization

process that separates product design from product use, and the resultant technological products are detached from their contexts. Many manufacturers do not have an overall vision of localization strategies in product design: Their localization work occurs only at the developer's site, and it ends when the product ships. They are not aware of either the complex interactions between use and design or user localization.

Moving beyond Narrow Representations of Local Culture

Behind this shortsightedness and resultant decontextualization, there is a profound problem in technology design: a disconnect between action and meaning (see Bødker & Andersen, 2005; Svanæs, 2000). In this section, I probe one side of this unintegrated situation: the narrow representation of local culture. When local culture is approached in a confined way, the actual practices of social activities are missing in this understanding, and we see the narrow scope of localization work discussed above. Here I go over three common approaches for capturing local cultural contexts in cross-cultural design, represented by a case each, through which I show the focus of these three approaches move from the tip to the deeper level of the iceberg and explain why they still neglect to portray a more complete picture of local cultural contexts due to their methodological limitations.

DOs and DON'Ts, Anecdotes, and Business Cases

Much of the local cultural knowledge designers have developed over years resides in various forms of DOs and DON'Ts, anecdotes, and business cases.

To envision a local culture, we might want to think of walking into a friend's messy room: Initially the messiness strikes us as strange, yet it shows traces of familiarity, and after a while we might be able to discern the structure behind the apparent messiness. One approach is to see the messiness and then log, categorize, and organize it into ad-hoc cross-cultural communication guides. Lengthy lists of DOs and DON'Ts, oft-repeated warning boxes, and industry case studies make

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up the staple for topics on intercultural communication and interna-
tional business in many textbooks. They come from personal experi-
ences, informal observations, numerous encounters, and even friends'
stories. A typical list of DOs and DON'Ts would include items such as
do be punctual when meeting German businesspeople, but be prepared
for the late arrival of a Mexican collaborator. And an industry case might
look like this: "American toothpaste manufacturer Colgate introduced
a product called 'Cue' in France, but it turned out to be the same name
as a well-known adult magazine. Oops!" These intensive efforts on cul-
tural details often lead to guidelines, rules, advice, warnings, standards,
and handbooks of cross-cultural design in translation, coding conven-
tions, layouts, fonts, graphics, and testing (e.g., Lingo Systems, 2000,
2009; MultiLingual, 2010; Schumacher, 2010).

Nobody can deny the value of this type of experiential know-
ledge; we all know that a deep understanding always begins from initial
encounters and interactions. However, these manifestations of culture
usually represent only the cultural conventions of a dominant culture in
a country (the tip of the huge iceberg). One example is applying "cul-
tural markers" to website localization (Barber & Badre, 1998; Sheppard
& Scholtz, 1999). Barber and Badre define cultural markers as interface
design elements that stand for local cultural conventions, including
national symbols, colors, spatial organizations, etc. They recommend
incorporating cultural markers in web design to increase web usability
and acceptability. For example, an American bank website might want
to use the color green to attract Egyptian customers because green is
associated with fertility and growth in Egypt. Taking the conventions
for granted, this approach tends to neglect the nuances and dynamics of
an ever-changing culture. In some cases, people blindly follow the old
rules without realizing that they are outdated. Barber and Badre cite a
color-culture chart from previous research in which the color white is
associated with death for Japanese culture; however, the connotation of
white has expanded as more and more Japanese brides choose to wear
white Western-styled gowns at their weddings.

Most of the time, cultural manifestations are presented as they are,
without further justification about why we see them. It would be help-
ful to know that a Mexican would show up late to a business meet-
ing because Mexican culture has a less formal perception of time than

German culture does. In a similar way, while designers appreciate DOs and DON'Ts about conducting user research in countries with which they are not familiar, such as not scheduling tests in a particular month, they would find a list of DOs and DON'Ts based on cognitive differences and cultural expectations more valuable than that of logistics information, like this example: A usability test moderator in India needs to dress differently to match the socioeconomic status of the test participants because Indian daily interactions function upon social status. Either a "dressed up" or "dressed down" situation could hinder data collection (Beaton & Kumar, 2010).

This view of local culture captures neither action nor dynamic meaning from the angle of technology design. The validity of the findings is also sometimes questionable, as there are no rigorous methods used to obtain this type of knowledge. Generally this approach is built on a technical/engineering frame of mind, which favors efficiency over culture sensitivity. For Barber and Badre, culture is "a means of distinguishing among the different countries and their respective web-sites" (1998). When the richness of culture is reduced to some means, the whole process of localization is simplified as part of the engineering cycle from the planning stage to the testing stage, detached from its use context. In the pursuit of engineering and automating this process, practitioners need only to attend to delivery and style, such as translating the user interface and resizing a dialogue box, as shown in many internationalization and localization manuals (e.g., Esselink, 2000; Kano, 1995; Lingo Systems, 2000; Musale, 2001). The resulting phenomenon is that localized products and services are usually not appropriate for use contexts.

Value-Oriented Cultural Dimensions

Unsatisfied with shallow manifestations of local culture, researchers seek to understand the structure behind the messiness to better capture local culture, and a series of models of cultural dimensions are thus developed (e.g., E. Hall, 1983; Hofstede, 2001; Trompernaars, 1993; Victor, 1992), among which is Hofstede's landmark study (Hofstede, 2001; Hofstede & Hofstede, 2005). Hofstede regards culture as "collective programming of the mind" (2001, p. 1) and associates culture with values, "a broader tendency to prefer certain states of affairs over

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others" (p. 3). Based on survey results collected from IBM in 72 coun-
tries in the 1970s, he developed the following five cultural dimensions
to compare local culture:

- *Power distance* refers to the extent to which less powerful members of a
  culture expect and accept unequal power and authority distribution.
- *Uncertainty avoidance* measures the (in)tolerance level when the
  members of a culture face ambiguous and unknown situations.
- *Individualism and collectivism* describes the ties between an individual
  member and his or her various groups.
- *Masculinity and femininity* refers to traditional gender roles associated
  with work goals. For example, earnings and recognition are associated
  with a masculine type, and cooperation and employment security are
  associated with a feminine type.
- *Long- versus short-term orientation*[3] describes the tendency to foster
  virtues oriented toward future rewards versus toward more immediate
  results.

Applying a quantitative research methodology, Hofstede generated
cultural indexes for the five dimensions and normalized them to values
of 0 to above 100. For example, a high power distance index (PDI), like
104 for Malaysia, shows that the vertical structure of authority in this
country is more rigid than other countries. Compared to anecdotal evi-
dence of cultural knowledge, Hofstede's framework of cultural dimen-
sions helps designers to focus on "the regularities between cultures" by
reducing "cultural differences to a manageable number" (Gould, 2004,
p. 67) and provides vocabularies and structured models to assess cultural
patterns across nations. It is the most popular approach used in cross-
cultural design among the three reviewed here (for example, Choi, Lee,
Kim, & Jeon, 2005; Ess & Sudweeks, 2005; Faiola, 2002; A. Marcus &
Gould, 2000; Singh & Pereira, 2005; Zahedi, Pelt, & Song, 2001).

A report of cross-cultural information systems research published in
2002 found that 24 of 36 pieces of literature reviewed used some or all
of Hofstede's cultural dimensions (Myers & Tan, 2002). As revealed by
Hofstede in the preface to his second edition of *Culture's Consequences*
(2001), the first edition, published in 1980, is one of the most cited in
the entire *Social Science Citation Index* since its publication. Indeed,
Hofstede's work is so influential that at least two other larger projects

of cross-cultural comparative surveys followed to study cultural values, testing and enriching Hofstede's findings in the 1990s—the Global Leadership and Organizational Behavior Effectiveness (GLOBE) research project, conducted among 62 societies with 150 researchers involved (House, Hanges, Javidan, Dorfman, & Gupta, 2004); and the World Values Survey (WVS), undertaken in 43 societies and with multiple researchers involved (Inglehart, 1997).

While these cultural models help designers see more of the submerged iceberg, they also introduce methodological inaccuracies to design practices: They promote a positivist view of culture,⁴ which strips rich contextual data away during the formation of the formal structure. First, only the dominant cultural values in a national culture are represented in cultural models; other subcultural factors, such as the individual user's gender, age, organizational affiliation, or ethnic group, are ignored. It is an "overly simplistic" treatment of culture (Myers & Tan, 2002). For example, the nation–state is actually a relatively recent phenomenon, occurring in the later part of human history. In cross-cultural design practices, we often see local cultures that are related to a subculture in a country (e.g., text messaging is more popular among teenagers than other age groups in the Western world), but these cultural models cannot help design and localization processes if they are obscured by a set of national culture dimensions.

Second, these views of culture place concrete cultural realities into static dimensions, with an emphasis on cognitive schemas of ethnic groups. Some information systems researchers notice that those value-oriented variables could not fully explain the complex cultural phenomena found in the field when the messiness and complexities of the local contexts (e.g., immediate context) are often neglected and only general patterns originating from the broader social contexts are attended to. For example, Harvey (1997) concludes her research on a comparative study of geographic information systems between German and American users this way: "Hofstede's dimensions of national culture are a good basis for understanding the influence of national culture on organizations' self-representation, but miss the actual practice of social activities" (p. 145). Weisigner and Trauth (2002) agree that "such broad dimensions are perhaps useful only at a high level of analysis (i.e., at the country level) but not at the level of interaction where a variety of

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contextual factors can affect behavior" (p. 315). From an anthropological point, Batteau (2010) comments that culture is treated by Hofstede as "a storehouse filled with collective attitudes cut from similar parts templates," and thus "the dials and knobs of culture can be adjusted to meet the demands of modern industry" (p. 85).

In fact, missing the actual practice of social activities is a common problem in cross-cultural design literature, as we can see from the two representations reviewed so far. As an example, Hoft's book *International Technical Communication* (1995) covers many aspects of internationalization and localization with "international variables," but none of them comes from field studies of use activities in context. In her mapping of international variables (p. 114), all of the variables are static and abstract. When designers follow her suggestions of cultural editing (p. 123), they can only beautify buttons with local translations, though the real goal here is to support complex user activities in their local contexts. When culture is operationalized into abstract dimensions separated from concrete user activities in the localization process, culture is not situated in practices anymore. Moreover, this narrowness misses the use moment when certain kinds of local uses are engendered by particular sociocultural settings and when certain technologies are adopted in a locale to reinforce or transform the social-structural configurations. For example, some East Asian users think mobile text messaging is more suitable for Asian people to express implicit feelings and emotions.

While action is missing, the value-oriented meaning is not rich enough either. The survey Hofstede and his colleagues conducted explored employee attitudes in an organizational context (IBM), rather than in a broader sociocultural context. Survey participants, most of whom were middle class, shared many cultural values and interests concerning their careers and working contexts. Some of the cultural dimensions were developed based on the responses to a limited number of questions; for example, the power distance index was derived from the answers to only three questions. Trompernaars, Hofstede's student, collected his data in a similar way, developing his model based on a 16-question survey and participants made up of managers and administrative staff (Hoft, 1995). Furthermore, E. Hall's model came from personal observation, and Victor's model primarily came from secondary sources. The GLOBE project and the WVS project have similar

limitations as Hofstede's. If we regard Hofstede's study as a form of usability research, then we would have to conclude that the test participants Hofstede chose for his "usability tests" might not match the profiles of our targeted users most of the time, and that the test objectives and focuses might not fit our design situations either.

Clearly, these models were advanced to study cross-cultural communication, usually in an international business context, rather than for cross-cultural design; therefore we need to be more careful when using them to inform design decisions. A literal translation of cultural dimensions into interface design patterns—for example, a website for a local culture with a high uncertainty avoidance index should have a simple and structured layout—might miss other design opportunities to address richer cultural issues and end up falling into the trap of the DOs and DON'Ts approach again. In the conceptual framework for cross-cultural web design that Zahedi and his colleagues proposed (2001), Hofstede's cultural dimensions are synthesized with social constructionist theory to study individual factors and address complex cultural interactions, which can be seen as a move toward the goal of depicting local culture more thoroughly.

Structured Fieldwork Methods

The method of fieldwork is an approach introduced to avoid a positivist view of culture and to capture rich activities at local sites. With a focus on the richness and texture of everyday life, this approach is concerned with the production and exchange of meanings between the members of a society or group in an ethnomethodological sense. Fieldworkers study how users use a product in their natural contexts, just as anthropologists observe aboriginal people, and thus provide thick descriptions of users using a technology in their surrounding culture. Of course this type of design ethnography (see Salvador, Bell, & Anderson, 1999) brings its own disciplinary baggage to HCI design. For example, it lacks formal models for data analysis and knowledge reuse related to IT product design. Dray and Siegel (2007) also note that it risks ambiguous fieldwork data and premature closure in data analysis. As Sullivan (1989) pointed out long before, successful adaptations are needed before the fieldwork method can really contribute to usability research.

Contextual design (Beyer & Holtzblatt, 1998; Holtzblatt, Wendell, & Wood, 2005) is a successful adaptation in many ways. The idea of contextual design is to enter the user's world as an "apprentice" in order to learn and to make observations and inquiries related to the selected focus areas of a client project. Through having a typical two- or three-hour contextual inquiry of each carefully selected individual user by various team members, the design team develops a collaborative understanding of a local context based on five work models: (1) the *flow model* surveying the communication and coordination in which people are engaged at work, (2) the *sequence model* studying the task sequence of work, (3) the *artifact model* investigating the assumptions and role of artifacts in the work, (4) the *cultural model* examining the issues of cultural context in a workplace, and (5) the *physical model* reviewing the physical environment of the workplace.

A contextual inquiry usually employs qualitative methods such as observation, walkthrough, and interview. Compared to ethnographic fieldwork, contextual design maintains a hermeneutic stance in seeking to understand in-situ user experience through empathetic interpretation of a local culture, as well as contextualizes the messiness and richness of a local culture via a set of structured methods. Thus it has been a very popular design approach adopted by big IT companies including Ericsson, Intel, Microsoft, Nokia, and SK Telecom as a participatory method to gather design requirements in general design and cross-cultural design (e.g., Blom, Chipchase, & Lehikoinen, 2005; Jokinen, Karimäki, & Kangas, 2003; Nieminen-Sundell & Vaananen-Vainio-Mattila, 2003; Page, 2005; Vaananen-Vainio-Mattila and Ruuska, 2000; Yi, 2010; Yu & Tng, 2003).

"Context" is a key principle that defines the approach of contextual design. According to Beyer and Holtzblatt (1998), this principle advocates immersing designers into the studied workplace and observing the unfolding work. It is a way of obtaining "ongoing experience" and "concrete data" (p. 47). While the central focus on context contributes to the popularity of contextual design in industry, the scope of the proposed context is limited in the following ways. First, this context refers only to the workplace. As originated to answer design calls for enterprise information systems, the work models of contextual design were developed to examine work practices in an organizational

context, but not to understand social computing practices in an individual context like mobile phones and other information appliances.

Second, this context has "the problem of unintegrated scope," as Spinuzzi assesses (2002, p. 4). The "macroscopic" understanding of a local context, an understanding of the level of cultural–historical activity, is accomplished through data-collection methods (e.g., targeted observations, walkthroughs, and interviews) that function at the "mesoscopic" level—a level of situated, goal-directed action.[5] The mismatch between the project focus and the data-collection tools implies that there is an underlying work structure that has "a causal, foundational relationship with the other levels." This conflicts with sociocultural theories that support "co-constitutive" relationships between levels and thus causes "the problem of unintegrated scope." Furthermore, it misses "the reciprocal changes" across different levels (p. 13).

Third, as something significantly relevant to context, culture is unfortunately given insincere support in this design methodology. Guidelines about cultural issues are superficial and brief, and the cultural model primarily studies policy, power influence, and group frictions. It is doubtful how this cultural model can help to collect data hidden in the underwater iceberg without deep engagement (see Sullivan & Porter, 1997); Randall, Harper, and Rouncefield (2007) comment that this use of context lacks "a sociological sensibility" and claim that "[c]ulture is perhaps the most ambiguously articulated concept in Beyer and Holtzblatt's exposition" (p. 29). As a matter of fact, the cultural model is skipped in the process of rapid contextual design (Holtzblatt et al., 2005).

Therefore, a structured fieldwork method like contextual design is still narrow in its scope, as it contextualizes only half of the process. Its interpretation of the local culture tends to focus on the immediate context of where a user is situated, and it fails to connect the immediate context with the broader sociocultural context, which is important in localization practices. This is also a common limitation for current fieldwork methods, i.e., those methods that focus just on the aspect of tool-mediated production of an IT artifact in context, but rarely explore its sign-mediated communication, though they come from a hermeneutical stance that values meaning creation in cultural practices. Thus they are good for gathering design requirements for instrumental convenience but are poor at exploring design options for social

affordances. Other limitations include studying product use either only at certain stages or for a short period. Long-term research with a focus on a developmental aspect is also very hard to find in this approach.

Compared to large-scale, cross-cultural studies on value-oriented cultural dimensions, most projects employing structured fieldwork methods remain as scattered case studies. While there emerges reports of cultural factors (e.g., Thomas, Haddon, Gilligan, Heiznmann, & de Gournay, 2005) assembling case studies to "make sense of national differences" (p. 13) with a sociological sensibility, it is still too early to expect coherent interpretations of the findings on the global level for two reasons. First, it is more difficult to conduct a large-scale, qualitative study across societies and cultures than to do a quantitative project like the GLOBE study methodologically. Second, there is an internal tension between "contextualized interpretations" brought by fieldwork methods and "standardized data collection" of multinational comparisons (Livingstone, 2003, p. 494).

In summary, the three ways of capturing local culture are presented in a chronological order; at the same time, they form a lucid trajectory directing design research from the surface to the deeper level of the underwater iceberg, and thus make a continuum of local cultural knowledge from limited to more complete. Applying Geertz's view of culture to assess the representations of local culture in terms of action and meaning, the approach of DOs and DON'Ts does not have a systematic way of sorting out action and meaning; the approach of value-oriented cultural dimensions looks only at a static view of meaning; and the approach of structured fieldwork methods intends for both action and meaning, but ends up depicting action with an unintegrated scope and meaning just coming out of an immediate context. Clearly a richer and more dynamic view of local culture is needed for the success of cross-cultural design.

Technology Design in a Technological Culture

To be more accurate, as the three approaches aim to better capture and present local cultural contexts for technology design in order to create products appealing to local users, what they investigate for culture is

actually part of collecting requirements and determining needs of the design process. So the representation and manifestation of local culture should be fully examined in the nexus of technology, design, and culture. Questions thus arise: What is technology? What is technology design? And what does technology design mean to our contemporary situation?

Technology is a modern word; for example, Karl Marx never used this word in his work of the early 19th century (Murphie & Potts, 2003), but no philosopher and thinker of today could skip it. To the same extent, *technology* is as much a challenged notion as *culture*, which deserves a standalone book just for the review of its numerous connotations. Indeed, cultural studies scholars Slack and Wise (2005) claim that, since technology assumes a crucial role in our everyday life (culture is a whole way of life for the school of cultural studies), it is meaningless to treat culture and technology as "separate entities" when examining the complex relationship between technology and culture (p. 4). For them, technology should be defined "in terms of articulations[6] among the physical arrangements of matter, typically labeled technologies, and a range of contingently related practices, representations, experiences, and affects" (p. 128). Because "the particular articulations that constitute a technology *are* its context" (p. 128–129, emphasis as it is), *technological culture* depicts the reality of our contemporary situation better than culture and technology treated separately. To put it this way, the relationship of technology and culture forms "the central problem of technological culture" (p. 4).

From an anthropological standpoint, though the term "technology" is a modern phenomenon, the connotation is not new. Tool-making precedes thinking, and Marx did write a lot about the machinery of production for his time. Batteau (2010) traces the development of technology in cultural evolution and lists three core components of technology: instrumentality, social circulation, and engineering knowledge (e.g., instructions and standards). An object of local ingenuity, like a digging stick, embodies instrumentality, but it is not considered technology until after its entrance into social circulation. He further explains: "*Tools* are merely implements, innocent of the purposes to which they are put. When a tool enters social circulation as a technology, it picks up the values, social projects, and ultimate purposes of

those who introduced them, giving those values and purposes a shape and sturdiness they would otherwise lack" (p. 21, emphasis as it is). This distinction clearly marks the boundaries of "technology," which prevents a loose use of the term in the discourse of technology design.

The process of social circulation manifests *the rhetoric of technology,* which is "the rhetoric that accompanies technology and makes it possible—the rhetoric that makes technology fit in the world and makes the world fit with technology" (Bazerman, 1998, p. 385). For Edison's invention of the incandescent light bulb to become a household technology (see Bazerman, 1999; Hughes, 1999), it went through a process of "enlisting supports of numerous publics (financial, legal, corporate, public, technical)" and "arguing for value in terms of business, law, government, the public, and consumers" (Bazerman, 1998, p. 384).

The core of technology also indicates that, for a technology, being usable—derived from its *instrumentality*—goes hand in hand with being meaningful on a cultural circuit with its engendered meaning through *social circulation.* The third element of engineering knowledge is actually the external demonstration and stabilization of instrumentality in social circulation.

Design matters profoundly in a technological culture. It is "basic to all human activity" (Papanek, 1972, as cited in Julier, 2008, p. 40), and it is "the crucial anvil on which the human environment, in all its detail, is shaped and constructed for the betterment and delight of all" (Heskett, 2005, p. 1). The notion of design encompasses contested meanings in contemporary society as well. Describing design as "a highly entrepreneurial profession," "a maturing academic discipline," and "a global phenomenon" (p. 1), Julier (2008) defines design as "a culturally specific practice which is driven almost entirely by strategies of differentiation" (p. 3). I argue that, with a technology as design outcome, *technology design* embodies a constellation of design processes, design communication, standards and regulations, manufactured products and deliverables, and production and consumption that aims to transform our lives and surrounding contexts. In addition, I would clarify that, while the approaches explored and discussed in this book apply to cross-cultural design issues for a vast range of technologies, I primarily look at interactive technologies or information and communication technologies pervasive in everyday life.

To understand how technology design functions on a complex cultural circuit, let us look at a real case occurring in a remote Indian village (Prabhu, 2007). Designers noticed that every day, young women had to walk one hour's distance from the village to a well to carry water for the whole family; designers built an electric-pumped well inside the village to help those women. However, the newly built well suffered an incident shortly after it was completed: It was buried with big stones and could not be used. Assuming it was a mischievous act from naughty kids, designers removed the stones and fixed the well. To their dismay, the well had another incident a few days later; this time the electric pump was damaged. After some covert investigation, they found the damages done to the well did not come from naughty children as they had believed, but from the target users who they expected would most benefit from this well—young women of the village.

Why did some young women want to damage a well that would save them time and labor? It turned out that, in an Indian village, married young women have the lowest status in a big family and they must listen to the orders of their mothers-in-law. Walking one hour to carry water was tedious and laborious; however, that was the only time in the day they could enjoy friends' company and have some time for themselves. When the well was built, they did not have an excuse to leave the house for an extended time period during the day and thus were deprived of quality time that was important and meaningful to them. The repercussions for these young women were similar to the riotous acts of destroying machines that German overworked wage-workers engaged in during the 19th century, even though the well's designers might defend that their goals were different (they were not trying to make profits by increasing work efficiency like the capitalist owners of the German plants): The well was introduced to make users' lives easier. Yet in a globalization age, designers might not realize that a design solution of goodwill could seem insensitive and sometimes rude to local users.

This kind of unintended, negative side effect that a technology could introduce to a local ecology can be termed "the water hyacinth effect." Water hyacinth is a beautiful, fragrant flower that has plagued the Lake Victoria area in Africa (Impiö, 2010; "Water hyacinth," 2010). It was brought from Brazil and planted in private ponds in Nairobi in

the 1980s by a British gardener who had a naïve idea of decorating gardens. Far away from its natural rivals at home, this invasive weed grows like a virus on its new continent, occupies a large freshwater area, and negatively impacts local ecology by blocking boat access, sticking to the feet of water birds, and cultivating mosquitoes and other insects that carry and spread diseases. Determining how to eradicate this plant is a big headache for local governments.

The water hyacinth effect alerts designers about possible dark sides of a seemingly goodwill technology. For example, when social activists acclaim the democratic progress brought by the new technology of short messaging service (SMS) in countries like the Philippines,[7] conscientious designers should also be concerned about the possibility of introducing more uproar between tribes in countries such as Kenya and Nigeria, where text messaging and social media make spreading hateful rumors much easier. Impiö points out that "the lack of cultural understanding" and "stubbornly pushing Western ideals and operating models to African countries" (p. 25) are two main factors resulting in these unintended negative effects. To do no harm, technology designers from a Western culture should reconsider their commitments to the values that they assume are important—such as individualism, privacy, equality, autonomy, creativity, and liberation—in the countries where the designed technology would be distributed (Flanagan, Howe, & Nissenbaum, 2008).

Indeed, designers should be aware that they are in the "consequence business," as design practice is characterized as "an unequivocally interconnected, global, and consequence-creating endeavor" (Chochinov, 2009, p. 8). With an increasing consensus among designers on the values a technology embodies and the consequences it could hold to a local culture, more and more people take part in the movement of "design for social good" in the field of industrial design (e.g., Chochinov, 2007; IDEO, 2008; Pilloton, 2009; Smith, 2007; Thackara, 2005). In the field of computer systems design, the teams of "Value Sensitive Design" (e.g., Friedman 1996, 1997; Nissenbaum, 2005) and the Group of Computer Professionals for Social Responsibility (CPSR) are making bold efforts to bring sociological sensibility and humanistic values such as dignity, justice, and welfare into technology design practices.

Among these myriad efforts to achieve culturally sensitive design, culture has become a more integral part of the design process and has been advocated as a usability goal,[8] as a design tool, and as a research methodology. The practice of advancing culture as a design tool is popular in the field of instructional design, and various frameworks and tools have been put forward. For example, Lee (2003) proposes the "Cultural Modeling Framework" in instructional design to address student populations of color and those living in poverty. Likewise, Eglash, Bennett, O'Donnell, Jennings, and Clintorino (2006) suggest "Culturally Situated Design Tools," web-based software applications, to help Native American and African American students grasp mathematical principles, as part of their ethno-computing movement. As to culture as a research methodology, more and more social science theories and cultural theories are being introduced to guide technology design processes. Examples include using cultural theories to design mobile phone prototypes (Satchell, 2008), regarding "current design practices as a form of social research" in an approach of "culturally embedded computing" where the design choices and resulting implications are more important than the actual design (Sengers et al., 2004), and applying interpretive analysis as a framework of "interaction criticism" to examine design practices in HCI (Bardzell & Bardzell, 2008).

To conclude, technology design is a cultural practice—"the cultural production of new forms of practice" (Suchman, Blomberg, Orr, & Trigg, 1999, p. 404). Numerous case studies from the field of science and technology studies have demonstrated that technological artifacts are culturally constructed (e.g., MacKenzie & Wajcman, 1999; Pinch & Bijker, 1987). The role of technology design in a technological culture could be further contextualized with a deep understanding of a critical theory of technology (Feenberg, 1999, 2002). Criticizing a determinist view of technology, Feenberg believes that, on the one hand, technology embodies cultural values that influence our ways of using it, shape our lives, and eventually integrate us through interaction; on the other hand, the view of technology constituted as a cultural system offers opportunities for alternative modernity and social transformation through "a politics of technological transformation" (2002, p. 13). He combines philosophical substantive theory that regards technology as a form of domination and control with social constructivism that

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sees social values and interests constructed in the development of tech-nology. In this regard, Value Sensitive Design and other participative design movements benefit from the intellectual contribution Feenberg made: "Most fundamentally, democratization of technology is about finding new ways of privileging these excluded values and realizing them in the new technical arrangements. I call this process 'democratic rationalization' because it translates public demands into technically rational advances in design" (2004).

Clearly, the possibility of developing culture-sensitive technol-ogy designs will not truly loom if a singular model of modernity in technological development has not been challenged and falsified. A mindful cross-cultural design that values cultural diversity is fun-damentally founded on a philosophy of technology that believes in "cultural variety in the reception and appropriation of modernity" (Feenberg, 1999, p. 183). In contrast, a singular version of modern civi-lization "gradually homogenizes every other difference as it obliterates geography and subverts all traditional values" (Feenberg, 2002, p. 15). Therefore, cross-cultural design is valuable for democratic rationaliza-tion. Furthermore, opposing a determinist attitude to technology, the position of "constraining and enabling" is crucial in Feenberg's theory of technology to develop a proposal for alternative modernity based on different paths of technological development. It is a recurrent theme in cross-cultural design as a technology interacts with local culture, and we will see more discussion about this in later chapters.

Last, I want to emphasize that it presents a noteworthy stance as an author when I decided to interpret and investigate computer system design, software development, and IT implementation as technology design in this book. This stance signifies a shift in design philosophy that considers developing computing applications in a broader sociocultural horizon, and a focus on humanistic values and commonalities for tech-nological artifacts. In this sense, while factors such as efficiency, effec-tiveness, and error-free are still highlighted in design practices, designers do not think only of "the object of instrumentality"—using Batteau's term—to develop a tool for augmenting a user's work and life, but also begin to explore the position and meanings of this object in the user's life and surrounding contexts, i.e., social circulation. It is a technology, more or less, with a sociological sensibility. It is not value-free: It comes

from a particular sociocultural context and will shape and change the sociocultural contexts in which it will be introduced.

Advocating a Dialogic View of Local Culture for Technology Design

The case of the Indian well shows the sophistication and intricacy of capturing local culture in the process of social circulation. Representing local culture in the design process seemed pretty straightforward when local technological and economic conditions were considered; however, the local user culture was more complicated than it looked on the surface. Even though DOs and DON'Ts, value-oriented cultural dimensions, and structured fieldwork methods could offer insights into the actual design of the electric-pumped well for this particular user group, none of them would be able to anticipate the negative impact on the lives of the targeted users as the well altered their lifestyles. Culture here is mainly treated as a usability goal in the design process without a full inquiry into the role that culture plays in this process. Therefore, the three views of culture are incomplete. Indeed, the three approaches of capturing local culture function as "requirements gathering" in the design process, also called "requirements analysis," which is a beginning step in software development to determine the needs and goals of users. Due to this instrumental orientation on representing local culture, it is easy to miss the fact that the technologies being developed are also making culture, influencing and altering local culture, and becoming part of the local culture.

Going back to the iceberg model to look at local culture, we need to be aware that the iceberg does not stay statically in the water (i.e., the outside world, more specifically, global culture) but is growing itself and interacting dynamically with the surrounding waters. The inside of the iceberg constantly changes as time passes. Moreover, some part of the iceberg might be melting while in contact with the surrounding waters. In the age of globalization, culture is a dynamic process in which meanings, objects, and identities flow across institutions, nations, and generations (G. Marcus, 1995; Sassen, 1998). Local culture

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is concretely an open, back-and-forth dialogue of insiders and outsiders, of the local and the global, of diverse factions. It is hard to separate local culture from global culture. Both local culture and global culture are so closely intertwined that the former is actually one part of the latter.

For that reason, we need to have a dynamic and open-ended view of culture to tackle local cultural issues more effectively in cross-cultural technology design. This view treats culture as emergent, becoming, practiced, temporal, and thus contested (Myers & Tan, 2002; Slack & Wise, 2005; Weisinger & Salipante, 2000). The most provocative characteristic is culture in the making. Based on Giddens' structuration theory (1984) that structure and action constrain each other recursively, Weisinger and Salipante describe culture as "a socially enacted, dynamic process involving the reproduction and revision of practices," and they believe this view "captures a much richer conceptualization of the construct, recognizing the simultaneity of (a) similarities and stabilities and (b) contestation and change" (p. 384).

Therefore, I argue for a dialogic[9] view of culture that is both robust and flexible to study local culture and offer a more complete vision of culture for technology design. Here, culture is dialogic as an open set of practices and as an energetic process with meanings, objects, and identities flowing across sites in diffuse time–space. It is concerned with the production and the exchange of meanings between the members of a society or a group. Meanings are produced and circulated through several different key processes, including representation, identity, production, consumption, and regulation of the cultural circuit within a technological society (S. Hall, 1997).

According to du Gay, Hall, Janes, Mackay, and Negus (1997), "[the] two meanings of the word 'culture'—culture as 'whole way of life' and culture as 'the production and circulation of meaning'—constitute a recurrent theme" (p. 13) in defining what culture is. To me, these two aspects are not either/or options in an articulation for culture, but constitute a more complete reality of culture. In technology design and use, we seek to understand the "whole way of life" of local culture and articulate it into the design process (i.e., a social circulation process of "the production and circulation of meaning"). As design extends to use, the newly built tool becomes a new addition to a way of life,

participates in and contributes to the meaning production and circulation in a local context, and becomes a technology.

The dialogic view of culture can be complemented by the characterization of culture as "a semantic space" by John and Jean Comaroff (1992):

> [W]e take culture to be *the semantic space, the field of signs and practices, in which human beings construct and represent themselves and others, and hence their societies and histories.* It is not merely an abstract order of signs, or relations among signs. Nor is it just the sum of habitual practices. Neither pure langue nor pure parole, it never constitutes a closed, entirely coherent system. Quite the contrary: Culture always contains within it polyvalent, potentially contestable messages, images, and actions. It is, in short, *a historically situated, historically unfolding ensemble of signifiers-in-action, signifiers at once material and symbolic, social and aesthetic.* (p. 27, emphasis added)

Here, practices and meanings are constituted in "a semantic space" where the collective meets the individual and where implementation (instrumental aspect) interacts with interpretation (social aspect) in a dialogic manner. In this sense, *local culture is both a site of the dynamic, ever-changing nexus of contextual interactions, and an assemblage of myriad articulations as a semantic space consisting of meanings and practices.*

Regarding culture as a semantic space constituted dialogically can help us form a more complex picture of cultural realities in cross-cultural design. This social practice view of culture places rich user activities on center stage and thus embodies vivid meanings. Compared to the other views of culture surveyed earlier, this view of culture is in the same camp as a hermeneutic approach. However, a dialogical view looks further and is deeply situated in local practices with a recursive process of structuration between structure and agent, between the context and the individual. This lens recognizes the merits of cultural dimensions models and structured fieldwork methods, and treats them as part of the dynamic interactions when the patterns from cultural models or fieldwork methods are articulated into a semantic space. So far I have primarily looked at the conceptual value of the dialogic view of culture; its methodological implications are reserved for further discussion in Chapter 4.

Conclusion

The central question of this chapter is how to approach local culture for cross-cultural technology design in a technological culture. Because of the disconnect between action and meaning in technology design, a sound solution needs to integrate both and capture local culture as dynamic and emergent. To develop that, I study three ways of representing local culture as "requirements gathering" in technology design and assess their methodological weaknesses in terms of action and meaning. Through a comparison of the three, I reveal that these narrow representations overlook rich activities in local culture and leave out dynamic meanings in technology design. Therefore, I argue for a dialogic vision of culture as a semantic space for technology design that addresses both implementation and interpretation.

A full grasp of this dialogic view of culture depends on a critical understanding of the complex relationships between technology, culture, and design in a contemporary society. Cross-cultural design is never neutral or instrumental. It is a site of becoming, and "a scene of struggle" (Feenberg, 2002, p. 15). Four pairs of dialogic relations emerge out of the discussion: (1) a view of culture that integrates practices and meanings, (2) a position for technology that is enabling and constraining, (3) an approach to technology design that aims for both instrumentality and social circulation (i.e., both the tool aspect and social aspect), (4) and a motive for cross-cultural technology design that should be both usable and meaningful. They are the key terms that form the scaffold of the design methodology of CLUE, and these dialogic relations will be constantly revisited and investigated in later chapters.

My goal for the first four chapters is to lay the groundwork for *Culturally Localized User Experience*. I chose to focus on the conceptual construction of *local culture* in Chapter 1, reserve the theory-building of *user experience* for Chapters 2 and 3, and explore the methodological implications of a construct that integrates both—*culturally localized user experience*—in the context of the comparative study of mobile text messaging use in Chapter 4. After that, we will move into an intriguing collective case study of mobile messaging uses in two cultural contexts.

In the next chapter, we will look at cross-cultural design from the angle of usability and user experience research, and work on developing a design and research framework that brings together action and meaning in cross-cultural design. While Chapter 1 examines the narrow representation of local culture, Chapter 2 examines the narrow conceptualization of usability in design practices. The former sees the meaning aspect but ignores action; the latter addresses only action, and thus it necessitates a holistic approach to user experience.

Notes

1. After LISA's insolvency in February, 2011, other international organizations such as the Translation Automation User Society (TAUS) and the Globalization and Localization Association (GALA) continue to develop industry standards for the field.
2. Globalization is a concept with complex political, economical, and cultural implications. In most parts of this book, globalization is used to provide a backdrop to the discussion of cross-cultural technology design and refers to business decisions and practices. A more theory-informed discussion of globalization can be found in Chapter 11.
3. This dimension was not added until the second edition of *Culture's Consequences* (2001). It was developed based on Confucian philosophy.
4. For a similar argument about the positivist paradigm, please see Ford, Connelly, & Meister (2003).
5. For a more detailed clarification of the difference between an activity and action, please see the section on activity theory in Chapter 3.
6. A cultural studies view of articulation refers to the contingent connections embodied in an entity when forming its unity. For a more in-depth discussion of articulation, please see the section on British cultural studies in Chapter 3.
7. SMS played a significant role in organizing massive protests rapidly to end the dictatorship of President Estrada in the Philippines in 2001 (Rheingold, 2002).
8. I will further elaborate on how culture is advanced and incorporated as a usability goal in the next chapter.
9. For an in-depth discussion of dialogicality, please see Chapter 11.