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An Ethnorelative Framework for Information Systems Design

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ABSTRACT

IT artifacts are connected to our lives in significant and complex ways. The consideration of culture in designing information systems for a global context will become increasingly important. This paper develops the concept of cultural values in relation to information, technology, and people (ITP). In an effort to facilitate a more robust analysis of culture with respect to information systems design, I develop an ethnorelative framework in which designers can begin to assess the “cultural geography” of the target audience in relation to their own. This framework has implications for the Technology Acceptance Model (TAM), but it is not focused on the evaluation of user behaviors in terms of perceived usefulness and perceived ease-of-use, per se. Its goal is to provide a heuristic for designers to understand their own cultural values relative to users of other national cultures.

Keywords

cultural values, ethnorelative, Hofstede, information systems design, national culture

INTRODUCTION

Orlikowski and Iacono call for research focusing on IT artifacts in order to understand the significant and complex ways in which they are connected to our lives, cultures, practices, institutions, social relations, politics, and local and global contexts (Orlikowski and Iacono 2001). Information systems design (ISD) methodologies, with their potential for economic, technical, and organizational changes, have built-in value biases reflecting the value priorities of the culture in which they are developed (Ess 2002b). The products of ISD methodologies, the designed systems, may not be acceptable or appropriate in cultures with value orientations different from the one in which the system was developed (Kumar and Bjorn-Andersen 1990).

Values are an integral component of our cultural experience. I begin this paper by discussing the multifaceted nature of values and the overlapping concepts of cultural assumption, cultural values, and social norms. I then discuss how values are embodied within our cognition, within information and within technology. Then, I introduce specific measures of cultural values devised by anthropologists and interculturalists and settle on Hofstede’s cultural values dimensions as a framework from which to assess the cultural geographies of designers and clients.

A framework for understanding cultural values in terms of Information-Technology-People (ITP) is then offered. After breaking down the potential ITP impacts and/or qualities of the different values dimensions, I offer a visual framework for examining how to integrate dimensions as a guide for designers of information systems. I then discuss the limitations of the proposed visual tool in terms of contextualization and offer suggestions for further research. Finally I summarize my discussion and approach to cultural values in IT and present some conclusions.

Although this paper has implications for TAM, it does not examine the resulting behavior in terms of perceived usefulness and perceived ease-of-use, per se. Rather, its goal is to provide a heuristic for designers to understand their own cultural values in relation to their clients who in a global context might have different cultural values. This paper employs a socio-cultural-cognitive focus not a behavioral focus. This paper also assumes as axiomatic that designers will be able to distinguish their own individual values in cases where they contrast with the cultural values described by the dimensional continua. The value for the designer is that this paper offers a framework for understanding, which integrates information as well as technology and people into the design equation.

CULTURAL VALUES

Values are the cultural heuristics that drive much of our behavior. We are immersed in culture from the day we are born and are conditioned by culture to selectively perceive and attribute meaning to all of the objects, phenomena, and spaces we encounter every moment of every day. We perceive “reality” as it is culturally defined, and make judgments of what is good or right based on the values inculcated within us through culture. It is important to understand that values exist as part of a larger cultural system and that an analysis of national cultural values dimensions has its limits despite its popularity among researchers interested in culture.

Stewart and Bennett (1991) distinguish between cultural assumptions, cultural values, and social norms. These distinctions allow us to examine the complex nature of values systems in terms of the interplay of cognition and behavior. Cultural assumptions are "abstract, organized, general concepts which pervade a person's outlook and behavior." They define what is real in an existential sense and we cannot imagine alternatives to them. For example, Americans think of themselves as individuals, the world as inanimate (i.e., non-volitional), other people as competitive but capable of cooperation, and action as necessary for survival. Assumptions are not behaviors, though we may be able to infer them from behaviors.

Cultural values refer to what members of a culture consider good or desirable. They prescribe actions and ways of being that are better than other ways. Values are not behaviors either, rather the governors of behaviors, possessing content and emotion that contribute to the social reality. We can think of values as *oughtness* (Kluckhohn and Strodtbeck 1961), as having motivational power. We typically don't pay attention to events going on around us when things are happening as they *ought* to happen, making values something normally invisible in our daily lives.

Social norms are the attempts to behave in ways that fulfill social expectations. They may contradict values such as when the value of self-reliance is violated through the taking out of a loan. Yet taking out a loan fulfills social expectations that we understand as (paradoxically) furthering the value of self-reliance.

EMBODIMENT

Cultural values permeate information, technology, and people in ways that are sometimes difficult to differentiate because of the emergent nature of culture—emerging from the interplay of intrapersonal cognitive structures and extrapersonal structures in the world. Cultural values are inherent in people because they are embedded within cognition as schemas. Cultural values are forms of information that are shared as cultural schemas, transmitted between persons and across generations. Sometimes cultural values are embedded into the design of technology in order to foster certain forms of social interaction. I want to briefly examine how cultural values are embedded within cognition, information, and technology before turning to a discussion of specific cultural values dimensions and an ITP analysis of the IT literature regarding cultural values.

People

How are cultural values embedded within cognition? They exist as components of cognitive schemas, strongly connected clusters of cognitive elements that help us to process information (D'Andrade 1995). We share the intrapersonal dimensions of culture when we interact with others. In sharing these intrapersonal dimensions, schemas are activated. Activation evokes meanings, interpretations, thoughts, and feelings. The cultural meaning of a thing, which is distinct from the personal cognitive meaning, is the typical interpretation evoked through life experience, with the acknowledgement that a different interpretation could be evoked in people with different characteristic life experiences. In some cases our experience is intracultural, where we share a similar cultural frame. In other cases our experience is intercultural, where we are sharing different cultural frames. The meanings evoked by one person in relation to a particular extrapersonal structure may not be the same as those evoked in another. In fact, the meanings evoked may not be the same within the same person at different times, for they may experience schema-altering encounters in the interim. The ways in which we share these intrapersonal dimensions of culture makes each person a junction point for an infinite number of partially overlapping cultures (Strauss and Quinn 1997).

Information

How are cultural values embedded within information? In one sense, cultural values are essentially a form of "meta-information." They are abstract concepts (i.e., information), possessing content and motivational power, that help us determine what is good or desirable. As cognitive beings we are confronted with lots of data in our daily lives from which we need to make sense. Cultural values form part of the cognitive meta-information with which we identify salient patterns among the sensory data we experience and help transform it into information and knowledge. In another sense, they are embedded in the patterns we are sensitized towards recognizing, and which activate our cognitive schemas. The notion of private information has embedded within it the cultural assumption of privacy, derived from the cultural value of individualism and the social norm of respect for individual autonomy. Americans, for example, consider a diary as an artifact containing private information and violations of that privacy as wrong. Information in this instance consists of both meta- (private) and schematic (diary artifact) information.

Technology

How are cultural values embedded within technology? Cultural values are embedded within technology as mechanisms for fostering particular types of social interaction. They are embedded through the design and arrangements of our technological artifacts (Winner 1986). Winner pointed out the example of bridges in Long Island, NY designed by Robert Moses to support racist policies. Proponents of computer-mediated communication (CMC) technologies presume CMC will inevitably convey and reinforce specific cultural values, i.e., free speech and individualism and the flattening

of traditional hierarchies (Ess 2002a). Hall’s high- and low-context communication dimension has direct implications for email and CSCW systems, where low-context values are embedded in the design of these systems through the reliance on text communication (Ess 2002b).

CULTURE’S DIMENSIONS

Anthropologists have developed a variety of dimensional models of culture, which don’t capture the emergent nature of culture but function as pragmatic heuristics for examining culture. Dimensional models posit a series of cultural attributes that sit upon continua. Any culture under examination can be placed somewhere along these continua and be compared to other cultures in terms of those attributes. Kluckhohn developed a series of five cultural dimensions that she labeled *human nature, man-nature relationship, time sense, activity, and social relations* (Kluckhohn et al. 1961). Trompenaars devised eight dimensions: *universalism vs. particularism, analyzing vs. integrating, individualism vs. communitarianism, inner-directed vs. outer-directed, time as sequence vs. time as synchronization, achieved status vs. ascribed status, equality vs. hierarchy* (Trompenaars and Hampden-Turner 1998). Douglas devised a *Grid/Group* matrix (Gross and Rayner 1985). Hall developed the concepts of *high-context/low-context* and *monochronic/polychronic time orientation* (Hall 1989). One can study culture using any of these dimensions, but the dimensions most often used are the ones developed by Hofstede. I will focus on Hofstede’s national culture dimensions because they have been validated repeatedly through statistical analysis and by many researchers since their development in 1980 (Ford, Connelly and Meister 2003). They have also been the focus of recent intercultural research that attempts to link dimensions of national culture to personality traits (Hofstede and McCrae 2004; McCrae and Terracciano 2005).

Using an IT metaphor, Geert Hofstede described culture as “the collective programming of the mind which distinguishes the members of one group or category of people from another” (Hofstede 1991), which points to the intrapersonal dimensions of culture. He derived five value dimensions of culture from surveys answered by IBM employees in different countries. Statistical analysis of the surveys revealed common problems among employees, but with solutions varying from country to country along these dimensions:

Cultural Values Dimension		Attribute Description
PDI	Power Distance Index	Social inequality, including the relationship with authority
IC	Individualism versus Collectivism	The relationship between the individual and the group
FM	Femininity versus Masculinity	Concepts of masculinity and femininity: the social implications of having been born as a boy or a girl
UA	Uncertainty Avoidance	Ways of dealing with uncertainty, relating to the control of aggression and the expression of emotions
LTO	Long-term orientation versus short-term orientation	Fostering of virtues related to future rewards such as perseverance and thrift versus those related to respect for tradition, “face”, and social obligations

Table 1. Hofstede’s Cultural Values Dimensions

Recently, Hofstede added two more dimensions to his national cultural values model (Hofstede 2008). These dimensions are based on the work of Minkov (2007) which delineates the values of *Indulgence versus Restraint* and *Monumentalism versus Flexumility*. Indulgence refers to the allowance of relatively free gratification with respect to leisure, merrymaking, spending, consumption and sex. Restraint refers to the control of such gratification, where people feel less able to enjoy their lives. Monumentalism, which is correlated with short-term orientation) occurs in societies that reward people for behavior that embodies pride and unchangeability. Flexumility (flexibility plus humility) reflect self-effacing behavior, and has been relabeled *Self-Effacement* by Hofstede in his updated dimensional model.

The addition of dimensions to Hofstede’s model and the variety of dimensions offered by other researchers above illustrates the limitations of dimensional models of culture as deep analytical constructs for culture. Researchers are immersed in their own cultural experiences and will tend to devise dimensions that speak to their own understanding of what they are observing. The LTO dimension, for example, was not originally identified by Hofstede, but rather by researchers of Asian origin, and originally labeled Confucian Dynamism. Minkov’s dimensions are another example that derives from his experiences in the countries of Eastern Europe and Arabic speaking countries. The advantage to these dimensional models, however, insofar as concerns this ethnorelative framework, is that they are extensible. More dimensions can be added as a way of enhancing the creation of cultural geographies.

Researchers have applied Hofstede’s dimensions to a variety of problems related to IT, and have found them to be correlated to or explanatory of the phenomena under examination. The IC dimension has been applied to the analysis of attitudes towards technology and distinct ways of implementing it (Tully 1998), including the reluctance of reporting bad news of “runaway software projects” (Smith 1999). It has been examined as a factor in the choice of Asian and non-Asian

females entering IT education (Nielsen, von Hellens, Greenhill and Pringle 1997). Some researchers have used these IC and PDI dimensions to examine attitudes in IS professionals in different cultures (Bryan, McLean, Smits and Burn 1994). Others have analyzed collaborative processes for group support system using IC and PDI dimensions (Rahmati 2002; Reinigand Mejias 2003) or only PDI (Tan, Watson, Wei, Ramanand Kerola 1993). The adoption of IT infrastructure has been studied in terms of UA (Png, Tan and Wee 2001). UA and IC dimensions were factored in the analysis of online auction trust behavior (Chong, Yang and Wong 2003). Hofstede's dimensions have also been used in evaluating the design of a variety of websites (Gould, Zakaria and Yusof 2000; Marcus and Gould 2000; Simon 2001).

Some researchers have branched beyond Hofstede's national culture to include other cultural dimensions. IC and UA was combined with high-context/low-context communication contexts to examine the task-technology fit among members of virtual global teams (Massey, Hung, Montoya-Weiss and Ramesh 2001). Zakour's proposition of an extended TAM, integrating all four of Hofstede's dimensions along with Trompenaars' monochronic/polychronic time dimension and Hall's high-context/low-context communication dimension is likely one of the most ambitious attempts at integrating this type of cultural analysis into IT research (Zakour 2004).

It is important to understand that Hofstede's cultural values dimensions were devised for the national culture level and can realistically be applied to only that level of analysis. However, some researchers have refined Hofstede's dimensions to allow them to apply to individuals without invoking an ecological fallacy. Srite and Karahanna (2006) argue that individuals espouse national cultural values to differing degrees. Dinev et al. (2008) found support for their previous model such that cultural factors play a significant role in the formation of user attitude and behavior towards using protective information technologies. Cohen (2007) found it important to define cultural contexts in terms of both membership in a cultural group as well as perceived, subjective cultural beliefs, especially in countries comprised of diverse ethnic groups. Dorfman and Howell (1988) point out that the UA dimension is actually composed of three seemingly disparate constructs: levels of perceived stress, length of time an individual believes he will work for the present company, and beliefs about whether rules should be broken. Rather than being a discrete and largely independent dimension, it is dynamic. What facet of UA achieves salience at a particular time for a particular individual is variable and context-dependent. While there is evidence to support the application of national cultural values dimensions, none of the dimensional models of culture should be taken as categorical absolutes that apply to all individuals in a given context.

ITP ANALYSIS

In this section I analyze the cultural values dimensions in terms of ITP. First, I frame the discussion by considering questions concerning the impact of the dimensions and combinations of dimensions on information systems development (ISD). Then, I devise a table of potential impacts and/or qualities of each dimension in terms of ITP.

Consider the notion of a national culture with high power distance and high masculinity. High power distance in cultures emphasizes strong hierarchy. High masculinity suggests an emphasis on competitiveness. Would cultures with both high PDI and high masculinity be more or less accepting of information technology? They might more readily implement an ERP system that enhances control of information by executive management than they would a GDSS that promotes a more egalitarian process of group decision-making. Similarly, if they perceive the new system as having the potential for competitive advantage, they would be more likely to adopt it. Conversely, cultures that value cooperation (high femininity) and egalitarian social structures (low power distance) might enthusiastically embrace GDSS technologies that facilitate values that provide equal access and control to members of the decision-making group.

Consider uncertainty avoidance: would cultures with high UA more readily adopt or reject new technology? If the IT artifacts are viewed as reducing uncertainty, the former; if viewed as introducing new uncertainty and risk, the latter. How might this type of analysis apply in the field? First, by determining where the culture lies on this dimension, we have a starting point to assess the amount of uncertainty it is likely to tolerate in the face of change. Second, by combining UA with other dimensions, we can also assess the relative strength of UA in relation, for example, to attitudes towards competition (high masculinity) and cooperation (high femininity) to determine the type of need addressed by the technology. Third, by determining the level of UA, designers could develop a better sense of how formal the rules incorporated, into a GDSS for example, would need to be. Such analysis might also work for Knowledge Management Systems and incorporating formal rules for contributing to it. Combined with an assessment of the IC dimension, anonymous contributions might not be of concern at all in individualistic cultures since members prefer their knowledge and contributions to be recognized by others.

The use of Hofstede's dimensions to assess the cultural geographies of designer and client depends strongly on the context. The design context is bounded by considerations regarding ITP. Therefore, in the visual framework portrayed below, ITP considerations are clustered for each cultural values dimension portrayed. The advantage to this framework is that it can be expanded to include other dimensions at the organizational as well as national cultural levels. Much of the research, cited above, that has applied Hofstede's and others' dimensions discusses their impact or relationship with a variety of situations and technologies. The analysis offered in Table 2 is a novel synthesis of that diverse research that

integrates and clusters ITP dimensions with four of Hofstede's dimensions. Based on the limited discussion above and the literature cited in the previous section, Table 2 describes the potential impact and/or quality for each ITP cluster along each dimension:

	Information	Technology	People
Power Distance Index (PDI)			
High	Information restricted or displayed to reflect hierarchical values; top-down directives; participative IS development inappropriate	Reinforces strict hierarchies and concentration of power; rules for strict access encoded into technology; eschew power-reducing technologies; increased control of IS development by management; less distributed architecture	Strict hierarchical social organization; professionalism and expertise emphasized
Low	Information shared; preference for participatory methods where information flows freely	Disperses power and fosters participation of all members	Egalitarian social structure with flattened hierarchies
Individualism/Collectivism (IC)			
Individualistic	Private information should be guarded, but other information should be accessible to all	Foster individual expression; personalization of interface	Individual autonomy expected and encouraged; individual recognition desired
Collectivistic	Easier to initiate revising of processes, but more difficult implementation; private information may not be of concern	Foster group harmony; enable collective action and play (in service to group goals); more risk-taking possible because of diffused responsibility	Group cohesion favored; sublimation of individual desires
Masculinity/Femininity (MF)			
Masculinity	Job content important	Enhance gender-related roles; implementation of IS fails without matching culture	Pay security; competitiveness; material success
Femininity	Quality of life important	Enhance quality of life	Nurturing relationships; physical conditions
Uncertainty Avoidance (UA)			
Strong	Reliable, predictable, lots of rules; more tied to cultural traditions; fewer long-term goals/plans; more formal rules for videoconference meetings	Enhance predictability and security; resistance to new applications or systems; increased employee responsibility for implementation; IS focus on automation; restricted access to systems; prefer richer communication media	Threatened and stressed by unknown situations; need for employment stability
Weak	Information richness valued; process revisions viewed as challenges to be solved	Novel systems and software embraced provide new challenges	Unconcerned about predictability; views life as inherently uncertain
Table 2. Hofstede's Cultural Values Dimensions Impacts on ITP			

DISCUSSION OF DESIGN IMPLICATIONS

Dillon (1998) examined the use of cultural analysis in the design process and to what extent a deep social science methodology can influence the process of technology design. While acknowledging that ethnography skills aren't easily assimilated by designers as a tool for understanding users, he suggests that it can be useful at the earliest stages of design and could serve as context builders to support user and task analysis. Cultural analysis and ethnographic methodologies,

when combined with other social science methodologies, can provide a powerful framework for design whereas alone they are of limited use to designers.

When using Hofstede's dimensions to assess the "cultural geography" of the target audience for a new information system, or even for the analysis of existing systems, it is important to remember that they are integrated and contextual (Dinev et al. 2008). A measure of high Power Distance, for example, may be mitigated by or have less impact with a measure of high Femininity when combined in the same culture. Individualistic cultural values may combine with high Power Distance to create a system that has strict control over information access (the PD value) while allowing for extensive personalization (the Individualistic value) of the interface that enables individual choice in how the information is displayed. While the cultural values dimensions can be used separately in an analysis, doing so provides a more limited picture of the target population and limits the efficacy of the analysis and the development of the system. The same holds true for the clustering of ITP dimensions. How does a designer begin to assess this cultural geography? A visual integration of the dimensional continua might look like Figure 1¹ below.

¹ This visual representation is only one possible configuration for illustrating the integration of cultural values dimensions. In addition, it only considers Hofstede's first four dimensions, neglecting the LTO, Indulgence/Restraint, and Monumentalism/Self-Effacement dimensions.

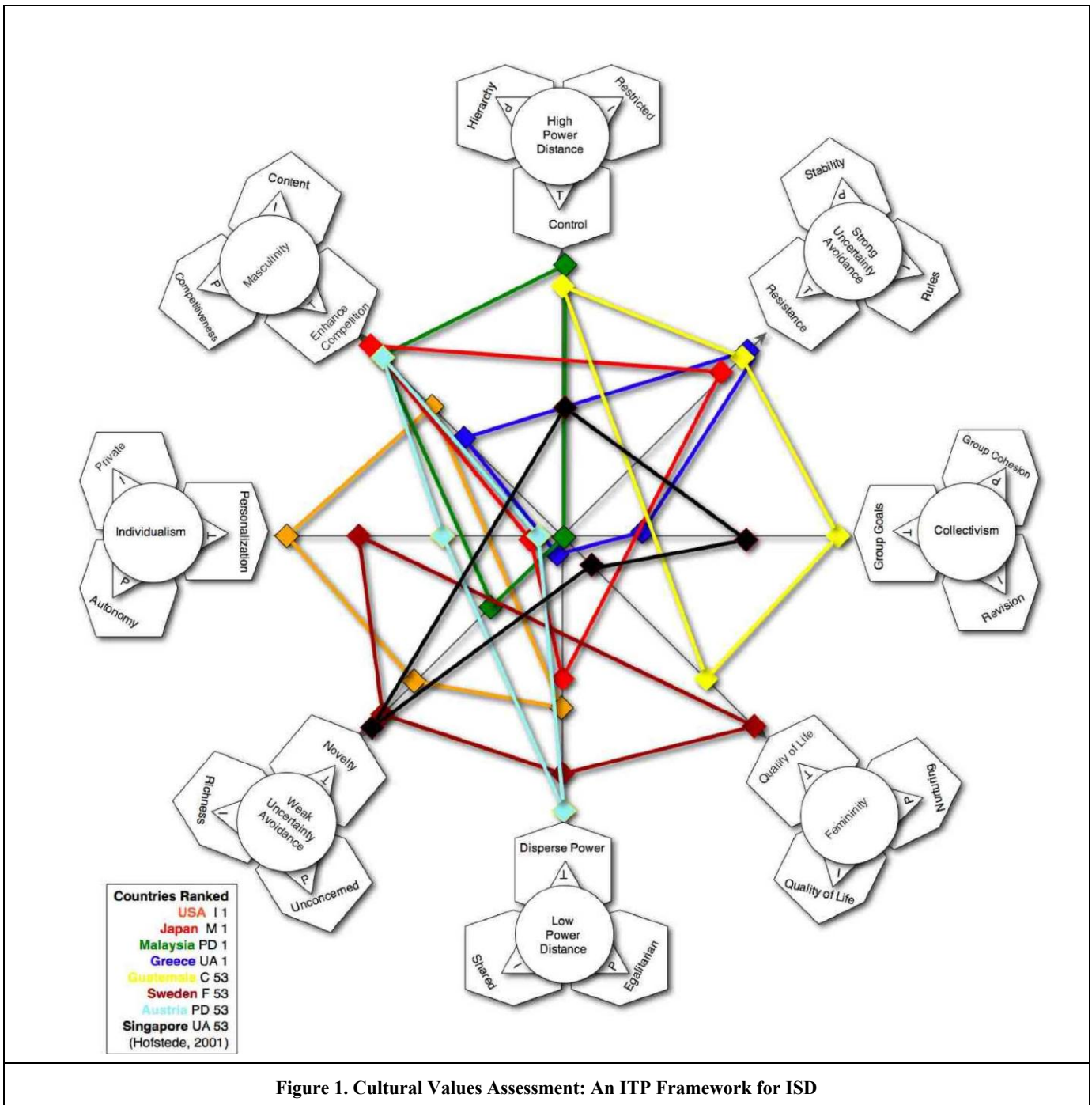


Figure 1. Cultural Values Assessment: An ITP Framework for ISD

Figure 1 plots countries² by relative ranking according to the scores they received in Hofstede’s initial survey of IBM employees as examples. The figure reflects the fact that ITP viewed through a cultural lens forms clusters that are interdependent, and suggests that designers consider them as clusters in relation to the dimensions. The qualities or concerns listed for each cluster element are keyword heuristics that should be supplemented by the longer descriptions in Table 2. Because the rankings are relative, the designer can visualize where his cultural geography lies relative to the population for whom he is designing. The figure is not meant to be a definitive calculator, rather a guide to begin the assessment process and illustrate the “cultural distance” between the designer and client. Cultural values are complex

² The eight countries plotted are those ranked at the extremes of each dimension, having received a ranking of 1 or 53 (highest or lowest) in Hofstede’s analysis Hofstede, G. *Culture’s Consequences: Comparing Values, Behaviors, Institutions, and Organizations Across Nations*, (2nd ed.) Sage Publications, Thousand Oaks, CA, 2001..

and emergent entities, and the framework proposed here can only be used as a starting point for the cultural analysis to be performed.

A US designer, whose culture scores highest in individualism, should understand from the guide that their cultural preferences will bias their design in favor of autonomy of the individual and their concomitant responsibility for revisions of information content, the ability to personalize the technological interface, and the ability to keep an individual’s information private while allowing open access to other information and knowledge. When designing for Guatemalan or Singaporean clients, the US designer needs to consider that personalization of the interface is likely to be less important than a single interface that fosters harmony of process among users, that the technology must prioritize the accomplishment of group goals, and that it is preferable to track revisions of information content at a group rather than individual level so as to reinforce the collectivist nature of the culture. The US designer’s moderately high Masculinity score will bias their design in favor of focus on information content rather than context, and lead them to believe that the technology is to be used to enhance the competitive edge of the organization using it, which is a natural outgrowth of the general competitiveness inherent within people. When designing for Swedish or Guatemalan clients, the US designer needs to consider that competitiveness is not as valuable as nurturing among the users, who are more interested in technology and information content that enhances their quality of life and prioritize such enhancement over material gain or advancement. At the same time, there is more of a convergence between US and Swedish cultures in terms of individualism, such that they are more likely to value interface personalization, and technologies that allow for autonomous action by individuals and allows for restrictions on an individual’s information but allowing more open access to other information.

Although this brief example discusses only a couple of the dimensions of a US designer to clients in a few other countries, it provides insight into the complexity of the design process when conducted across cultural boundaries. This complexity is revealed through the clustering of information, people and technology in terms of each national cultural dimension. For example, information considered in terms of IC focuses on differences in terms of privacy vs. open access and individual vs. group responsibility for revision to content, whereas information considered in terms of MF focuses on how information is put to use—as a competitive tool for advancing material prosperity or as a foundation for enhancing the quality of life.

LIMITATIONS OF THE FRAMEWORK

Because the cultural values dimensions incorporated in the figure are dimensions derived from the national culture level of analysis, they do not always fit with organizational culture or individual personality trait assessments. Organizational culture, for example, has different salient dimensions. Researchers have approached the issue of describing organizational cultures with a variety of perspectives and have described organizational structures in terms of power differentials (Weisbord 1976), personality types (Handy 1978; Harrison 1972; Kets de Vries and Miller 1987), behaviors and processes (Robbins 1989), shared beliefs and assumptions (Schein 1992), and system dynamics (Senge 1990). Hofstede (1991) derived six dimensions from his subsequent research and which only match partially with national culture dimensions. Hofstede and McCrae (2004) discovered a distinct pattern of associations between personality traits of the Five-Factor Model (Digman 1990) with national culture dimensions, but again only a partial correlation. Without delving into the detail of these dimensions and what they mean, the table below illustrates how the various levels of analysis match up.

National Culture Dimensions	Correlating Organizational Dimensions	Correlating Personality Dimensions
Power Distance	Process Oriented vs. Results Oriented	Agreeableness
Individualism-Collectivism	Parochial vs. Professional	Extraversion
Uncertainty Avoidance	Parochial vs. Professional; Open System vs. Closed System	Neuroticism
Masculinity-Femininity	(none)	(none)
<i>Uncorrelated Dimensions</i>	<i>Employee Oriented vs. Job oriented; Loose control vs. Tight control; Normative vs. Pragmatic</i>	<i>Openness to Experience; Conscientiousness</i>

Table 3. Correlations between National Culture, Organizational Culture, and Personality Trait Dimensions

FUTURE RESEARCH

There are three directions for future research related to this proposed framework: the incorporation of other cultural dimensions, contrasting the framework with the already established Value Sensitive Design framework, and empirical testing and validation with different cultural groupings. Because many information systems are designed for organizations rather than people of a particular culture, an analysis of organizational culture dimensions and their

relationship to this relativist framework needs to be pursued. This proposed framework rests on a relativist ethical foundation, in contrast to the deontological foundation upon which Value Sensitive Design (Friedman 2004; Friedman and Kahn 2003) is based. Further exploration of the list of "universal human values" claimed by VSD, as well as its deontological ethics, and how they contrast with this relativist framework and its relativist ethics is required. Finally, empirical testing and validation of the framework needs to be undertaken at national and organizational culture levels. One possible avenue for this testing and validation exists in the development of information systems for humanitarian relief organizations that operate across national boundaries and have IT coordination bodies that span organizational boundaries. Such bodies develop systems not only for users within different national culture contexts but also for themselves as members of an IT subculture across organizations, both of which could provide fruitful validation populations for the framework.

CONCLUSION

Hofstede's dimensions have been shown to be remarkably stable across national cultural boundaries. Further research has demonstrated overlap and linkages between national and organizational levels. Recent research has shed light on the links between national culture and individual personality traits. Cultural analysis provides a vehicle to situate individuals in a variety of informational, technological, and social contexts. Exactly what schemas are evoked varies according to context and experience, but there is enough overlap between individuals to allow for communication and common frames of reference. This makes sense if we consider that cultural schemas are the shared individual cognitive schemas.

The examination of cultural values has the potential to provide an integrative analytical framework for the design, implementation, and use of IT on individual, group, organizational, and national levels. Developing an integrative framework for the successful design of information systems in a global context requires that Information Science and Technology professionals, researchers and designers understand their own cultural assumptions and values and be able to assess others' values within an ethnorelativist framework.

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